



THE USE OF INFORMATION TECHNOLOGY FOR MICRO AND SMALL ENTERPRISES IN BRAZIL: A CASE STUDY OF SECTOR ARTISTIC CERAMIC IN PORTO FERREIRA-SP

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For to be competitive becomes priority for the companies the access to accurate and reliable information for decision making. This condition is also valid for smaller companies, with a significant presence among Brazilian companies. Thus,, micro and small businesses should incorporate Information Technology (IT). In this context, this article aims to characterize the use of Information Technology for business management of micro and small businesses that make up the sector of artistic ceramic in Porto Ferreira, located in the state of São Paulo, Brazil. The research is classified as descriptive and applied, developed through qualitative approach and treatment qualitative-quantitative of the data. From the point of view of procedures and sources for obtaining data and information, beyond literature search was conducted field survey, with the methodological approach the case study of an industrial sector. Among the results, we could identify the low level of utilization of Information Technology for business management in the majority of micro and small companies studied, a situation not unlike the theoretical and empirical referential researched.

Keywords: *Micro and Small Enterprises, Information Technology, Sector of Ceramic Artistic, Porto Ferreira / SP.*

1 Introduction

The business world is undergoing constant change, making priority access to accurate and reliable information for decision making. With the transition from the industrial economy to the information economy, knowledge shall be primarily responsible for the generation of wealth and prosperity of businesses, especially companies that use the information in a more agile, standing out among the companies which hitherto were winning only because they are large in size (ANDRADE et al, 2004).

According Popadiuk et al. (2006) the influences exerted by changes increasingly accelerated, will require significant changes in the forms of corporate action involving productive and operational processes besides procurement, processing and distribution of information and knowledge, aiming at making internal decisions, strategic and / or interorganizational.

Thus, for the smaller companies, which represent 99% of all Brazilian companies (SEBRAE, 2010), can participate effectively of this new business scenario, should incorporate information technology (IT).

According to Stair & Reynolds (2011) information technology, with high processing capacity, can increase employee productivity, expand business opportunities and allow for greater flexibility.

Albertin (2005) believes that information technology currently constitutes one of the most important components within the business environment, being used at both strategic and operational levels. It also states that the level of use of information technology generates the challenge of identifying the degree of contribution these technologies will bring for the company's results. Information technology has become essential to business practice, mainly by changes in the sector (LAUDON & LAUDON, 2007).

According to Campos & Teixeira (2004), information technology meets significant role as a resource to be used to subsidize the general management of companies: provides elements for defining business strategies; supports managers in monitoring the business; promotes faster internal communication and with suppliers and customers; streamlines paperwork; facilitates the execution of administrative activities; help in production management.

Laudon & Laudon (2007) argue that information technology has allowed administrators to make use of real-time data, arising in the market itself, to make a decision.

Therefore, the use of information technology resources in micro and small enterprises, it becomes an important tool to assist their leaders in business process management. However, micro and small enterprises (MSEs) have a low level of use of information technologies and great difficulty using information as a strategic resource.

Considering the special features and some of the problems faced by small businesses, seconded by Roberts et al (2000), one can better understand the low level of incorporation of IT by firms of this size. Among the problems are: undercapitalization, lack of technology in the industrial park and scarcity of resources for rehabilitation; managerial unpreparedness of most entrepreneurs to compete internationally.

In fact, the process of computerization in the micro and small business takes time to implement and major investments, besides facing difficulties in use and maintenance of these technologies (AUDY et al, 2000).

The purpose of this article is to characterize the resource utilization of information technology for business management of micro and small companies of artistic and decoration ceramic of Porto Ferreira, a municipality located in the interior of Sao Paulo state, Brazil.

This objective was formulated keeping in view the justifications for the slower pace of deployment of information technology in small businesses in Brazil, compared with larger companies. These

justifications are based on the lack of financial, organizational and human resources on the part of these companies, that give support to the merger of IT to manage their business. The preceding argument justifies the claim of inadequate supply of IT resources for businesses of this size.

2 Information technology in micro and small enterprises

In the early 2000s was small the number of micro and small companies using the resources of information technology to manage your business.

The fact of the environment of the MSBs be extremely flexible and informal, configure a difficulty to find solutions that meet those characteristics. The products available are specific to large enterprises, that have processes and tasks highly standardized and formalized, in contrast to the lack of financial resources on the part of MSEs for acquire information technology products.

Over the years, however, MSEs have greater access to information technology resources. The SEBRAE-SP, Service of Support for Micro and Small Enterprises in the state of São Paulo (2008) conducted a study that indicated an increase in the use of information technology by Brazilian MSEs. Between the years 2000 to 2008, around 50% of these companies started using information technology resources. The study sought also to identify the degree of utilization of equipment Information and Communication Technologies (ICTs) in MSEs, with special emphasis on the use of cell phones, computers and internet. From this research it was possible to prove that in 2008, in Brazil, 91% of MSEs used, routinely, cell phones, 75% use computers and 71% had Internet access (SEBRAE-SP, 2008).

In 1992 only 2% of MSEs Brazilian were using microcomputers in support of their business. In 2008, this percentage rose to 75%, an increase of 73 percentage points, which highlights even more the importance and potential of the use of information technology resources for the management of the business, especially MSBs (SEBRAE SP-2008).

Cetic.br (2010) showed, through the department of Core Information and Coordination Point BR (NIC.br), which is the executive arm of the steering committee of the Internet in Brazil (CGI.br) research on the use of ICTs by Brazilian microenterprises. This study shows that Brazil has around 1.7 million micro-enterprises, employing around 14% of the active labor force of the country. For the study, it was possible to detect that 77% of micro enterprises reported using computers, 69% had Internet access and 36% use mobile corporate, jumping to 61% corporate phone use in small businesses EPPs (CETIC.BR, 2010).

For the development of the field work, through which we collected data and information used in this article were taken as references: general characteristics of information technology; obstacles to the incorporation of IT by MSEs; types of information systems available .

Based on these references was raised the use of IT by companies of artistic and decoration ceramic of Porto Ferreira, to its management. Were considered: the availability and usage of computers; areas of business where computers are used and major problems and obstacles to use.

3 Methodology of the research

3.1 Methodological Framework of Research

The research that supports this article can be classified: a) regarding the objectives as descriptive, b) from the point of view of using the results as applied, c) in terms of the origin of the data and information, it is a combination of literature research and field research, d) in terms of the data sources were used primary sources and secondary sources, e) it is a qualitative research as to the approach; f) finally, considering the types of research used in scientific productions in Production Engineering,

identified by Berto and Nakano (2000), the research that gave support to this article use the Case Study as a strategy to approach and clipping of reality.

3.2 Characterization of the research universe and the selected variables

The choice of the research universe was given by the interest in evaluating one of the major industrial sectors in the municipality of Porto Ferreira, São Paulo, Brazil. This municipality is nationally known as the capital of artistic and decorative ceramic, because it has a lot of companies in the same segment.

It was taken as universe of the research a sector characterized by the fact gathering micro and small enterprises, which produce relatively independently, ceramic products with certain characteristics - artistic ceramics and decoration. This sector presents itself with a strong presence in the identification of the municipality in which it is installed. By reason of essential determinations of the universe was chosen for the case study of the sector, and the inside of it, the evaluation of the companies that comprise it.

Through this case study, we sought to characterize the process of search and incorporation of information technology by micro and small companies in a sector, that was defined as the object of the case study.

By reason of the commitment to confidentiality with the companies analyzed are not shown their names. They are listed A through N.

3.3 Phases of fieldwork

The fieldwork was carried out from October 2011 to February 2012 in two phases.

In the first phase a structured questionnaire was used to collect general information about the companies of the sector ceramic artistic and decoration of Porto Ferreira.

In the second phase of the research was used a structured interview as a tool for data collection, applied for entrepreneurs of thirteen companies, in January 2012, on the spot, by the researcher.

3.4 Organization, processing and evaluation of data and information

For the organization, treatment and evaluation of the results of the field research were used as references both, the theoretical and the empirical reference, extracted from the bibliography on MSEs, their characteristics and incorporation of information technology for business management.

Information collected received qualitative and quantitative treatment.

4 The Use of IT for the management of companies of the artistic sector ceramic of Porto Ferreira

All companies interviewed have computers. The amount varies according to the size and mainly functions within the business. There is variation from one to thirty two computers.

The higher frequency observed in relation number of computers per company was two for five registered companies. Only one company submitted thirty-two computers.

According to the result of the interviews, the computerization occurred in many companies since the beginning of its activities. In others to monitor the advancement of the information era, when the use of computers has become extremely necessary.

The distribution of computers by companies is shown in Table 1.

Table 1 - Number of computers by company artistic ceramic Porto Ferreira

NUMBER OF COMPUTERS	NUMBER OF COMPANIES
1	2
2	5
3	1
4	1
5	3
8	1
32	1

Source: Research of the authors (2011-2012)

The main motivations highlighted by entrepreneurs for computerization process were related to the need for streamlining daily procedures of the company, due to the wave of computerization. According to respondents, under the influence of market trends, there was the need to incorporate new ways of generating invoices. In the same way became increasingly necessary to have accurate information for decision making.

The companies reported that during the process of computerization few were the attitudes of resistance from employees regarding the use of information technology resources. Some older employees, accustomed to established standards and strongly rooted in the culture of the organization, showed greater resistance against the computerization process.

According to the interviews, the level of IT knowledge of employees is low in most companies.

The research could identify the recognition by companies that computerization brings numerous benefits. For companies interviewed the main benefits are: a) rapidity for the overall operation of the company; b) issuance of invoice; c) financial statement accurately for decision making; d) agility in process and in customer service; e) requests processing more agile; f) possibility to conduct research; g) reduction the volume of paper; h) leaner and accurate information without wasting time and personnel.

All companies, who were interviewed, have services outsourced information technology. The main services outsourced are: systems development, computer maintenance and network administration.

The reasons highlighted by entrepreneurs for adoption of outsourcing are several, among which can be highlighted: a) the lack of a professional in information technology at the company, available full time; b) due to the size of most enterprises, their IT needs are of small volume, which does not justify the presence of a full-time professional within them; c) a lack of knowledge in IT by enterprises; d) the company engaged the services of the system that were offered along with the maintenance service; e) the good prices practiced by outsourced companies.

The reasons reported by companies to the deployment of information systems were: a) to expedite and facilitate management; b) to obtain information faster and more accurate, and low cost for decision making and development of indicators; c) to have more precise controls over production and stock; d) for business management; e) for management reporting; f) to control customers and suppliers.

Nine of the thirteen companies interviewed said they use an information system to assist in managing the business.

The systems are basically used in all areas of company. The main uses are reported to: a) definition of the quantity of products to be produced, issuing invoices and control of inventory basics; b) emission of reporting sales and cadastres various for administrative sector; c) control of production; d) emission of management reporting (financial and sales); e) cadastre of customers and suppliers; f) history record of sales to customers; g) control of industry and of factory shop; h) dispatch of finished products; i) management staff.

The Figure 1 shows the areas of the companies in which the information system is more used.

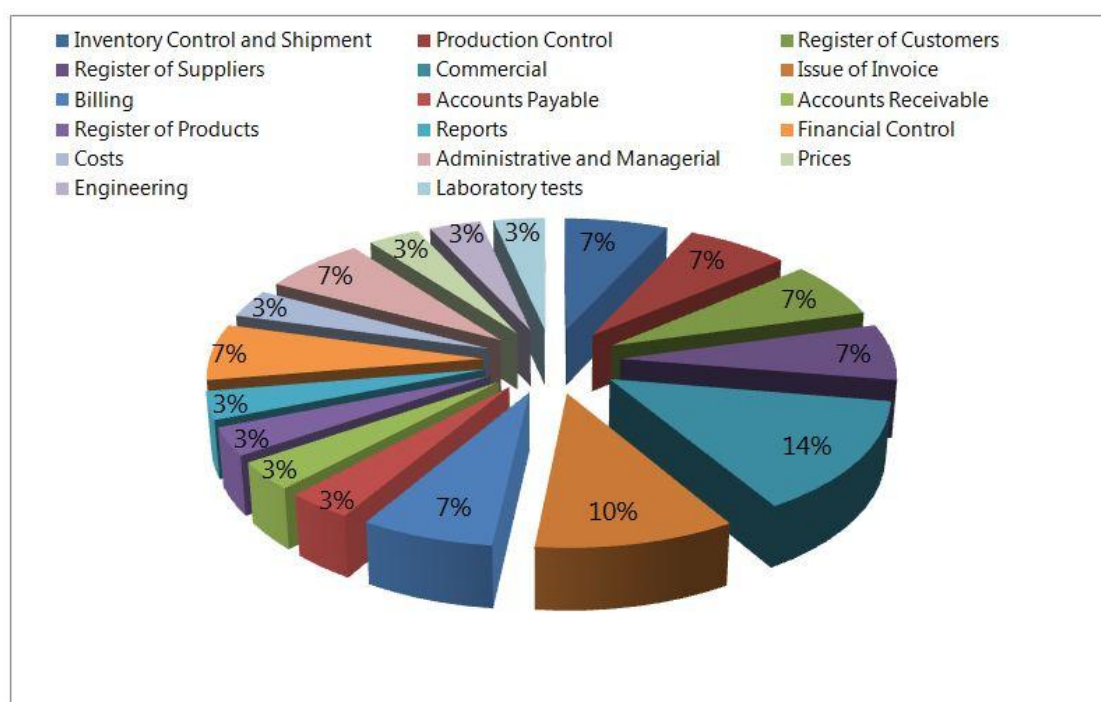


Figure 1 - Areas where information systems are used in companies artistic ceramic of Porto Ferreira. Source: Research of the authors (2011-2012).

From what was reported by entrepreneurs and what was observed by the researcher during the interviews, it can be concluded that the applicability of the information systems used by companies is simply to assist in administrative routines simple and not to assist entrepreneurs in making decision.

Table 2 shows the distribution of the types of information systems that were object reference of the enterprises. Were recorded: the stated by the entrepreneurs interviewed and the observed by the researcher during the interview.

Table 2 - Types of IS (Information Systems) used by enterprises of the sector - stated and observed

Enterprises	Types of Information Systems							
	Transaction Processing Systems (TPS)		Management Information Systems (MIS)		Decision Support Systems (DSS)		Executive Support Systems (ESS)	
	Stated	Observed	Stated	Observed	Stated	Observed	Stated	Observed
A	X	X						
B	X	X	X					
C	X	X	X	X				
D	X	X						
E	X	X	X					
F								
G	X	X						
H	X	X	X	X	X			
I	X	X	X					
J	X	X	X					
L	X	X	X					
M								
N	X	X	X	X	X		X	
Total	85%	85%	62%	24%	15%	0%	0,80%	0%

Source: Research of the authors (2011-2012)

The analysis of Table 2 indicates, in most cases reported that there are differences in what was reported by the respondent and that observed by the investigator.

According was related by entrepreneurs, 85% of surveyed companies use information systems - TPSs to assist in the processing of transactions involving companies operating routines simple. This information was confirmed by the observation of the researcher. In this case, it was evident that 100% of companies which said to use information systems to assist in processing transactions, actually they use this systems, as observed by the investigator.

It is noted also that 62% of companies surveyed reported using information systems - MIS that generate information to help managers make decisions. According Carmo & Bridges (1999), the MISs provide concepts, methodologies, techniques and tools for the executives take strategic decisions based on information. Among the eight companies that reported using MIS, only three companies effectively utilize MIS. Two companies reported using information systems for decision making unusual, focusing on problems that are unique, for which there is no resolution procedures fully defined (LAUDON, LAUDON, 2007).

The observed by the researcher was that the two companies that reported using Decision Support Systems, none actually uses such a system.

One of thirteen companies said to use IS in level of executive support. According to Laudon & Laudon (2007), the ESS helps senior managers to make decisions that involve good sense and the capacity. assessment and perception, because there is not a procedure previously established to arrive at a solution As observed by the researcher, it was possible to determine that none of the companies surveyed use ESS to assist decision-making executive.

It might also note that, both in terms of the reported and how was observed, there is a higher incidence of frequency of use of types of information systems in enterprises N, H and C.

5. Conclusion

Among the reasons for the low incorporation of IT is the lack of integrated management. Companies should also define cooperation strategies for the sector. There is recognition that the use of IT can contribute to that individual companies could be strengthened, but if there were integration between them, could be stronger collectively.

Except one company who states to have registration of their customers and suppliers in an informal manner, the others use mechanisms records of their customers and suppliers stored on computer. In this case it is evident the incorporation of IT. Although companies deposit these records in computer, they are not used strategically to make decisions and assist in management.

It is not enough just know who your customers are; it is vital for management know the degree of their satisfaction. The majority of companies surveyed do not have any mechanism for measuring the degree of customer satisfaction.

The presence of information technology resources within the enterprise does not imply its use to assist in strategic management. The small company faces obstacles that hinder the incorporation of IT as a management tool, among others, the lack of user training.

Entrepreneurs recognize that with computerization, access to resources is facilitated, but it is necessary have skilled personnel. Thus, despite the recognition that with the production computerized the management of production could be improved are pointed out obstacles to its incorporation.

These obstacles that converge with some of the specifics that are common to micro and small enterprises and impact directly the management planning, according to Moraes (2011), citing Gonçalves (1995), Koprowski (1991), Leone (1999) and Solomon (1986) are: the MSEs commonly use the work itself of the family; lack specialized administration outside the company, although low level of

organizational maturity; do not exhibit large scale production; represent a field to training specialized manpower and training of entrepreneurs; have a close personal relationship of the owner both with employees, and with customers and suppliers; have strong dependence of markets and sources of near supply; entrepreneurs seek opportunities in sectors already known; the direction is somewhat specialized and the management is essentially personnel, because the smaller the business, it will be more informal and their resources, personal and commercial, are not distinguished; investments are made in the short term, depending on quick returns for these investments; there is great heterogeneity among small businesses, hampering studies and research; have leaders with great tenacity economic, characterized by long hours of work, willingness to face hard times, with great energy and strong personal initiative capacity; have a very close integration into the local community of owners.

According to Laudon & Laudon (2007) the projects of information technology, which favor companies in the pursuit of increased competitiveness, are the projects of information systems. In the companies of artistic ceramic of Porto Ferreira, one can observe the use of information systems, but not in strategic and executive level, only at the operational level.

Although the use of information systems have been detected by entrepreneurs, has not been applied to strategically assist in decision making and management of the business, but only for simple administrative routines.

The companies in the sector highlighted some points inherent to the characteristics of the small businesses that hinder the process of computerization and the use of information systems to assist in business management.

Among the points highlighted by the companies are: lack of financial resources and mainly lack of knowledge of the benefits that IT can bring to the business; time required of the person responsible in the use of the computer, impairing other shares in the company; lack of financial resources to invest in IT; lack of skilled labor; designing that systems are casted, closed and do not know deal with exceptions; lack of planning for the system to be built from the start of product manufacture to sale, ie in all sectors of the company; lack of management of the company, difficulting the incorporation of IT.

It is evident after analyzing the results of the interviews, that the problems encountered in the studied sector are no different from the reality of micro and small businesses in general. The difficulties and obstacles not only concern the incorporation of IT in business management, but arise from the own specificities of the MSBs. The low incorporation of IT is in the very nature typical of MSEs, among other things, dependent on its leader, with insufficient resources to hire an IT expert for your team, with low scale and market dominance and low profitability.

It was concluded that the incorporation of information technology resources to assist in the business management of companies of the sector of artistic ceramic of Porto Ferreira is low and that companies, when using them, do not do it strategically.

This low incorporation is not attribute only of artistic ceramics industry of Porto Ferreira, but is result of the specificities of small business. At work from Beraldi (2002), who researched the use of information technology in small business of furniture manufacturers, was evidenced the low utilization of IT. The main obstacles what were highlighted were similar: the difficulty of formalization and standardization of processes and operations within companies, lack of financial resources for volume of investment needed and for acquire complete IT solutions.

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