

Why does not e-procurement work in SMEs? Some insights from an Italian case¹

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Abstract

There is a general agreement about advantages for enterprises and public administration in using e-procurement systems. Statistics about B2B e-commerce shows a widespread adoption and more and more industries joining the e-procurement arena. But this trend is not generalized. SMEs are marginal in this trend that they perceive more as a threat for their margins than an opportunity for savings. As a sub project of BIT Italian experience, in joint with Insubria University (Varese) analyzing the procurement activity of a sample of enterprises in the highly industrialized area of Varese (Italy), the authors draw some conclusions about structural factors influencing its adoption by SMEs and the e-procurement potential.

Introduction

The framework of the state of the e-Procurement systems in SMEs of a specific Italian geographical context is based on a research project - realized 2006-2007 by University of Insubria, Varese in collaboration with Politecnico of Milan - sponsored by the local Chamber of Commerce².

Scope of the investigation was to describe and analyze the local procurement and supply system under two fundamental aspects:

- the logic of the relationships among the actors from a strategic, organizational and technological point of view;
- the elements impacting the choice of a procurement solution from the contractual and legal perspectives.

This contribution focuses on the first point. More analytically, the main research questions are:

- Do SMEs use e-procurement as a strategic tool, in partnership or in competition with local companies, inside a specialized supply network or free market in a wider geographical environment (regional, national, international)?
- How do SMEs organize themselves for doing procurement? Who decides and how? What are the main roles and responsibilities?
- How do they use information and communication technology, especially web based technologies?
- What are the favorable factors or the main constraints that limit the use of ICT based procurement in this type of enterprise?

¹ This work has been conceived jointly by the authors. Formal writing has to be attribute in this way: A. Biffi: introduction, paragraph 2, 4 and 5; F. Sacco: paragraph 1, 3 and 5.

² The original research report in Italian, including the questionnaire, is available from the Varese Chamber of Commerce, Italy, www.camcom.varese.it.

Statistics about B2B e-commerce shows a widespread adoption and more and more new industries joining the e-procurement arena. But this trend is not generalized. SMEs are still marginal in this trend that is perceived more as a threat for their margins than an opportunity for savings.

The study analyze this perspective and discusses some of the reasons of it.

1. E-procurement and SME

During the late 1990s and in the pick phase of the new economy boom, there was a huge interest in the idea of e-procurement as a revolution in the business-to-business relationships. Many start-ups got financing to start e-marketplaces in a wide array of industries and change the habits of B2B dealing with different business models. Almost with the same timing, many new ventures, most of which software houses focused in supply chain integration solutions, started a convergent strategy targeted at leveraging the Internet to improve the effectiveness of vertical supply chains. After the explosion of the new economy bubble (2001; Perez, 2002) and a severe selection, the two groups become more similar, with less e-marketplaces and more attention to process improvements than technology.

E-procurement is one of the most discussed topics in supply management, having the potential to dramatically change the way purchasing is carried out (Kraljic and Sept 1993; Buvik 2001; Morrissey and Pittaway 2004). In literature e-procurement is defined as “a technology solution that facilitates corporate buying using the internet” (Presutti Jr 2003) or a “business-to-business purchasing practice that utilizes electronic commerce to identify potential sources of supply, to purchase goods and services, to transfer payment, and to interact with suppliers” (Min and Galle 2003). Using different technologies and because of competition among different business model, e-procurement can take different forms: e-mrp, web based ERP, e-sourcing, e-tendering, e-reverse auctioning, bartering and e-informing (McLvor, Humphreys et al. 1997; Perrings and Ansuategi 2000; Min and Galle 2001).

Its main adoption driver has been since the beginning the promise of total acquisition cost reduction, that was the mantra of its early adoption (Bakos 1997; Croom 2000; Essig, Arnold et al. 2001; De Boer, Harink et al. 2002; Rai, Tang et al. 2006; Kameshwaran, Narahari et al. 2007), even if cost savings in some cases have failed to reach the forecast made by some analysts (Wheatley 2003). The e-procurement potential of improvement in organizations process has been another important key factor for its diffusion (Malone, Yates et al. 1989; Croom 2000; Aberdeen 2005) under different forms (Malone, Yates et al. 1987; Evans and Wurster 2000; Barratt and Oliveira 2001; Croom 2001; Kumar and Qian 2006; Baglieri, Secchi et al. 2007). But there are evidence that in some cases its promises have not been maintained. For example, the study of Emiliani and Stec (2005) on reverse auction use in the wood pallet industry or (2004) in the aerospace industry found that suppliers do not realize the benefits claimed by online reverse auction service providers. Because new sources of costs accrue to buyers and are not accounted for in so-called "total cost" request for quotes (e.g., retaliatory pricing practices, less cooperative relationships, and sourcing work back to the original supplier), qualitative benefits identified for suppliers by third-party online reverse auction service providers are overstated or false and in the long run compromise the mostly shared interests of both buyers and sellers. However, reverse auctions are a technologically assisted form of power-based bargaining that do not represent a key form of electronic procurement.

The e-purchasing solutions market, after a declines in 2001 to 2003 and a slower growth in 2004 to 2005, will reach \$3.04 billion in 2008 from \$2.03 billion in 2004 (Bartels 2007). It could not be defined a mature market although it is almost entering in its adult age. But, while many

multinationals are adopting e-procurement for their day-by-day operations, its diffusion is lagging among SMEs. Soares-Aguiar and Palma-Dos-Reis (2008) confirmed this common opinion and found that e-procurement adoption is positively and significantly associated with firms size, that is the main adoption determinant, followed by technology competence, the perception companies have of their competitors success in using e-procurement, the extent of adoption among competitors and the readiness of the trading partners to perform electronic transactions. They also found that firms whose main activity is commerce are more likely to adopt EPS than are firms operating on manufacturing or services industries.

Patterson et al. (2003) developed a conceptual model of the factors impacting adoption of supply chain technologies. The authors noted that larger firms not only have access to greater financial resources, but are also better positioned to assume the risk of investing in various technologies and to take advantage of the benefits of economies of scale from adoption. Boyle and Alwitt (1999) noted that “larger firms are more apt to use the (Internet) technology than small firms are” and that larger firms were more likely to use the Internet to communicate with customers on order status and to manage the outsourcing of customer service functions. However, smaller firms were more likely to use the Internet in operational ways such as communicating with vendors on finished goods inventory levels and with vendors on out-of-stocks while larger firms use the Internet for purchase items from vendor on-line catalogs and supply lists and to provide vendors with ratings for on-time performance of carriers.

2. Research Methodology

Procurement is a competitive and technical organizational function but also a power centre where decision making has a strong impact on company costs and in which choices do not always follows a transparent path, influenced or bounded by well-established routines or relationships. In this context is always difficult to understand if rational methods, software tools or e-procurement solutions that track every detail of the buying process are just difficult to approach or too transparent to not be looked with suspicion.

In this scenario, the research team has chosen two different approaches for gathering data and information:

- in the first part of the research, mainly using focus groups, qualitative information, beliefs and operative practices were gathered. Three focus groups were organized with people coming from enterprises of different size to define the research hypothesis and obtain a picture of the business context. This work was useful to have a preliminary framework on the situation and to identify the main variables to analyze in a more structured way;
- in the second part of the research, starting from the qualitative results of the first phase, a quantitative survey was prepared based on a questionnaire tested in 8 enterprises and then submitted to a statistically representative sample of 684 SMEs.³ The redemption rate has been of 14,3% (98 useful questionnaire) and the results has been positively tested for representativeness. In tables 2.1 and 2.2 the sample structure.

³ The random sample was stratified by industry with the constraint of being proportionally representative of the number of enterprises operating in each industry.

Tab 2.1 – Number of enterprises by business sector, turnover, number of employees

| Business sector | 2005 | % |
|-------------------------------|-------------|-------------|
| - Metal & mechanical industry | 25 | 26% |
| - Chemicals & Plastics | 40 | 41% |
| - Other (manufacturing) | 6 | 6% |
| - Pharmaceutical | 2 | 2% |
| - Services | 19 | 19% |
| - Textile | 6 | 6% |
| Total respondents | 98 | 100% |

| Revenues (milions €) | | |
|-----------------------------|----|-----|
| - 0-5 | 54 | 55% |
| - 6-15 | 30 | 31% |
| - > 15 | 14 | 14% |

| Employees (2005) | | |
|-------------------------|----|-----|
| - 1-10 | 25 | 26% |
| - 11-50 | 51 | 52% |
| - >50 | 22 | 22% |

Tab 2.2 Research sample: revenues per area, profits, employees and local units (2005 and 2004)

| | 2005 | | 2004 | |
|--|-------------|----------------|-------------|----------------|
| | Avg | Std Dev | Avg | Std Dev |
| Turnover (Euro, .000) | 16.136,8 | 48.352,1 | 15.622,8 | 48.563,7 |
| % Export | 30,38% | 31,22% | 30,37% | 31,21% |
| % Region (Lombardia) | 21,51% | 22,53% | 22,35% | 24,25% |
| % District of Varese | 19,67% | 27,81% | 18,63% | 26,56% |
| % Other | 25,86% | 26,97% | 25,65 | 27,36% |
| Profit | 262,1 | 864,7 | 166,4 | 713,9 |
| Employees | 69,4 | 155,58 | 68,27 | 153,38 |
| Local unit (District of Varese) | 1,31 | 2,49 | 0,97 | 0,81 |

3. Geographic and economic scenario

The research sample has been focused on the Varese's region, a traditionally developed and industrialized area. Varese has an old manufacturing tradition, specialized mainly in metallurgy, textile and mechanics (Tab. 3.1). The average size of companies located in the area, measured as number of employees, is typically small. The transportation industry, that has the highest value, shows an average of 37 workers per firm. Excluding the transportation and chemicals, the two largest industries, the average firm size is about 6 workers. It reflects the Italian characteristic of atomized production in articulated and specialized supply chains that is also the concern of our research.

The Varese manufacturing activity was even more prominent in the past (Tab. 3.2). Since 1999 the number of manufacturing firms has seen a 6% decline while services a 12% increase. The weakening of manufacturing is the result of different dynamics: a strong decline in textiles (-20%), metals (-12%) and chemicals (-10%) partially compensated by an increase in the number of companies operating in the food industry (22%) and in transportation (+16%).

Tab 3.1 Number of firms, number of local units and workers in the Varese's area

| | # of firms | # of firms% | Local units (L.U.) | Total workers per L.U. | Total workers per L.U. % | Average workers per L.U. |
|------------------------------------|---------------|-------------|--------------------|------------------------|--------------------------|--------------------------|
| Agriculture and fishing | 2.194 | 4% | 2.324 | 3.816 | 1% | 1,64 |
| Manufacturing | 12.884 | 21% | 14.808 | 117.253 | 44% | 7,92 |
| Transportation | 164 | 0% | 204 | 7.644 | 3% | 37,47 |
| Chemicals | 269 | 0% | 337 | 7.999 | 3% | 23,74 |
| Rubber and plastics | 763 | 1% | 910 | 10.761 | 4% | 11,83 |
| Mechanics | 1.445 | 2% | 1.653 | 16.427 | 6% | 9,94 |
| Paper and publishing | 626 | 1% | 729 | 5.523 | 2% | 7,58 |
| Textile and clothing | 2.519 | 4% | 2.871 | 21.257 | 8% | 7,4 |
| Electrics and electronics | 1.395 | 2% | 1.594 | 11.747 | 4% | 7,37 |
| Metals and metallurgy | 2.663 | 4% | 3.012 | 20.697 | 8% | 6,87 |
| Food, beverages, tobacco | 1.008 | 2% | 1.138 | 5.324 | 2% | 4,68 |
| Other industries | 2.032 | 3% | 2.360 | 9.874 | 4% | 4,18 |
| Construction | 10.710 | 18% | 11.590 | 25.742 | 10% | 2,22 |
| Services | 35.194 | 58% | 40.738 | 122.316 | 45% | 3 |
| Transportations and communications | 2.361 | 4% | 2.897 | 18.235 | 7% | 6,29 |
| Personal services | 4.269 | 7% | 4.720 | 16.983 | 6% | 3,6 |
| Banking and insurance | 1.623 | 3% | 2.197 | 7.165 | 3% | 3,26 |
| Hotels and restoration | 3.412 | 6% | 3.821 | 12.196 | 5% | 3,19 |
| Business services | 6.976 | 11% | 7.875 | 19.953 | 7% | 2,53 |
| Trade | 16.553 | 27% | 19.228 | 47.784 | 18% | 2,49 |
| Not Classified | 33 | 0% | 34 | 36 | 0% | 1,06 |
| Total | 61.015 | 100% | 69.494 | 269.163 | | 3,87 |

Source: SMAIL, 2007

Tab. 3.2 Evolution of firms per industry in the Varese's are (1999=100)

| INDUSTRIES | 1999 | 2001 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Agriculture and fishing | 100 | 105 | 107 | 107 | 110 | 111 | 120 | 121 |
| Manufacturing | 100 | 100 | 99 | 98 | 97 | 96 | 95 | 94 |
| Transportation | 100 | 104 | 104 | 107 | 110 | 114 | 116 | 122 |
| Chemicals | 100 | 104 | 109 | 105 | 107 | 113 | 114 | 116 |
| Rubber and plastics | 100 | 101 | 102 | 102 | 102 | 101 | 102 | 101 |
| Mechanics | 100 | 100 | 101 | 99 | 100 | 99 | 97 | 97 |
| Paper and publishing | 100 | 100 | 100 | 99 | 98 | 99 | 98 | 96 |
| Textile and clothing | 100 | 100 | 101 | 100 | 100 | 97 | 95 | 96 |
| Electrics and electronics | 100 | 101 | 101 | 99 | 98 | 98 | 97 | 95 |
| Metals and metallurgy | 100 | 100 | 99 | 98 | 98 | 92 | 91 | 90 |
| Food, beverages, tobacco | 100 | 98 | 99 | 95 | 91 | 94 | 92 | 88 |
| Other industries | 100 | 97 | 94 | 91 | 89 | 85 | 82 | 80 |
| Construction | 100 | 105 | 108 | 113 | 118 | 124 | 129 | 135 |
| Services | 100 | 102 | 104 | 105 | 108 | 110 | 111 | 112 |
| Transportations and communications | 100 | 102 | 105 | 108 | 110 | 114 | 118 | 121 |
| Personal services | 100 | 104 | 108 | 110 | 112 | 114 | 118 | 120 |
| Banking and insurance | 100 | 102 | 106 | 110 | 114 | 118 | 120 | 119 |
| Hotels and restoration | 100 | 102 | 104 | 105 | 108 | 109 | 114 | 115 |
| Business services | 100 | 104 | 109 | 107 | 108 | 105 | 107 | 108 |
| Trade | 100 | 100 | 99 | 99 | 99 | 99 | 100 | 99 |
| Not Classified | 100 | 120 | 131 | 144 | 174 | 187 | 176 | 186 |
| Total | 100 | 102 | 104 | 105 | 107 | 108 | 110 | 112 |

Source: Infocamere - Unioncamere, Movimprese, 2006-2007

While the reallocation between manufacturing and services was going on, the average profitability in the area, measured as ROE (Tab. 3.3), has been declining too, performing always worse than the average profitability in the surrounding Lombardy region and sometime also worse than the

national average. This trend is the result of old companies competing in mature industries with little innovation.

Tab. 3.3 Evolution of ROE in Lombardy and its cities

| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|-----------------|------------|------------|------------|------------|------------|------------|
| Lombardy | 9,6 | 8,7 | 4,0 | 2,2 | 3,9 | 5,7 |
| Cremona | 4,1 | 5,4 | 3,9 | 3,2 | 4,9 | 8,5 |
| Bergamo | 6,8 | 5,1 | 3,2 | 7,8 | 3,9 | 7,0 |
| Brescia | 9,4 | 10,4 | 5,6 | 5,2 | 2,9 | 6,3 |
| Lecco | 12,8 | 8,7 | 4,8 | 7,1 | 4,4 | 6,1 |
| Sondrio | 2,2 | 4,8 | 6,8 | 5,0 | 4,6 | 6,1 |
| Milan | 10,5 | 9,4 | 4,0 | 1,3 | 4,1 | 5,8 |
| Lodi | 5,6 | 3,2 | 6,3 | 3,8 | 3,7 | 5,8 |
| Mantova | 4,6 | 5,1 | 4,6 | 4,6 | 3,5 | 4,0 |
| Varese | 6,4 | 5,0 | 2,8 | 2,7 | 1,8 | 3,6 |
| Como | 3,4 | 3,9 | 2,4 | 6,2 | 1,4 | 2,9 |
| Pavia | 7,5 | 3,3 | 4,3 | -0,2 | 1,0 | 0,3 |
| ITALY | 7,7 | 6,6 | 4,0 | 1,0 | 3,3 | 6,9 |

Source: Unioncamere, 2007

A confirmation of this interpretation is given by the evolution of human capital (Tab. 3.4) and capital remuneration as percentage of total added value (Tab. 3.5). In the period since 1999 to 2004 human capital remuneration has grown remaining always higher than the national and regional averages following an opposite path compared to capital remuneration. This trend is partially explained by the growth of service firms compared to manufacturing but its main causal factor is the mature productive activities in the area, in which the workforce contribution is greater than capital. Moreover, the value added production is more concentrated in small companies (with less 50 million euro revenues) than in medium and large firms (Tab. 3.6), where innovation is more difficult.

Tab. 3.4 Evolution of human capital remuneration as percentage of total added value in Lombardy and its cities

| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Lombardy | 61,2 | 60,4 | 59,5 | 59,0 | 60,5 | 60,4 |
| Varese | 65,4 | 64,3 | 66,3 | 67,1 | 69,8 | 69,5 |
| Como | 66,3 | 63,9 | 64,8 | 65,3 | 67,9 | 68,0 |
| Pavia | 61,6 | 63,8 | 62,9 | 64,8 | 67,0 | 67,1 |
| Lecco | 60,0 | 59,9 | 62,5 | 63,0 | 64,8 | 65,1 |
| Bergamo | 63,2 | 61,8 | 62,4 | 61,1 | 64,3 | 64,5 |
| Sondrio | 59,6 | 60,5 | 60,2 | 61,5 | 61,1 | 62,8 |
| Mantova | 63,6 | 60,6 | 58,7 | 58,5 | 61,1 | 60,0 |
| Cremona | 61,7 | 59,3 | 60,1 | 60,7 | 59,1 | 59,7 |
| Brescia | 59,5 | 58,3 | 58,1 | 60,3 | 61,5 | 59,7 |
| Milan | 60,5 | 60,0 | 58,4 | 57,6 | 58,8 | 58,9 |
| Lodi | 62,4 | 63,3 | 60,0 | 62,5 | 59,4 | 57,8 |
| ITALY | 60,8 | 59,5 | 60,3 | 60,6 | 61,1 | 60,3 |

Source: Unioncamere, 2007

Tab. 3.5 Evolution of capital remuneration as percentage of total added value in Lombardy and its cities

| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Lombardy | 29,9 | 28,5 | 28,4 | 29,9 | 27,8 | 30,2 |
| Lodi | 29,4 | 26,0 | 31,1 | 29,0 | 31,7 | 33,9 |
| Cremona | 29,9 | 30,9 | 29,6 | 27,2 | 31,8 | 32,8 |
| Brescia | 30,1 | 29,7 | 30,1 | 29,1 | 28,7 | 31,6 |
| Mantova | 26,1 | 26,4 | 28,5 | 30,8 | 28,8 | 31,1 |
| Milan | 30,7 | 28,7 | 28,7 | 30,5 | 28,2 | 31,0 |
| Sondrio | 31,5 | 29,7 | 30,3 | 30,0 | 31,4 | 30,6 |
| Lecco | 31,7 | 32,0 | 29,2 | 29,5 | 27,7 | 28,6 |
| Bergamo | 27,7 | 27,7 | 27,2 | 30,3 | 27,0 | 27,8 |
| Como | 25,3 | 26,9 | 26,2 | 26,7 | 24,6 | 25,2 |
| Varese | 25,8 | 26,3 | 24,3 | 24,6 | 22,2 | 24,2 |
| Pavia | 29,1 | 25,1 | 26,2 | 23,7 | 22,8 | 23,4 |
| ITALY | 29,8 | 29,5 | 28,2 | 28,8 | 28,2 | 31,2 |

Source: Unioncamere, 2007

Tab. 3.1 Added value in manufacturing per company dimensions (revenues 2005 in million euro)

| Regions and cities | <50 | >50 and <250 | >250 | Total |
|--------------------|------------|--------------|------------|-------------|
| LOMBARDY | 47% | 26% | 28% | 100% |
| BERGAMO | 46% | 29% | 26% | 100% |
| BRESCIA | 56% | 26% | 18% | 100% |
| COMO | 53% | 28% | 19% | 100% |
| CREMONA | 47% | 27% | 26% | 100% |
| LECCO | 52% | 34% | 14% | 100% |
| LODI | 47% | 30% | 23% | 100% |
| MANTOVA | 44% | 25% | 31% | 100% |
| MILAN | 42% | 24% | 34% | 100% |
| PAVIA | 56% | 25% | 18% | 100% |
| SONDRIO | 56% | 19% | 25% | 100% |
| VARESE | 52% | 25% | 24% | 100% |

Source: Unioncamere-Tagliacarne, 2007

These elements could be better interpreted looking at GNP per person that has grown 0.8% in the period 2003-2005 that was not sufficient to avoid losing 6 positions in the rank of Italian cities, performing better than the Italian average, but under the regional level, even if in an intermediate position.

Even though this outline as a mature productive city, Varese has always got a good inclination to export: it is the fourth province for exportation in absolute terms, following Milano, Bergamo and Brescia. In the period 1997-2006 Varese has not been one of the top performer in the region in exportation growth, but registered a performance better than Lombardy even at the level of the North-East macro area, that has been the most dynamic and innovative.

Tab. 3.7 GNP per person in 2005 and differences compared to 2003 in Lombardy, its cities and main Italian areas

| Regions and cities | 2005 | | Variations of GNP per person % 2005-2003 |
|--------------------------------|--------------|-----------------------|--|
| | Italian Rank | GNP per person (euro) | |
| LOMBARDY | 3 | 30.430 | 3,1 |
| MILAN | 2 | 35.776 | 0,6 |
| MANTOVA | 9 | 30.035 | 3,3 |
| BRESCIA | 10 | 29.245 | 10,4 |
| BERGAMO | 17 | 28.100 | 7,1 |
| CREMONA | 27 | 27.227 | 9,5 |
| LECCO | 42 | 25.646 | 2,7 |
| VARESE | 46 | 25.141 | 0,8 |
| SONDRIO | 48 | 24.655 | 5,8 |
| LODI | 50 | 24.276 | 2,8 |
| PAVIA | 53 | 23.764 | 5,1 |
| COMO | 54 | 23.736 | 0,7 |
| NORTH WEST ITALY | 1 | 29.181 | 3,4 |
| NORTH EAST ITALY | 2 | 28.507 | 3,6 |
| CENTER ITALY | 3 | 26.687 | 5,0 |
| SOUTH ITALY AND ISLANDS | 4 | 16.695 | 4,7 |
| TOTAL | - | 24.152 | 4,2 |

Source: Unioncamere-Tagliacarne, 2007

Tab. 3.8 Exports in Lombardy, its cities and main Italian areas 1997-2006 (1997=100, euro)

| Province e Regioni | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|--------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Lombardy | 100,0 | 102,9 | 102,3 | 118,8 | 126,8 | 122,5 | 122,9 | 128,1 | 138,0 | 150,4 |
| Lodi | 100,0 | 111,8 | 141,4 | 155,5 | 182,3 | 190,9 | 196,5 | 225,7 | 257,5 | 297,5 |
| Cremona | 100,0 | 109,1 | 104,9 | 120,2 | 136,3 | 136,8 | 140,4 | 155,5 | 178,0 | 237,5 |
| Brescia | 100,0 | 105,7 | 98,2 | 102,4 | 114,3 | 103,5 | 122,5 | 133,2 | 139,0 | 166,6 |
| Sondrio | 100,0 | 109,0 | 103,7 | 121,7 | 129,4 | 125,7 | 129,1 | 129,1 | 148,1 | 161,8 |
| Mantova | 100,0 | 103,8 | 103,6 | 124,2 | 133,8 | 135,5 | 136,2 | 138,6 | 144,9 | 160,7 |
| Lecco | 100,0 | 104,6 | 106,4 | 123,9 | 126,8 | 122,0 | 113,5 | 122,7 | 143,2 | 155,8 |
| Bergamo | 100,0 | 102,2 | 97,6 | 112,5 | 120,1 | 111,9 | 109,8 | 127,6 | 139,2 | 155,4 |
| Varese | 100,0 | 100,5 | 102,9 | 119,2 | 114,3 | 116,5 | 124,3 | 128,5 | 140,9 | 154,6 |
| Pavia | 100,0 | 105,5 | 107,8 | 120,3 | 123,3 | 133,9 | 131,9 | 141,8 | 148,0 | 149,0 |
| Milan | 100,0 | 103,0 | 104,4 | 124,8 | 135,3 | 130,4 | 126,5 | 126,6 | 137,1 | 143,5 |
| Como | 100,0 | 96,3 | 92,7 | 106,8 | 108,2 | 104,4 | 101,3 | 102,7 | 102,0 | 107,7 |
| NORTH WEST ITALY | 100,0 | 101,6 | 100,3 | 116,1 | 123,0 | 118,7 | 119,3 | 124,1 | 132,2 | 143,5 |
| NORTH EAST ITALY | 100,0 | 106,4 | 108,9 | 125,5 | 132,0 | 133,0 | 129,6 | 139,7 | 144,8 | 158,7 |
| CENTER ITALY | 100,0 | 103,1 | 104,4 | 126,6 | 129,5 | 130,2 | 124,0 | 130,3 | 132,2 | 150,0 |
| SOUTH ITALY AND ISLANDS | 100,0 | 110,5 | 109,9 | 140,4 | 145,5 | 141,1 | 137,5 | 148,2 | 165,4 | 176,5 |

Source: Tagliacarne Istitute and ISTAT, 2007

In conclusion, Varese is a typical area with an industrial tradition in the middle of a transition phase. Services are growing but they are not as important as it was manufacturing in the past. Value added is more centered in human capital than in capital, because of a lack of investment in new production plants but exports are still strong and growing even if with a weak perspective. Then, we can consider Varese as a good benchmark of an area where the adoption of new technologies could not be impacted by the lack of production activity or investment capacity or competitive pressure.

4. Research evidences

Here, briefly we present the most relevant research results as a framework of the main research questions.

SMEs manage the purchase of direct goods (the most critical for business success) mainly as single purchases (between the 75% and 100% of total value in about 50% of SME). No one uses online auctions or has experienced it. In indirect goods purchasing (insurances, financial services, instrumental goods, maintenance, etc.) the situation is similar but there is a certain presence of on line auction (only 1% of the companies use the web for more of 75% of the purchased value). The general trend in procurement is to prefer flexibility than planning using spot purchases. Only with some indirect goods a few companies sign general contracts, which are more constraining but also more competitive long term.

This “spot approach” is matched with some other characteristic:

- a reduced number of suppliers: in the purchasing decision making they usually involve only few suppliers each time (Tab. 4.1).

Tab. 4.1 Suppliers: how many and where.

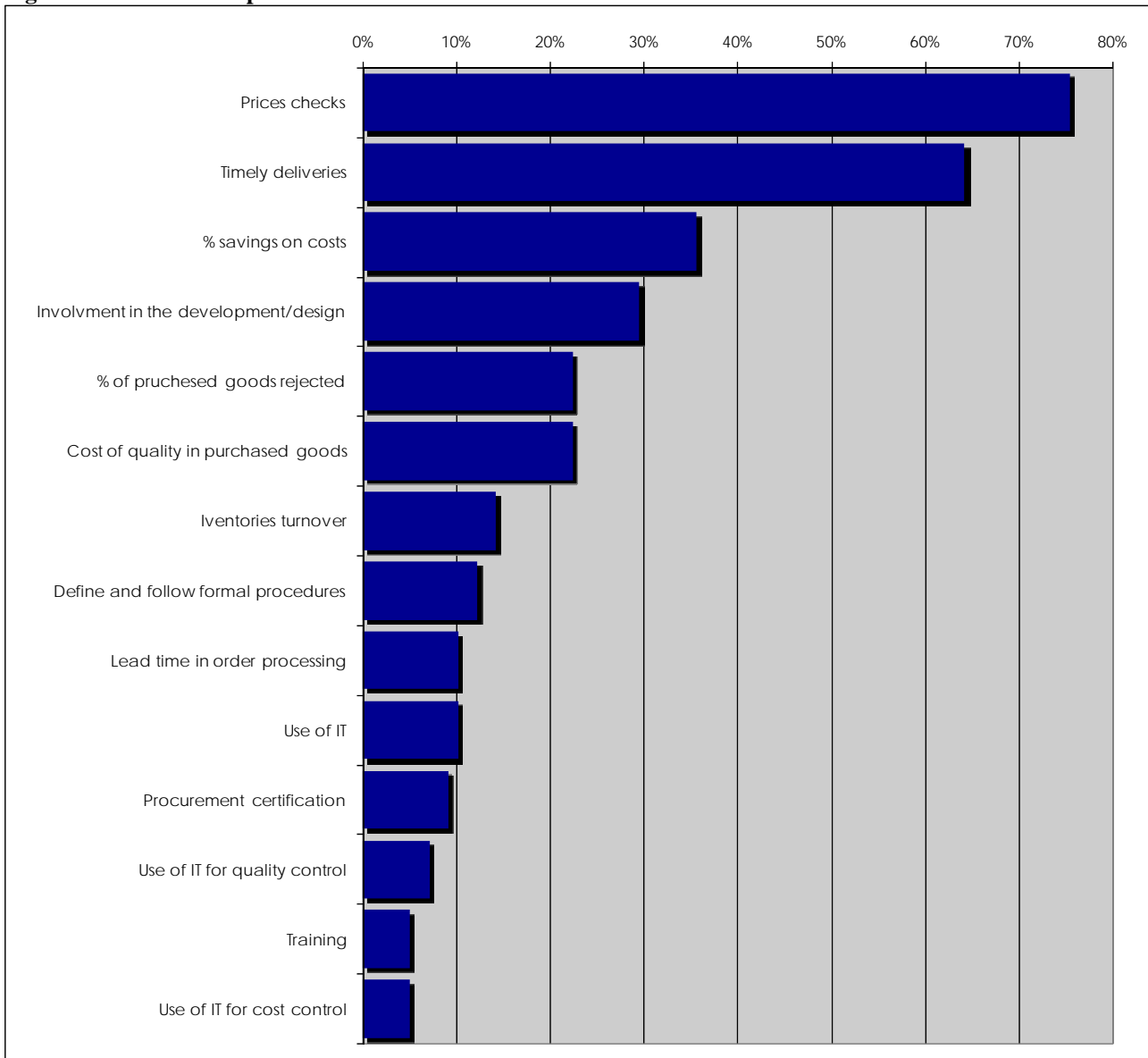
| | Direct Purchases | Indirect Purchases | Notes |
|---|-------------------------|---------------------------|--------------------------|
| N° suppliers (avg) | 33 | 44 | 60% less than 25 |
| N° suppliers consulted by each purchase | 2,73 | 2,85 | |
| Purchases in the district (assign to local suppliers) | 17% | 45% | Same percentage in value |
| Timing in programming | | | |
| - Daily | 28% | 18% | |
| - Weekly | 34% | 32% | |
| - Monthly | 38% | 34% | |

- The balance of influence among the actors is considered in equilibrium and the main factors in negotiation are technical requirements, price and delivery time.
- The proximity and integration with supplier is not important. Where there is some form of supply chain management (14% of cases) not more than 4 suppliers (57% of SME) are involved and principally in managing the operative flow of production (it is really modest the cooperation in defining demand trends and planning the production).
- No one participates in a stable way in an e-marketplace.

➤ *What the critical factors for procurement activities in SME of the district?*

Respect of price budget and timing in delivery are the critical purchasing decision factors. Decision makers tend to not invest in technologies or people training, that are little considered (see Fig. 4.1). They mainly focus their attention on more traditional aspects of procurement work.

Fig. 4.1 Main factors in procurement decisions



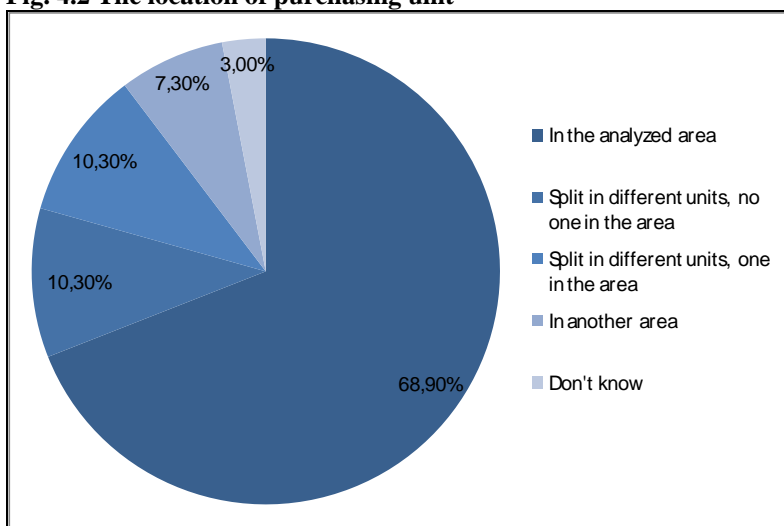
The suppliers' list selection is an unstructured process, essentially based on direct knowledge and contingencies.

Only one third of SMEs (31,1%) has a structured organizational unit responsible for purchasing, it is located in the analyzed area in 69% of the cases (fig. 4.2) and is composed of 3 people.

Tab. 4.2 Suppliers selection process: main characteristics

| | |
|---|----------|
| Is it a formal process? | % |
| Formal | 39% |
| Not formal | 54% |
| Frequency in updating the suppliers' list: | |
| Annually | 32% |
| Each semester | 9% |
| More frequently | 5% |
| Doesn't exist frequency/random | 54% |
| Updating the suppliers' list is based on: | |
| Direct knowledge | 32% |
| Commercial relationship | 62% |
| Specialized data base | 10% |
| Other | 9% |
| Do you request a certification to the suppliers? | |
| Yes | 52% |
| Not | 23% |
| Not answer | 24% |
| <i>If yes, what certification?</i> | |
| Granted by you | 6% |
| Granted by third parties | 18% |
| ISO 9000 | 46% |

Fig. 4.2 The location of purchasing unit

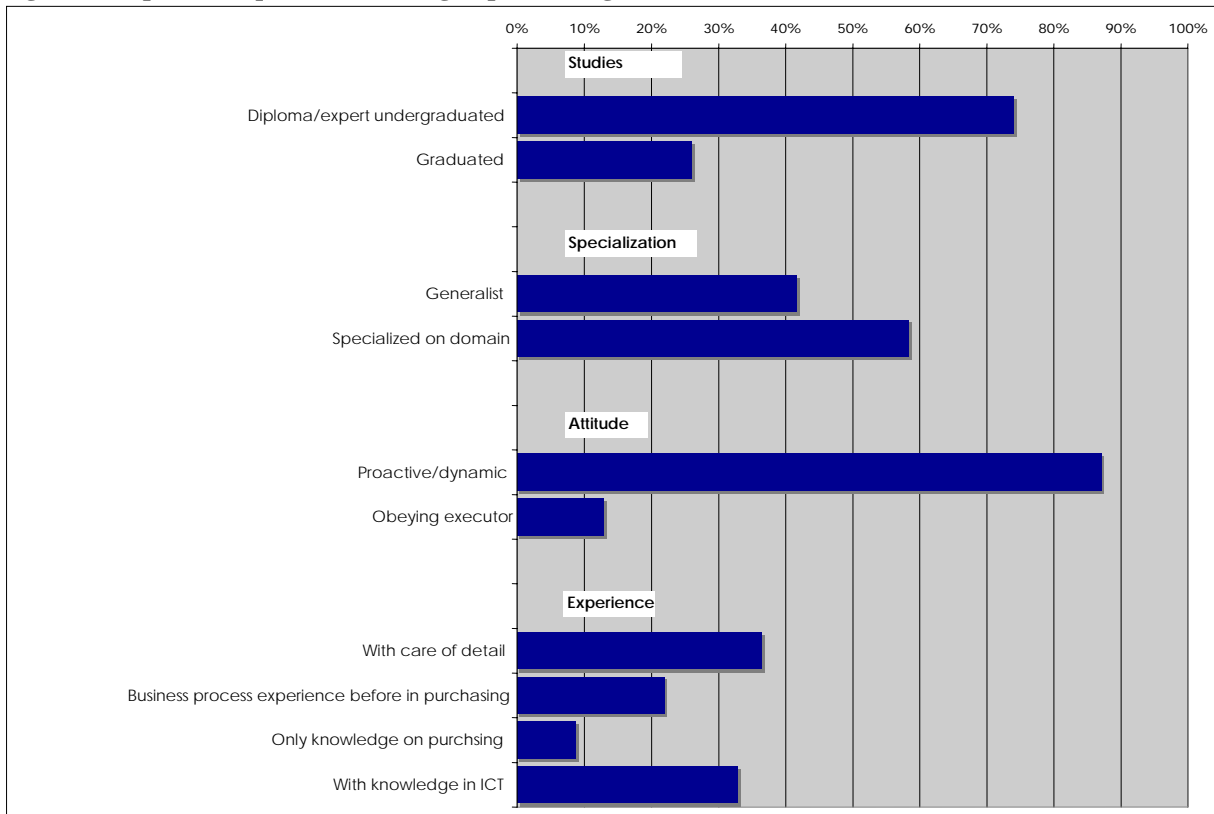


When a specific unit does not exist, the managerial roles involved in the procurement activities are the purchasing manager/Buyer (35%), the production manager (33%) or the entrepreneur (24%).

The latter together with the director of production has the main responsibility in the decision process⁴.

The state of art shows that this sensitive activity is under the direct control of the company owner that delegated to specific and specialized professionals. This “cultural” factor is reinforced by the ideal profile researched by SME for potential candidates in purchasing: more operative and with knowledge on business instead of specialized in the specific domain (see fig. 4.3).

Fig. 4.3 The profile request for working in purchasing activities



Investments in training are modest (in average, 13,5% SME invest in training spending about 5,800 euro for no more than 2 employees) and very fragmented (the main topic are: english language, ICT, quality, security, legal, budgeting, etc.). Substantially, it is difficult to define a general profile of roles and unit working on purchasing, but each SME seems to have its specific organizational solution.

➤ *What technologies are used in procurement activities? How about their relevance? What the stated perspectives?*

On the technology side, it is possible to group the different solution in three main categories:

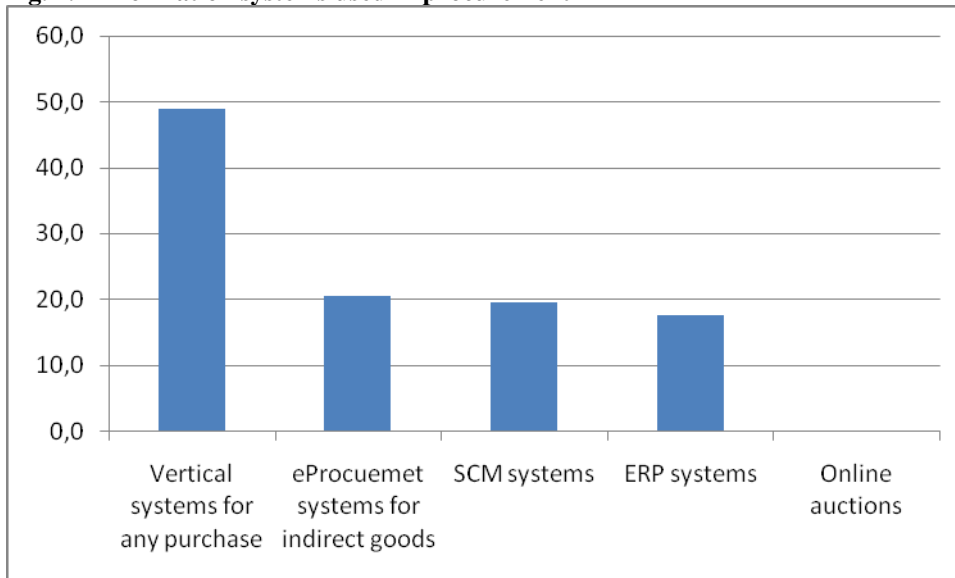
1. supply chain management systems for the integration at the beginning or at the end of the process;
2. specialized systems for catalog purchasing or for participating to tenders and auctions, generally web based, useful to make the process more transparent and efficient;

⁴ It is important to notice that in this type of enterprise generally entrepreneur, director of production or purchasing are the same person, and this fact enforce the degree of centralization in decision process.

3. systems for document management and collaboration as office automation systems and groupware.

SMEs have and use email (98,9%) for all the activities, but only 25,4% of them use email to send orders to suppliers. The information systems used are indicate in Fig. 4.4

Fig. 4.4 Information systems used in procurement

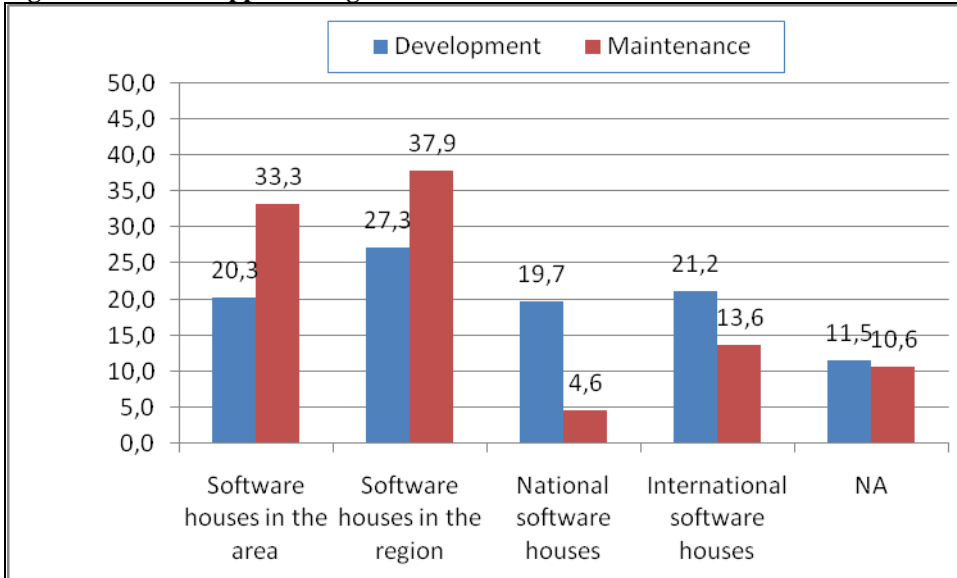


The low rate of e-procurement utilization is evident. The enterprises that use this modality exploit the functionalities for researching & evaluating suppliers (27%), for managing the catalogues (10%), for managing the operative work of offers (24,3%). More sophisticated functions for analyzing spending and managing auctions and tenders are not used.

Who uses SCM functionalities (19% of the sample) is focused on managing orders (25,7%) and planning/programming purchases (25,7%), 55% of firms uses fax, 25,4% email and 16,3% phone directly to send the orders to supplier. Applications as extranet/EDI, formal solution for integrating customer and suppliers are practically inexistent. The relevance of ICT in this enterprise – and e-procurement in particular – is very modest and intra-organizational more than inter-organizational.

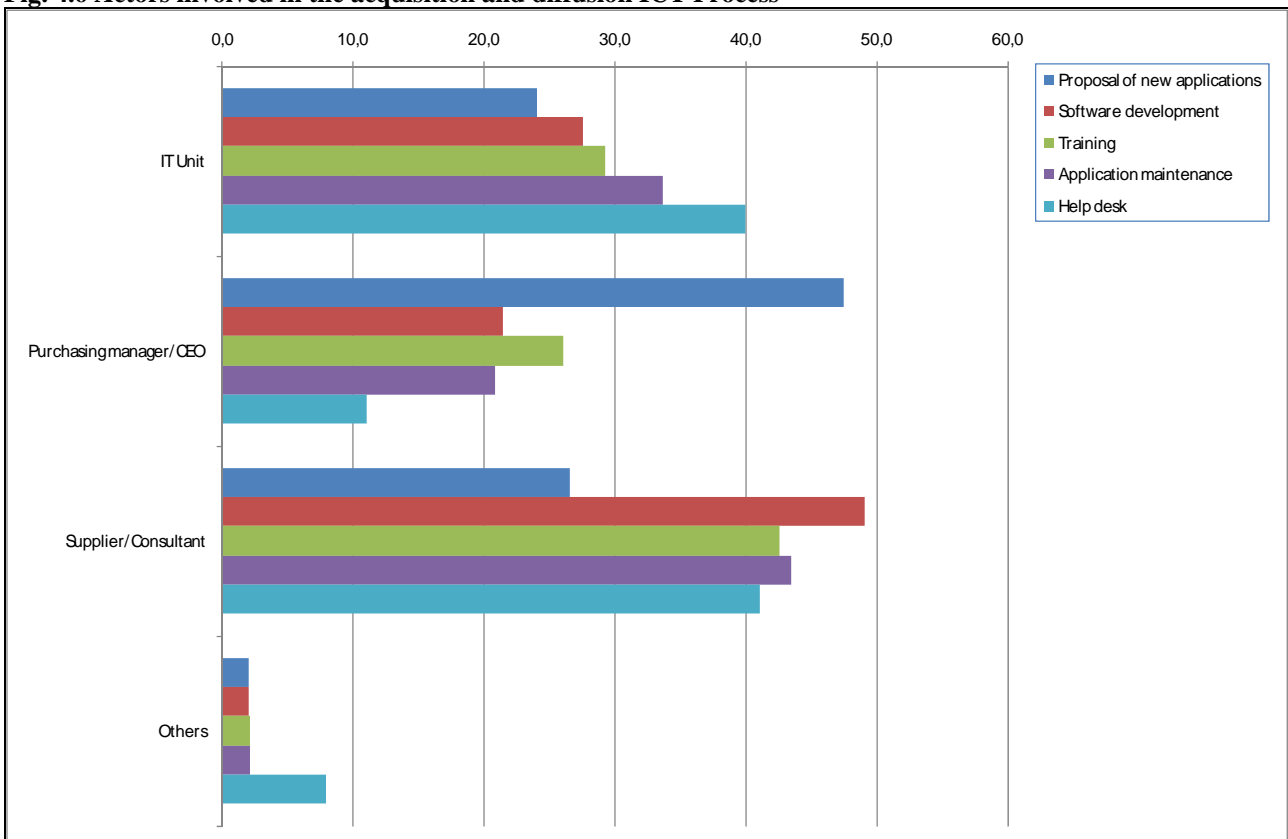
As for as the aspect of sourcing is concerned, 17,3% of SMEs use outsourcing for designing and managing information systems. The rest of the group uses information systems in house, purchasing software by different suppliers (Fig. 4.5), mainly from software house located in the region (47%).

Fig. 4.5 Software suppliers origin



The decisional process about acquisition and diffusion of ICT for procurement is mainly guided by the CEO and the purchasing manager (where present): in other IT related decisions a relevant role attends to suppliers and consultants (Fig. 4.6).

Fig. 4.6 Actors involved in the acquisition and diffusion ICT Process



The SMEs are generally satisfied of their information systems (4.3 on a 6 based scale) and they do not feel having limits compared to their needs or unsolved critical aspects in the way they use technology.

5. Some conclusion and a cognitive framework for SMEs

The firms located in this traditional industrialized area do not exploit the many opportunities offered by ICT in procurement and they are quite far from being e-business oriented. What e-procurement is typically offering – and in association with SCM could be improved – is a more efficient procurement activity, more suppliers and new sourcing channels with less effort, more transparency. They are theoretically interested in those topics but they do not link the solution of their latent need to e-procurement.

There are many difficulties and constraints that limit the process of adoption and diffusion of e-procurement and the use of ICT in purchasing among SME. These factors assume different connotations. As we have seen, CEOs and purchasing managers have the power to adopt new technologies, but they do not. The most important causes are cultural and social, not technological:

- the belief that is more effective a face to face relationship than an IT supported process. This belief is corroborated by a common opinion that use of technology is useful only if it is controlled by the users and that a personal interaction can give more information about the transaction than a cold computer screen;
- the conviction that it is inappropriate to work in network with other companies, in pools or consortiums for purchasing, because is the beginning of a path leading to a loss of control on some critical management leverage;
- a general distrust in technology, that opens harmful evolutions in business that are as unpredictable and blurry as negative and irreversible;
- the perception of having satisfying information systems and ICT not being as important for business as other technologies (i.e. for production, logistic, etc.)
- in an entrepreneurial company transparency is negatively judged for its implication in term of likely fiscal controls. A similar negative opinion is embedded in procurement managers that think of e-procurement as a form of control;
- the perception that procurement is not strategic for business, so they do not invest in develop purchasing competences and, as a consequence, they feel to be inadequate to use e-procurement solutions.

Apart from these cultural factors, there are some more impeding causes for adopting e-procurement that are technological, organizational and managerial:

- their IT architectures are vertical and not integrated;
- the ICT collaboration solution they use are not suitable for structured relationship or for managing transactions;
- almost all of them are controlled and managed by an entrepreneur that has a centralized decision making style that cannot be leveraged by ICT adoption;
- they do not use procurement's planning methods but they buy mainly on demand and on contingency. For this reason they look at e-procurement as a potential compelling factor for adopting approaches they do not think to need;
- the implementation of e-procurement is perceived as expensive even if they do not have any clear idea about alternatives and their cost of adoption.

On the other hand, there are also some strengths' points on which and with whom to act in perspectives to increase the adoption rate of e-procurement solutions. The main issue are:

- endogenous and associated to the single company conditions:
 - a raising generation of entrepreneurs more favorably disposed towards ICT and more managerial approaches;
 - benchmarking with competitors and other experience in SME with competitors and other experiences.
- Exogenous and associated to external changes and stimulus:

- more fiscal control that could not be avoided by informal negotiations (e.g. the prohibition of cash payments);
- the always more frequent request by large companies for extranets or SCM integration in.

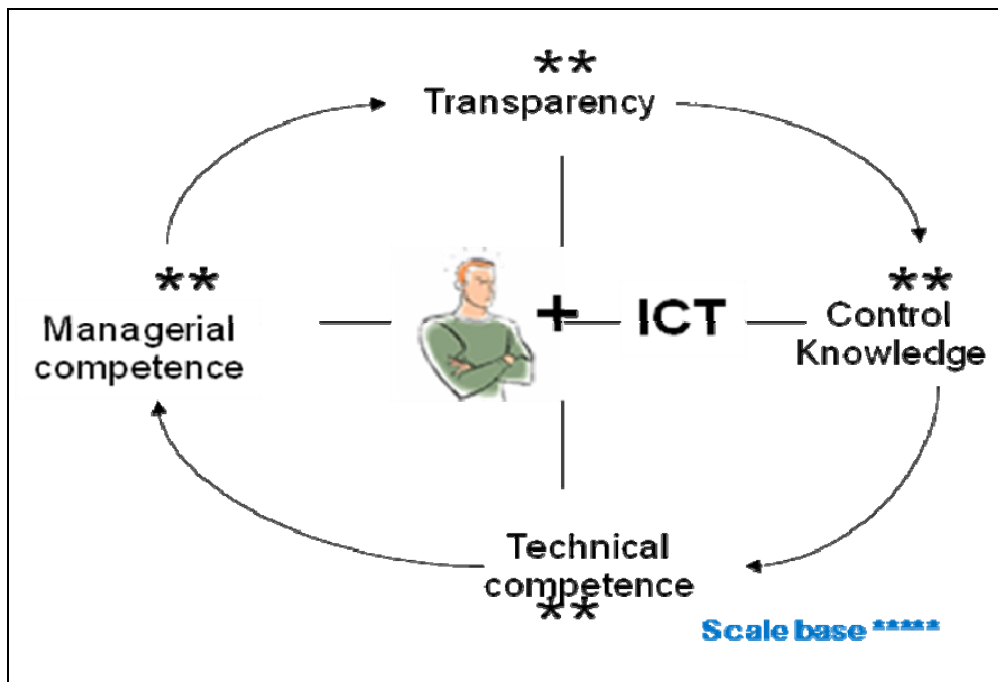
In the Fig 5.1 the state of art of the SME considered resulting by research explained in a model “virtuous” describing the factors that, with e-procurement in act jointly with a modern vision of purchasing by the persons, could raise the level of quality in the purchases and supplies.

In synthesis, considering all the aspect of our investigation, both quantitative and qualitative, e-procurement does not work:

- when the purchasing processes is simple and historically consolidated;
- where the industry supply markets are stable and in equilibrium between clients and suppliers;
- when relationships among players are based on personal knowledge;
- when there is mistrust on the effectiveness of working together (synergy for business);
- when the cultural context is not oriented to transparency;
- when the market structure is fragmented and/or formed by many small niches.

Under these conditions the likelihood of adoption fall and the potential gain that e-procurement can provide are lost. Especially for SMEs that circumstances prevent the activation of a positive feedback loop illustrated in Fig. 5.1. More investments in ICT and in e-procurement involve more managerial competence to be fully exploited and give back more transparency, both internally and externally. Being more transparent create constraints to individual and group behavior that entails the development of competencies on process control and on technical skills that could be more developed and rewarded by more managerial competences and so forth. As it often happens, positive feedback loops are always desirable, but what emerged from our research was a lack of willingness to jump in and start a virtuous development process. Our conclusion is that a natural development of e-procurement among SMEs will lead to a very long timeframe that will have a very negative on their average quality and productivity and then on their competitiveness. The only solution viable to this negative perspective in a traditional industrial area such as Varese should be an external intervention. The possible leaders of such external intervention, excluding the State, could be large companies or industrial organizations. It is on them the initiative of starting to do the right thing.

Fig. 5.1 The virtuous model for purchasing & supplies



References

- Aberdeen, G. (2005). Best Practices in E-Procurement: Reducing Costs and Increasing Value through Online Buying B2 - Best Practices in E-Procurement: Reducing Costs and Increasing Value through Online Buying. Boston, MA, Aberdeen Group.
- Baglieri, E., R. Secchi, et al. (2007). "Exploring the impact of a supplier portal on the buyer's supplier relationship. The case of Ferrari Auto." Industrial Marketing Management **36**(7): 1010-1017.
- Bakos, Y. (1997). Reducing Buyer Search Costs: Implications for Electronic Marketplaces. Management Science. **43**: 1676-1692.
- Barratt, M. and A. Oliveira (2001). Exploring the experiences of collaborative planning initiatives. Int. J. Phys. Distrib. Log. Mgmt. **31**: 266-289.
- Bartels, A. (2007). ePurchasing Software Market. Forrester Research.
- Boyle, B. A. and L. F. Alwitt (1999). Internet use within the U.S. plastics industry. Industrial Marketing Management. **28**: 327-341.
- Buvik, A. (2001). The industrial purchasing research framework; a comparison of theoretical perspectives from micro-economics, marketing and organization science. Journal of Business and Industrial Marketing. **6**: 439-451.
- Croom, S. (2001). "Restructuring supply chains through information channel innovation." International Journal of Operations & Production Management **21**(4): 504.
- Croom, S. R. (2000). "The Impact of Web-Based Procurement on the Management of Operating Resources Supply." Journal of Supply Chain Management: A Global Review of Purchasing & Supply **36**(1): 4-13.
- De Boer, L., J. Harink, et al. (2002). A conceptual model for assessing the impact of electronic procurement. European Journal of Purchasing and Supply Management. **8**: 25-33.

- Emiliani, M. L. and D. J. Stec (2004). "Aerospace parts suppliers' reaction to online reverse auctions." Supply Chain Management **9**(2): 139-153.
- Emiliani, M. L. and D. J. Stec (2005). "Wood pallet suppliers' reaction to online reverse auctions." Supply Chain Management **10**(4): 278-287.
- Essig, M., U. Arnold, et al. (2001). Electronic procurement in Supply Chain Management: An Information Economics Based Analysis of Electronic Markets. Journal of Supply Chain Management: 43-49.
- Evans, P. and T. S. Wurster (2000). Blown to bits : how the new economics of information transforms strategy. Boston, Mass., Harvard Business School Press.
- Kameshwaran, S., Y. Narahari, et al. (2007). "Multiattribute electronic procurement using goal programming." European Journal of Operational Research **179**(2): 518-536.
- Kraljic, P. and O. Sept (1993). Purchasing Must Become Supply Management. Harvard Business Review: 111.
- Kumar, N. and P. Qian (2006). "Strategic alliances in e-government procurement." International Journal of Electronic Business **4**(2): 136-145.
- Malone, T. W., J. Yates, et al. (1987). Electronic Markets and Electronic Hierarchies. Communications of the ACM. **30**: 484-487.
- Malone, T. W., J. Yates, et al. (1989). "The Logic of Electronic Markets." Harvard Business Review **67**(3): 166-170.
- McLvor, R., P. Humphreys, et al. (1997). The Evolution of Purchasing. Strategic Change. **6**: 165-179.
- Min, H. and P. Galle (2003). E-purchasing profiles of adopters and non-adopters. International Marketing Management. **2**: 227-233.
- Min, H. and W. Galle (2001). Electronic Commerce based purchasing: a survey on the perceptual differences between large and small organisations. International Journal of Logistics. **4**: 79-95.
- Morrissey, B. and L. Pittaway (2004). A Study of Procurement Behaviour in Small Firms. Journal of Small Business and Enterprise Development. **11**: 254-262.
- Patterson, K. A., C. M. Grimm, et al. (2003). "Adopting new technologies for supply chain management." Transportation Research: Part E **39**(2): 95.
- Perez, C. (2002). Technological revolutions and financial capital : the dynamics of bubbles and golden ages. Cheltenham, UK ; Northampton, MA, USA, E. Elgar Pub.
- Perkins, A. B. and M. C. Perkins (2001). The Internet bubble : the inside story on why it burst--and what you can do to profit now. New York, HarperBusiness.
- Perrings, C. and A. Ansuategi (2000). Sustainability, growth and development. Journal of Economic Studies. **7**: 19-54.
- Presutti Jr, W. D. (2003). "Supply management and e-procurement: creating value added in the supply chain." Industrial Marketing Management **32**(3): 219-226.
- Rai, A., X. Tang, et al. (2006). "Assimilation patterns in the use of electronic procurement innovations: A cluster analysis." Information & Management **43**(3): 336-349.
- Soares-Aguiar, A. and A. Palma-Dos-Reis (2008). "Why do firms adopt e-procurement systems? Using logistic regression to empirically test a conceptual model." IEEE Transactions on Engineering Management **55**(1): 120-133.
- Wheatley, M. (2003). "How to know if e-procurement is right for you." CIO **16**(17): 59.