

## THE PERCEPTION & ATTITUDES OF SMES MANAGERS TOWARDS E-COMMERCE IN SOUTHERN ALGERIA: WITH SPECIAL REFERENCE TO THE GHARDAIA COUNTY

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### ABSTRACT

An empirical study has been conducted by authors in the Wilaya (County) of Ghardaia (Southern Algeria) with the ultimate aim of surveying the local SMEs managers' perception and attitudes towards e-commerce.

It seems that, these managers' perception and attitudes are on the whole positive. However, due mainly to poor endowment in material and technical factors as well as the environment inadequacy either economically, financially, institutionally and legally those SMEs cannot adopt currently E.C. solutions.

Unfortunately, it follows a "Digital Marginalisation" and a failure when it comes to take up the challenge of "becoming global" for the studied SMEs.

### KEY WORDS

E-commerce, SMEs, ICT, Perception, Attitudes.

### CODE JEL M15

### INTRODUCTION

Small-to-Medium sized Enterprises (SMEs) represent more than 95% of all businesses worldwide, employ two thirds of the labour force, and provide roughly the same proportion of the GDP on an international level.<sup>1</sup> According to a January 2008 Nielson Global

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<sup>1</sup> See : Essentials, small and medium enterprise development, UNDP 1999.

Online Survey more that 85% of the world's online population has used the Internet to make a purchase. In 2006, 627 million had shopped online, in 2008, the number was 875 million. This was an astounding increase of 40% in only two years. Nielson reports that in the preceding month more than half of global online users bought something online. Prolific shoppers resided in South Korea, United Kingdom, Switzerland, and the United States.<sup>2</sup>

If it is well known that SMEs both economically and socially are the driving force behind any development and growth, the benefits (shortcomings) derived from ICT (Information & Communication Technology) are however less tangible.

This paper is about how can the perception and attitudes of SMEs managers in less-Developed countries help in preparing these small entities to embark on the digital era and eventually profit from the ICT advantages? The main issues at stake in this research can be summarised as follows:

1. How can SMEs managers respond to the adoption of e-commerce solutions by their organisations?
2. What are SMEs managers perceptions and attitudes towards e-commerce adoption by their SMEs?
3. How can SMEs benefit from e-commerce solutions

As for the methodology adopted in carrying out this research, the conceptional bit reposed on a thorough review of the related literature while the empiric part was based on conducting a survey.

At the end, the results proved the validity of the main and sub-hypothesis put forward from the beginning i.e. that SME managers in the Ghardaia county are aware of the concept of e-commerce as well as of its importance for their businesses. Then, it was found that SME managers attitudes towards e-commerce in the Ghardaia county are on the whole positive.

Finally, authors managed to detect a strong and positive correlation between SME managers attitudes towards e-commerce and their level of satisfaction about its implementation in their businesses.

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<sup>2</sup> See : <http://www.access-ecom.info/article.cfm?id=85&xid=MN>

## 1 - THEORETICAL BACKGROUND

The literature is abundant when dealing with the impact of ICT in general and the internet in particular on SMEs especially with the advent of Globalisation sweeping through. A lot of work have been done either theoretically and empirically in order to see how SMEs can derive advantages from the "New Technologies" not to name the E-commerce.

Perhaps, due to internal factors most of the work done in this particular field has to be found in few middle-sized developed countries such as Australia, Canada & Britain. We will try to present but few of the latest studies which focus on the perception and attitudes of SMEs managers towards the E-commerce adoption in those countries.

Although, the interest into SMEs can be traced back only to the eighties of the last Century, Schumacher's (1973) best-seller "Small is Beautiful" is indeed a landmark. In addition to the virtues of earth conservation and ecology, small in all its dimensions is prone in contrast to the Gigantism of Multinationals and Imperialism.

George Rodriguez (2002) found that SMEs can survive better in an ever-changing environment since its small size provides it with a non-formal and efficient communication network. The latter makes the SME respond rapidly to any market change and perform easily internal mutations.

Rothwel (2002) indicated that SMEs in general lack either time or resources capable of determining external technological expertise. Most of them cannot respond adequately to legislation and complex trade procedures.

Mc Kinsey & Co (2001) coined the term "Born Global Firms" to call those International SMEs which are born global. They are characterised by their emphasis on international markets and found their strategies about the competitive advantage built on knowledge. Hence providing highly value-added products & services. Some of the existing SMEs are Born-again in that sense that they switch suddenly to an internationalisation of their activities on the world market.

Knight (2001) has found that more SMEs from Asia, Europe & North America become familiar with the International Trade. Although, more work is needed to investigate SME's move towards

globalisation outside the traditional export-oriented activities, there is still now a clear option for those entities to embark on international activities.

It is now well established that innovation is at the heart of any effort to overcome competition through what has been called "the competitive advantage" either in order to cater for the ever-increasing demand for new products or for the upgrade of existing ones.

Myers & Marquis (1969) insisted on the integrality of the processes involved in innovation which goes beyond only the conception of neither new ideas, nor the invention of new devices, nor the development of new markets.

Kimberly (1981) has found that innovation is seen socially as positive hence it is preferred and encouraged.

Drucker (1985) believes that the best way, if not the only in a world of rapid change to success is innovation which can transform these mutations into opportunities. As for SMEs, their outward orientation means that globalization is not only penetrating exterior markets.

It is also, as Jones (2001) has found, the extent to which SMEs are affected by these international effects as well as by opportunities and threats involved.

Some authors such Mc Gauphey (1997) concentrated on managerial effects which are brought about with globalization especially as far as exports are concerned. One of the interesting findings of these studies was that the SME owner/manager characteristics such as his education level, his attitudes, and his personal relations can play a prominent role in initiating the globalization move and its maintaining.

The extraordinary leap into ICT and its ever-increasing velocity in developing countries over the last two decades has profited to companies in many ways. Among these advantages occurring to the developed countries companies, we can cite but few:

1. Use of E-mail in communicating with others,
2. Ownership of a web site for information, advertising and publicity purposes,
3. B2C (Business to Consumer),
4. B2B (Business to Business).

The vast literature on IT (Information Technology) appropriation researched the possible factors which might affect technology applications. Some of these factors are linked to behaviour characteristics such as perceptions and attitudes. Others are linked to the economic nature of the company like its size, the ROI, and the degree of competition.

Davis (1989) proposed a model called "Technology Acceptance Model" in which he concentrated on the adoption, the application, and the dissemination of technology on the basis of the applicant's perception of technology easiness and advantages.

Ajzen (1991) discussed technology in the light of the "TPB" theory which considers behaviour as a direct function of behaviour intentions and behaviour perception control. He suggested that self-values (social factors) may help in intentions forming.

Taylor & Todd (1995) proposed an alternative theory "DTPB" which tries to overcome the latter shortcomings. They pruned an e-forming of beliefs based on values, non-attitudes, and control in order to become multi-dimensional.

The problem with this kind of constructs, thus theories is its sole concentration on psychological factors which can influence the acceptance/adoption/use of technology. They occult defacto any internal/external other factors inherent to the organization such as the economic and legal aspects, the size, the sector...etc. Fortunately enough, recent literature addressed the issue of small businesses appropriation of technology particularly the Internet and its applications.

Dandgige & Levenburg (1998) have found that the internet is giving SMEs important marketing advantages. They have also reached the conclusion that the increasing size of the SMEs (labour force) leads to higher usage of Internet.

In another study, Piovesana & Rauch (1998) pointed out to the fact that the unaffordable costs of some technologies related to Internet such as E-commerce may be an obstacle to SMEs adoption of these technologies.

Fielding (1996) confirmed this point of view when stating that SMEs may find Internet Technologies such as EDI very complicated, difficult to apply and very costly.

Lawrence (1997) listed many factors which are thought to obstruct the process of E-commerce adoption by small businesses

These are:

1. Weak level of existent equipment,
2. Limited resources,
3. Urgency of rapid ROI,
4. Resistance to organizational change,
5. Scarcity of available information,
6. Preference for traditional conduct of businesses.

In the same framework McGowan & Mady (1998) conducted an extensive survey which has led them to conclude that the adoption/application of Internet technologies is subject to some determinant factors. These are principally the size of the company, its available resources and the level of technical knowledge.

In an exploratory study done in the United States, O'Conner et al (1997) have found that SMEs Managers/Owners are in general optimistic regarding the use of Internet. They believed that the average use of Internet would be stable at this level if not increasing in the future. However, when it comes to the adoption of technologies by small industries some hesitation is noticeable.

Parish(1998) reached an interesting finding concerning Internet adoption by SMEs. Small businesses despite their lack of enough resources and the necessary experience are increasingly selling through the Internet. However, if it is meant by the use of Internet owning its proper website, the proportion of SMEs did not exceed 20%.

Finally, Van akkeren & Cavaye (1999) grouped the possible factors influencing the Internet adoption by SMEs into broad categories which are:

1. Owner/ Manger characteristics,
2. Organization characteristics,
3. ROI.

## **2 - THE STUDY**

### **2.1 - The Problem**

The main issues at stake in this research can be summarized as follows:

4. How can SMEs managers respond to the adoption of e-commerce?

5. What are SMEs managers perceptions and attitudes towards E-commerce adoption by their SMEs?
6. How can SMEs benefit from E-commerce solutions?

We were concerned about tackling these issues in a developing Arab country Algeria and especially in Ghardaia County.

## **2.2 - Importance of the study**

The importance of the research stems from the threefold argumentation:

1. SME's increasingly leading role in development.
2. The importance of ICT in general and E-commerce in particular for SMEs.
3. The importance of regional and local Micro studies in depicting the whole image.

To our knowledge it may be the first such research in the region about the adoption of E-commerce.

## **2.3 - Hypothesis**

The main hypotheses of the research are :

- SMEs Managers/Owners in Ghardaia County have a positive perception about E-commerce and its importance for SMEs.
- SMEs Managers/ Owners in Ghardaia County have a positive attitude towards E-commerce.
- There is a strong and positive correlation between SMEs Managers/Owners attitudes in Ghardaia County towards E-commerce and their satisfaction as regards to its adoption in their companies.
- SMEs Managers/ Owners attitudes in Ghardaia County towards E-commerce are morally influenced by some intrinsic demographic variables which are linked to their: education level, professional Specialism, gender, age and previous experience.

## **2.4 - Research main Objectives**

The main objective is to study and measure the perception of SMEs Managers / Owners in Ghardaia County (Algeria) of E-

commerce as well as their attitudes concerning the application and solutions of E-commerce.

### **2.5 - Research Methodology**

Depending on the issues covered by the study, the appropriate methodology will be applied. On the whole, the first part will need a descriptive approach while in the second one we will use an analytical framework since it is based on an empirical research. Ultimately the third part will lead to a modelling attempt.

### **2.6 - Sample and Information gathering**

The research will concern the total number of SMEs in the Wilaya (county) of Ghardaia which amounts to 222 despite the fact that some of them were at the time of the research (2000 – 2003) out of activity for many reasons.

A sample of 50% i.e. 111 SMEs will be retained by the researcher because thought to be enough representative of the characteristics of the small business community in the region.

Anticipating the fact that a fair number of SMEs may not respond, 160 questionnaires have been dispatched to SMEs in the County. The dispatching have been followed by a twice remainder as well as by at least one visit.

Fortunately enough, 120 forms have been returned from which 18 incomplete have been cancelled which leave us with 102 accepted forms to be taken into consideration for analysis in the study.

### **2.7 - Questionnaire**

In order to gather the necessary information for the research a Questionnaire was constructed and sent to Ghardaia's SMEs managers. Most questions were intended to survey SMEs managers perception and attitudes towards E-commerce in that region. (see appendix No1)

Eventually, the Questionnaire contained 66 interrelated questions dealing with 3 major areas which are:

- Computers and the Internet,
- E-commerce,
- Demographics



Two prominent specialists were asked to review the Questionnaire items and their remarks have been incorporated into the final version.

## 2.8 - Research constraints and limitations

As most researches, ours is no exception regarding a certain number of constraints which are imitating the scope as well as the generalization of results. These limitations can be summarized as follows:

- SMEs definition and classification: based on the Algerian legal definition,
- Criteria for SMEs Definition : based on the workforce size,
- Period of study: 2000 – 2003,
- Place of study: Ghardaia County (Wilaya),
- Legal status of SMEs : private PLCs.

## 3 - FIELD STUDY:

### 3.1 - Testing the main hypothesis validity

#### Hypothesis N° 1:

*"SMEs managers in Ghardaia County perceive the meaning and importance of e-commerce."*

K square variables and those concerned with T analysis were separated in the course of proofing Hypothesis No1 in the light of the statistical nature of both of them. Please refer to Table 1 for Hypothesis No1 verification where a separation between the meaning and the importance of e-commerce concept is spelled out.

Table N 1:

N°	Variables	Perception Recurrences	Non perception Recurrences	K square
1	The existence of e-commerce concept	55	46	0.80
2	The meaning of e-commerce concept	32	23	1.473
3	The existence of differences between e-commerce & e-marketing	29	26	0.164
	Average	39	32	1.014

Concerning the analysis depth, authors will perform the necessary two analysis whether on a global basis or in-depth. Globally, authors

believe that SMEs managers in Ghardaia County perceive positively the concept of e-commerce.

When it comes to more details, those who expressed their perception of e-commerce concept (55) exceeded those who do not (46). The calculated value of K square was 0.80 (The tabular value is 0.004 with a level of reliability at 95%) which confirms the existence of meaningful differences for this part of analysis.

Concerning the variable related to the perception of the meaning of e-commerce, again we find that those who perceived the meaning (32) exceed those who do not (23). The calculated K square was 1.473 (The tabular value is 0.004 at a level of reliability at 95%) which confirms the existence of meaningful differences for this part of analysis.

Finally, the perception of differences between e-commerce and e-marketing was noticeable since the majority of surveyed managers (29) perceived the differences while only 26 do not.

The calculated value of K square was 0.164 (The tabular value is 0.004 with a level of Reliability of 95%) which confirms the existence of difference proof for this part of analysis. K square calculated total value amounts to 1.014 (the tabular value is 0.004 at a level of Reliability of 95%) which proves that statistically Hypothesis No1 is valid.

Table N° 2:

Question N° 4: The importance of e-commerce for your Business	Mean	T test	Std Deviation
1 – For Profit increase	2.2909	3.281	0.6575
2 – In Cost reduction	2.2182	2.194	0.7376
3 – In more internal integration	1.6909	3.457	0.6631
4- In Customers satisfaction	2.4364	4.707	0.6876
5 – In production boosting	1.7091	3.149	0.6851
Average	2.0691	8.551	0.6861

It appears from table No2 that SMEs Managers in Ghardaia County perceive on average the importance of e-commerce for their businesses. One can also conclude that Hypothesis N°1 is valid statistically since T value exceeds 0.05.

Globally, after the usual statistical verification that the differences in answers are not due to coincidences but can be traced back to objective reasons pertinent to the phenomena being studied here,

authors confirmed that SMEs managers in Ghardaia County on the whole do perceive the concept and importance of e-commerce.

### Hypothesis N° 2:

*"Attitudes of SMEs managers in Ghardaia County towards e-commerce are positives".*

Table N° 3

N°	Proposition	Mean	T test
1	The availability of physical, human and technical means is necessary to adopt e-commerce applications	2.8182	13.974
2	Public & Private sectors ought to cooperate in order to encourage the adoption of e-commerce solutions by SMEs	2.4727	6.122
3	e-commerce wins over the traditional trade in the majority of sectors.	2.2545	3.231
4	The adoption of e-commerce leads to higher performances due to overcoming traditional trading shortcomings	2.6909	10.156
5	e-commerce needs financial resources which exceeds SMEs capabilities	2.1636	1.922
6	e-commerce solutions adoption leads to more profits & sales	2.6545	9.388
7	e-commerce solutions adoption leads to an increase in market share and winning over competition	2.5455	6.391
8	e-commerce solutions adoption leads to product quality amelioration and business high performances in general	2.8000	13.266
9	Technical problem and lack of technical support are obstacles to the adoption of e-commerce solutions by SMEs	2.6545	9.388
10	e-commerce legislation is a condition to its adoption	2.3091	3.612
11	The lack of an electronic efficient and secure payment system is an obstacle to the adoption of e-commerce	2.3455	4.165
12	The nature of the product and customers do not allow the adoption of e-commerce	2.4364	5.382
13	e-commerce contributes to marketing improvement, customers servicing and winning over competition	2.7636	12.050
14	e-commerce contributes to cost reduction, stock and inventory management improvement	2.7636	11.151
	Overall average	2.54	7.144

Table N° 3

N°	Proposition	Std Deviation
1	The availability of physical, human and technical means is necessary to adopt e-commerce applications	0.4342
2	Public & Private sectors ought to cooperate in order to encourage the adoption of e-commerce solutions by SMEs	0.5727
3	e-commerce wins over the traditional trade in the majority of sectors.	0.5843
4	The adoption of e-commerce leads to higher performances due to overcoming traditional trading shortcomings	0.5045
5	e-commerce needs financial resources which exceeds SMEs capabilities	0.6314
6	e-commerce solutions adoption leads to more profits & sales	0.5170
7	e-commerce solutions adoption leads to an increase in market share and winning over competition	0.6330
8	e-commerce solutions adoption leads to product quality amelioration and business high performances in general	0.4472
9	Technical problem and lack of technical support are obstacles to the adoption of e-commerce solutions by SMEs	0.5170
10	e-commerce legislation is a condition to its adoption	0.6346
11	The lack of an electronic efficient and secure payment system is an obstacle to the adoption of e-commerce	0.6152
12	The nature of the product and customers do not allow the adoption of e-commerce	0.6013
13	e-commerce contributes to marketing improvement, customers servicing and winning over competition	0.4700
14	e-commerce contributes to cost reduction, stock and inventory management improvement	0.5079
	Overall average	0.5478

Table N°3 summarizes attitudes results which can be analyzed as follows:

Globally, it appears from the above table that SMEs managers in Ghardaia county have positive attitudes towards e-commerce. It can be also concluded that Hypothesis No2 is valid statistically sine the

value of T is superior to 0.05 which confirms the validity of this hypothesis related to SMEs managers attitudes.

Now going into more details, it can be noticed that the highest value of any attitudes variable is variable no1 with 46 recurrences and a T value at 13.974. The lowest value however is represented by variable no5 where T value is 1.922.

Concerning variable No1 which relates to the availability of physical means, the mean was 2.47 while the forecasted is 2 i.e. a positive deviation of 0.47 and a T value of 13.97. One can conclude that the study's elements attitudes were positive which confirms partially Hypothesis no2.

As for variable No2 which concerns the cooperation between the private and the public sectors, the mean was 2.81 as compared to the forecasted 2 i.e. a positive difference of 0.81. with a T value at 6.12 , it seems that here also attitudes were positive which confirms partially Hypothesis No2.

Concerning Variable N°3 which relates to e-commerce supremacy, the mean was 2.25 as contrasted with the forecasted value of 2 i.e. a positive difference of 0.25 and a T value of 3.23. One can draw from the above mentioned figures that the study's elements attitudes were positive which confirms partially Hypothesis No2.

As for Variable No4 which relates to business performance boosting, the mean was 2.69 as contrasted with the forecasted value of 2 i.e. a positive difference of 0.69 and a T value of 10.15. One can draw from the above mentioned figures that the study's elements attitudes were positive which confirms partially Hypothesis No2.

Concerning variable No5 which relates to the necessity of financial resources availability, the mean was 2.16 while the forecasted is 2 i.e. a positive difference of 0.16 and a T value of 1.92. One can conclude that the study's elements attitudes were positive which confirms partially Hypothesis No2.

As for variable No6 which concerns the increase in sales, the mean was 2.65 as compared to the forecasted 2 i.e. a positive difference of 0.65. With a T value at 9.38, it seems that here also attitudes were positive which confirms partially Hypothesis No2.

Concerning variable No7 which relates to the increase in market share, the mean was 2.54 while the forecasted is 2 i.e. a positive difference of 0.54 and a T value of 6.39. One can conclude that the

study's elements attitudes were positive which confirms partially Hypothesis No2.

As for variable No8 which concerns financial resources, the mean was 2.80 as compared to the forecasted 2 i.e. a positive difference of 0.80. With a T value at 13.26, it seems that here also attitudes were positive which confirms partially Hypothesis No2.

Concerning variable No9 which relates to technical problems, the mean was 2.65 while the forecasted is 2 i.e. a positive difference of 0.65 and a T value of 9.38. One can conclude that the study's elements attitudes were positive which confirms partially Hypothesis No2.

As for variable No10 which concerns legislation enacting, the mean was 2.30 as compared to the forecasted 2 i.e. a positive difference of 0.30. With a T value at 3.612, it seems that here also attitudes were positive which confirms partially Hypothesis No2.

Concerning variable No11 which relates to the absence of payment system, the mean was 2.34 while the forecasted is 2 i.e. a positive difference of 0.34 and a T value of 4.165. One can conclude that the study's elements attitudes were positive which confirms partially Hypothesis No2.

As for variable No12 which concerns product and customers nature, the mean was 2.43 as compared to the forecasted 2 i.e. a positive difference of 0.43. With a T value at 5.382, it seems that here also attitudes were positive which confirms partially Hypothesis No2.

Concerning variable No13 which relates to the marketing improvement, the mean was 2.76 while the forecasted is 2 i.e. a positive difference of 0.76 and a T value of 12.050. One can conclude that the study's elements attitudes were positive which confirms partially Hypothesis No2.

As for variable No14 which concerns costs reduction, the mean was 2.76 as compared to the forecasted 2 i.e. a positive difference of 0.76. With a T value at 11.151, it seems that here also attitudes were positive which confirms partially Hypothesis No2.

From the in-dept analysis, it seems that Hypothesis No2 was valid for all 14 attitude variables which in turn confirms the hypothesis validity on both the global and detailed analysis.

**Hypothesis N° 3 :**

*"There is a positive & strong correlation between SMEs managers attitudes in Ghardaia county towards e-commerce from one side and their satisfaction about its adoption from the other side."*

In order to proof the above-mentioned Hypothesis authors perform the followings:

- Step 1:* Distributing all neutral recurrences (2) appearing in table no3 equally between the column containing recurrences approving (3) and the column containing recurrence disapproving so as to have a table made of only two columns.
- Step 2:* For question No15, relating to the level of managers' satisfaction about e-commerce adoption, merging recurrences of answers fully dissatisfied (1) with those of dissatisfied (2) as well as merging recurrences of answers fully satisfied (5) with those of satisfied (4).
- Step 3:* Distributing recurrence of neutral answers for the same question no15 equally between recurrences of satisfied and dissatisfied so as to obtain a two columns only table.
- Step 4:* Calculating the average of each case (form) out of 55 for variable from No19 to No32 i.e. those variables related to SMEs managers attitudes in Ghardaia County towards e-commerce as well as for variable no33 which concerns the level of satisfaction about the adoption of e-commerce in the same SMEs.
- Step 5:* Building table 4
- Step 6:* Filling table no4 with all averages calculated according to above-mentioned Step 4 which constitutes Table No5.
- Step 7:* Calculating the Contingency Coefficient according to the following formula:

Table N° 4

Attitudes	Positive	Negative	Total
Satisfaction			
Satisfied	A	B	
Dissatisfied	C	D	
Total			

Table N° 5

Attitudes	Positive	Negative	Total
Satisfaction			
Satisfied	A 12	B 0	12
Dissatisfied	C 42	D 1	43
Total	54	1	55

$$\text{Contingency Coefficient} = (AD-CB)/(AD+CB)=1$$

Since the value of the Contingency Coefficient should be always equivalent to 1 which is superior to 0.50, therefore there a strong & positive correlation between SMEs managers attitudes towards e-commerce and their satisfaction about its adoption in their businesses. Hence the confirmation of Hypothesis No3.

#### Hypothesis N° 4:

"Attitudes of SMEs managers in Ghardaia County towards e-commerce would be positively influenced by a number of related demographic variables."

We can spell out the above-mentioned hypothesis as follows:

- 1- Attitudes of SMEs managers in Ghardaia County towards e-commerce would be positively influenced by their level of education.
- 2- Attitudes of SMEs managers in Ghardaia County towards e-commerce would be positively influenced by their gender.
- 3- Attitudes of SMEs managers in Ghardaia County towards e-commerce would be positively influenced by their previous experience.
- 4- Attitudes of SMEs managers in Ghardaia County towards e-commerce would be positively influenced by their professional Specialism.
- 5- Attitudes of SMEs managers in Ghardaia County towards e-commerce would be positively influenced by their age.



In order to test the validity of this hypothesis, we will summarize in table no6 SMEs managers answers recurrences related to demographics.

Variables	Attitudes	Recurrences		K square
		Positive	Negative	
1- Education	A	B		
Primary/Mid	11	10		Calculated 17.52
Secondary	11	21		
University	33	16		Tabular
Total	55	47		0.10
2- Professional Specialism	A	B		
I.T. Specialist	6	5		Calculated 3.60
I.T. Non-Specialist	47	44		
Total	53	49		Tabular 0.004
3- Gender	A	B		
Males	54	47		n.a (No statistical significance)
Females	1	0		
Total	55	47		
4- Age	A	B		
Below 40 years	14	25		Calculated 8.18
40 years & beyond	41	22		
Total	55	47		Tabular 0.004
5 – Insider experience	A	B		
Less than 5 years	5	18		Calculated 14.06
5 years & more	52	27		
Total	57	45		Tabular 0.004

In order to calculate K square autonomous and according to Mahuddin Al Azhari (1993), we will follow these steps:

Step 1: Sum up horizontally all recurrences in columns A and B e.g. we will find for variable n°1:

	A	B	Total
Primary/ Mid School	11	10	21
Secondary School	11	21	32
University	33	16	49
Total	55	47	102

Step 2: Calculate forecasted values for each variable in both cases A & B which leads to the following computation:

**For A:**

$$21/102 \times 55 = 11.32$$

$$32/102 \times 55 = 17.25$$

$$49/102 \times 55 = 26.42$$

**For B:**

$$21/102 \times 47 = 9.67$$

$$32/102 \times 47 = 14.74$$

$$49/102 \times 47 = 22.57$$

Step 3: K square is calculated as follows:

$$\begin{aligned} & (11 - 11.32)^2 / 11.32 + (11 - 17.52)^2 / 17.52 + \\ & (23 - 26.42)^2 / 26.42 + (10 - 9.67)^2 / 9.67 + \\ & (21 - 14.74)^2 / 14.74 + (16 - 22.57)^2 / 22.57 = 17.52 \end{aligned}$$

We do the same for the remaining four variables in order to obtain K square values as shown in the above table. Upon comparison between the two K square values i.e. calculated & tabular we can draw the following conclusions:

1. Concerning variable 1 which relates to the level of instruction (education) of SME managers, and since the calculated value of K square 17.52 is superior to the tabular one (0.10) at a level of reliability 95% therefore attitudes are influenced by the managers level of instruction.

2. Concerning variable 2 which relates to SME managers professional specialism, and since the calculated value of K square 3.60 is superior to the tabular one (0.004) at a level of reliability 95% therefore attitudes are influenced by the managers specialism.

3. Concerning the variable related to SME managers gender, it was deliberately excluded from the statistical analysis since 99% of respondents were males.

4. Concerning variable 4 which relates to SME managers age, and since the calculated value of K square 8.18 is superior to the tabular one (0.004) at a level of reliability 95% therefore attitudes are influenced by the managers age.

5. Concerning variable 5 which relates to SME managers experience, and since the calculated value of K square 14.6 is superior to the tabular one (0.004) at a level of reliability 95% therefore attitudes are influenced by the managers experience.

On the whole, we are left with 4 variables out of 5 which have been proven to influence SME managers attitudes as far as e-commerce is concerned. These are the level of instruction, professional specialism, age, and experience.

One can conclude so far that demographic variables do influence on the reliability of SME managers attitudes towards e-commerce which in itself is a proof of the validity of hypothesis no 4 as well as its five sub-items.

## **4 - MAIN RESULTS**

### **4.1- Preliminary remarks**

SMEs sector in Algeria in general and particularly in Ghardaia is facing a severe crisis due mainly to a deindustrialization phenomena effect. In fact, historically the sector relied heavily on light labour intensive industries especially textiles.

In the last years with the liberalization of markets, cheap fabrics from China and the Far-East have been dumped into the local markets signing defacto the death act of the local textiles sector. SMEs were therefore faced with a twofold dilemma: either withdraw from the marketplace or reinvest in another sector with supplementary costs which is in most cases out of the reach of small businesses.

Among the main problems which are facing these SMEs one can cite:

1. Financing shortages,
2. Real state and industrial property problems,
3. Technological problems,
4. Administrative problems,
5. Marketing problems.

Since SMEs are struggling for survival day to day, it is no wonder for their Managers/Owners to be pessimistic on the whole when they were first approached for the purpose of the study.

### **4.2 - Demographic indicators**

All SMEs questioned are from the private sector and comply with the Algerian definition of SMEs in term of the workforce size criteria as well as regard to the minimum turnover criteria. Furthermore, most of them can be considered as Micro-enterprises.

Most respondents were SMEs managers having a University degree with an insider experience stretching beyond 5 years. They are almost males in their mid-age (Forties).

### **4.3 - Perceptions & Attitudes**

It seems that SMEs Managers on the whole have a fair perception of both the conception of e-commerce and its importance for their enterprises.

As for SMEs Managers attitudes towards e-commerce, despite the fact that it is difficult to sum up all respondent's attitudes it seems that the overall attitude can be described as positive.

As an answer to a direct question dealing with their satisfaction about E-commerce applications in their companies, most respondents said that it was unsatisfactory.

One explanation for this paradoxal finding might be found in the fact that SMEs managers perceived positively the sense of E-commerce, its importance for their companies, and hence developed positive attitudes towards E-commerce probably because of some digital exposure in their daily environment.

Yet, obstacles and the lack of enough resources are still hampering the implementation and adoption of E-commerce in their companies which in turn explains why they are not satisfied with its application.

### **4.4 - E-commerce adoption**

One extremely important finding of this study concerned the rate of computer use in the SMEs surveyed (Computer Penetration Rate). 96% of these companies used computers daily but most of them (95%) owned less than 9 computers. As for computer applications, the main usages are traditional such as management, accounting and wages. It seems that in either cases this is rather consistent with SME's size and the means at their disposal.

69% of SMEs managers use Internet dial-up which seems to be a fair rate. Yet 76% of respondents don't apply so far E-commerce solutions. Furthermore, those who are applying some kind of E-commerce do so in their majority (91%) through E-Mail.

In response to some questions about the availability of integrated payment and order systems 60% of SMEs managers said that their companies use a mixed system (traditional and automatic).

As for the number of in-house ICT specialist, the majority of answers converged to "less than 3" but only 22% of them are able to create and maintain E-commerce systems.

Although, it is not easy to generalize these findings concerning SMEs managers perception and attitudes outside the region surveyed (Ghardaia county- Algeria) it is worthwhile at this point to pinpoint the main particularities of this case:

- Many problems facing SMEs locally such as financing, Industrial estates, foreign competition...etc.
- Lack of economic and technological information.
- Weak communication infrastructure.
- Inefficiency of local professional association and their bureaucratic nature.

Of course, it is possible to face-up such shortcomings mainly by designing and applying a comprehensive strategy aimed at helping SMEs in general and especially in their adoption of E-commerce solutions.

## 5 - EXTRA RESULTS

It should be noticed that all questions contained in part 3 and 4 of the questionnaire and which relates to the use of computers and e-commerce adoption in SMEs in Ghardaia county may be considered as extra results since they are not directly linked to the main and sub-hypothesis. However, question no5 from the first part which concerns SME managers perception about the importance of e-commerce prerequisites is an exception. The following table no7 will deal with this particular area.

Table N° 7

Question N° 5: The importance of e-commerce prerequisites	Mean	T test	Std Deviation
1 – As physical & technical resources	2.5273	6.167	0.6341
2 – As qualified human resources	2.4909	5.737	0.6346
3 – As necessary infrastructure	2.2364	2.437	0.7191
4- As technical support	2.1273	1.264	0.7467
5 – As necessary financial resources	2.4182	4.524	0.6856
6 – As adequate legislation	1.8364	1.418	0.8556
7 – As government support	1.6545	3.208	0.7986
Average	2.016	4.965	0.7249

Despite what have been said about these question and the fact that they are not linked to the main and sub-hypothesis of the study, still the respondents highlighted the importance of the existence of such prerequisite to the adoption of e-commerce. Of course the value of T test being superior to 0.005 confirms statistically this tendency among SME managers in Ghardaia county.

## **6 - AN E-COMMERCE MODEL:**

There is no doubt that organisations and SMEs for that purpose need to perform radical internal organizational changes should they plan to benefit from the Internet and its applications.

Many authors have proposed models for E-commerce adoption/application but we think that what have proposed Chau & Turner (2002) can be suitable to our case with some modifications. It is proposed that a multi-level Model will be applied to the case of SMEs adopting E-commerce solutions. The three level Model concerns a space/geographical strategic approach that is local (the organization), regional (the County), and national (the Country).

### **6.1 - The Organization (SME)**

A two-step approach is proposed for the organization a SME in our case, in order to undergo all the necessary changes to become E-commerce enabled.

#### **1<sup>st</sup> Step: Experimentation.**

Here, the introduction of E-commerce will yield few benefits and needs small organizational changes.

#### **2<sup>nd</sup> Step: Consolidation.**

We need at this stage a clear strategic leadership which is based on much more resources and more organizational changes in order to take full advantage of E-commerce possibilities.

### **6.2- The Region**

This is the interface between the local (SME) and the national level. Industrial integration, sub-contracting, and E-Services sharing can strengthen the position of SMEs in the region. From the past experiences in many developed countries which have succeeded in helping their SMEs to adopt E-commerce such as Australia, Canada,

and even the USA, there is no doubt that decentralised and regional initiatives are of paramount importance.

### **6.3 - The National**

We need to provide some "Essentials" to a nationwide strategy for helping SMEs to adopt E-commerce solutions which are:

#### **1 - Education and awareness.**

It is very important to disseminate a computer / Internet literacy among all citizens at large and to target particularly young entrepreneurs and SMEs managers.

#### **2 - Financial institutions and Banks.**

In addition to their traditional duties, financial and banking institutions through their management of electronic money exchange ought to be ready in order to help SMEs to adopt E-commerce solutions and act as back-end actors in electronic transactions.

#### **3 - Technology providers.**

ISP and Software/Hardware marketers as well as Web concepters and Dbase programmers play a key role in establishing back-ends of E-commerce sites. They contribute in solving safety problems, product presentation, order-taking, buying confirmation...etc.

#### **4 - Services industry**

The availability of an efficient transport and mail/parcel delivery sector will greatly help E-commerce operations in order to deliver ultimately the goods to the end-user swiftly and safely.

#### **5 - Proper legislation.**

Laws need to be reinforced by a specialised E-commerce legislation that can protect and stimulate all parties i.e. protecting consumer rights, property right, intellectual copyright.

#### **6 - Adequate policies**

In order to help SMEs in adopting E-commerce solutions, policies should be initiated in many areas as mentioned earlier:

- Consumer rights, safety, and privacy,
- Development of financial and banking sector,

- ICT literacy dissemination as part of education,
- A Nationwide strategy to help SMEs adopt E-commerce.

## **7 - Recommendations**

Based mainly on our this study findings as well as on other experiences in the adoption/ Appropriation of E.C by SMEs , we do recommend the followings.

### **7.1 - For the Organisation**

- Creating a national E-commerce Committee for coordination and consultation purposes.
- Establishing a national strategy for E-commerce dissemination especially within the SMEs tissue in the mid and long term.(5-10 years).
- Creating an E-commerce authority.
- Lunching the E-Government project.
- Issuing safety and privacy new legislation.
- Encouraging public and private organisations which endeavour to apply the E-commerce plan or some of its components.
- Creating new courses and specialisms within colleges and universities related to E-commerce vocations and jobs.
- Organizing seminars and conferences which deal with E-commerce and E-government.
- Creating E-commerce centres to help in disseminating awareness and in providing assistance to SMEs.
- Obliging exporting companies to adopt E-commerce prior to any export transaction.
- Encouraging commerce and industry chambers and other professional bodies to adopt e-commerce solutions for their members.
- Initiating a campaign of Awareness towards teens and school population about E-commerce.

### **7.2 - On the Technical side**

- Reinforcing and developing telecommunication infrastructure.
- Liberalizing ISP markets.
- Developing an E-commerce infrastructure such as Pki, e-authentication, e-signature...etc.
- Developing a safe payment system (ATM, e-cards).



- Generalizing the use of satellite telecommunication especially in remote areas.
- Generalizing the use of fiber optic networks nationwide.
- Generalizing the use of Broadband technology nationwide.

### **7.3 - On the Economic side**

- Tax- reducing on computer/Internet/E-commerce hardware and software transactions especially when imported.
- Creating Duty-free zones, E-exhibition, Technology Parks... etc.
- Protecting and encouraging a local ICT industry.
- Encouraging an international and regional cooperation in ICT sectors.
- Dismantling step by step any forms of monopoly in the ICT sector.

## **CONCLUSION**

Authors managed to prove the validity of the main and sub-hypothesis put forward from the beginning i.e. that SME managers in Ghardaia county are aware of the concept of e-commerce as well as of its importance for their businesses.

Secondly, it has been proved that SME managers attitudes towards e-commerce in Ghardaia county are on the whole positive.

Finally, authors discovered a strong positive correlation between SME managers attitudes towards e-commerce and their level of satisfaction about its implementation in their businesses.

It must be however said that, findings as any empiric research results need not to be generalized without caution. Authors believe that the main result concerns the perception and attitudes of SMEs managers in Ghardaia county towards e-commerce which seem to be positive. This high level of positive awareness should not only be monitored by decision makers in the future, but also be used as a laying foundation for any E-commerce strategy for SMEs.

The lack of resources coupled with the inadequacy of overall environment both locally and nationally are the two main deterrents to any adoption by SMEs of e-commerce solutions.

There is a real opportunity before those in charge of SMEs, ICT responsables, and Commerce and Industry decision-makers to bridge

the digital gap through assisting, encouraging and accompanying SMEs in their crusade to e-commerce shores.

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