Globalisation, E-Business and SMEs: Evidence from the Italian District of Prato*

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ABSTRACT. The paper explores how SMEs located in industrial districts explore e-business as a means to face the challenges posed by globalisation. By resorting to case studies conducted in the textile district of Prato, the research evidences the positive attitude of the interviewed entrepreneurs towards e-business. However, the characteristics of the considered products (textiles) and the district structure strongly affect the path followed to explore the scenarios opened by e-business. The collected evidence suggests that only few firms in the district are actively pursuing the full range of opportunities provided by e-business, and that isolated actions are not enough to foster collective learning and growth processes involving the whole district.

1. Introduction and background

In a context characterised by increasing globalisation, the growing involvement of SMEs in international activities is getting more and more attention by researchers, policy makers, and practitioners (UNCTAD, 1993; Audretsch, 1995; Lu and Beamish, 2001).

Theoretical and empirical studies (e.g. Acs et al., 1997) already concluded that smaller companies are sensitive to the inherent risks of international activities. SMEs suffer from internal constraints related to the scarcity of those financial, managerial and information resources needed to face the uncertainty and the risk involved in undertaking activities on a foreign market (Dunning, 1981). Nonetheless, size is not necessarily a barrier to the internationalisation of SMEs (Coviello and McAuley, 1999). Indeed, SMEs which develop and maintain ownership/competitive advantages related to the possession and exploitation of monopoly power, and the possession of scarce, unique and sustainable resources and capabilities, are likely to attempt international growth. These advantages often originate from the membership to a cluster of firms. Not surprisingly, rather than on small businesses as stand alone organisations, empirical analysis is progressively focusing on networks and clusters of SMEs, as they combine the advantages of small scale with several benefits of large scale, enhancing SMEs' productivity, rate of innovation, and competitive performances (Porter, 1998; Enright and Ffowcs-Williams, 2000; OECD, 2000).

A widely explored example of winning SMEs' network is provided by the manufacturing industrial district, a geographical cluster of SMEs characterised by common industrial culture and intense input-output interactions (see e.g. Becattini, 1998; Brusco and Paba, 1997). Firms belonging to the district benefit from a complex system of interrelationships intimately related to production systems, economic and social actors, district-specific culture, and collective learning (Camagni, 1991). However, the strengths of the industrial district in a relatively stable competitive environment might turn into weaknesses when global presence and international organisation of

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activities become increasingly needed conditions to compete. Specifically:

(i) The competitive advantage of district-located firms deeply roots in a local-specific, unique, and integrated system hardly replicable in other contexts. Accordingly, district firms might not succeed in exporting their distinctive capabilities outside the district.
(ii) The powerful inter-firm linkages and the solid relationships between social and economic forces result into a strong tendency to path-dependent growth, which favours incremental, rather than radical, changes. This may lock-in district firms, making them unable to grow and capture opportunities in different (also foreign) markets.

Previous empirical studies (e.g. Mariotti and Mutinelli, 2001) suggest that some structural characteristics of the district could help SMEs to overcome the above outlined limitations to their international growth. Specifically, the presence of local leaders, as well as the presence of foreign-owned firms within the district, have been shown to support the international expansion of the district.

However, most recently a new force has contributed to drive and motivate the international presence of district-based SMEs. The diffusion of Internet applications and, more generally, information and communication technologies (ICTs) provide smaller businesses with new tools and opportunities to expand their presence in foreign markets, as both exporters and producers. Indeed, by resorting to e-business firms may reduce the cost of information-intensive activities, such as communications management and sales and marketing. These opportunities may especially favour the international activities of SMEs by downsizing some of their historical shortcomings against larger businesses.

Moreover, given the intriguing similarity between Internet-based networks and industrial districts, these effects may prove larger for district-located firms. Indeed, the resort to Internet emphasises the chance of increasing operative efficiency by promoting networks of specialised firms (Venkatraman and Henderson, 1998). This solution somehow reflects a traditional winning feature of the industrial district: a relatively large number of highly specialised firms that achieve high product quality and flexibility through quick and effective inter-firm communication.

The paper aims at providing some preliminary evidence about the attitude of district-located SMEs towards the relationship between globalisation and e-business. In particular, the presented empirical evidence concerns the Italian textile district of Prato, i.e. a long-established district active in a traditional sector. Accordingly, the parallel increase of the international competitive pressure and the diffusion of Internet as an alternative communications channel overlap with the existing business organisation and require entrepreneurs to cope with a new competitive framework. From this point of view, the presented evidence differs from existing analyses on Internet-based firms and on the Internet-driven internationalisation of SMEs' production activities (e.g. Kotha et al., 2002; Zaheer and Manrakhan, 2002).

Specifically, the paper highlights the learning processes followed by firms in order to enter the global arena through the Internet economy. The performed analysis, based on a survey constituted by twelve case studies, shows that learning processes are taking place, and that pro-active entrepreneurs are creatively exploring the opportunities offered by Internet to promote their businesses even abroad. However, it is also clear that the transition to the Internet economy still involves a reduced percentage of potential participants, and that institutional support is crucial in order to foster a larger participation.

The rest of the paper is organised as follows. Section two puts forward the research hypotheses driving the empirical analysis. Section three recalls the main features of the district of Prato and illustrates the research methodology, while empirical findings are presented and discussed in Section four. Section five concludes the paper with some policy remarks and suggestions for the future research agenda.

2. The research hypotheses

So far, the international literature about the relationship between ICTs and SMEs' international competitiveness and growth mainly focused on the challenges and opportunities offered by e-business

(e.g., OECD, 2000), the modalities adopted by firms to approach new technologies, and the complementarities between specific industries and the features of the new electronic channel (e.g., EITO, 2000). However, as to the authors' knowledge, available evidence on SMEs' approach towards e-business is still fragmentary and sparse, both when concerning SMEs in general (e.g. Hamill, 1997; Chappell and Feindt, 1999; OECD, 1998; Bonaccorsi and Rossi, 2001; Tiessen et al., 2001; Kula and Tatoglu, 2002; Sadowski et al., 2002) and when focusing on district-located firms (e.g. Micelli and Di Maria, 2000; Rullani et al., 2000; RUR-Censis, 2001).

The empirical evidence collected in the district of Prato stems from three key questions, which respectively concern the impact of Internet and ICTs on business organisation, intra-district relationships, and relationships between the district and the "outside world".

Q1: *Which steps and which trajectories characterise the diffusion of e-business among district-located SMEs?*

Several authors underline that the diffusion of e-business among brick-and-mortar businesses tends to follow an incremental rather than a radical pattern. Since the awareness of Internet-related benefits develops through acquired experience, firms follow a step-by-step, incremental approach in exploring on-line applications (SES Canada Research, 1999). In particular, firms may initially focus on most immediately tangible e-business benefits, i.e. increased turnover via on-line sales, and only subsequently resort to on-line applications as a means to rationalise their businesses. Accordingly, firms entering the electronic arena are expected to pay larger attention to clients-oriented e-business tools, especially in the case of companies operating at downstream stages of the value chain.

In order to explain the diffusion paths of e-business applications, other authors stress the relationship between the nature of the on-line traded goods and the business model chosen to manage on-line activities (e.g., Brynjolfsson and Smith, 1999): the more standardised the traded good, the better it fits electronic transactions. On the contrary, e-commerce (i.e. on-line sales) may not represent the ultimate target of on-line activities for less standardised goods. In this case, the exploration of Internet opportunities is expected to focus on other areas of the business cycle (such as post-sale services or trade agents' fidelisation). Moreover, it has to be underlined that the previous existence of a set of organisational and physical assets limits the explorable paths, since it will incentive the selection of those solutions which minimise the need of additional investment and change.

When it comes to the introduction of Internet applications in traditional manufacturing industrial districts, the above outlined phenomena are expected to influence firms' strategic choices as follows.

- Experience drives the path followed by firms in developing on-line initiatives.
- At the beginning, on-line initiatives are mostly revenue-focused and mainly involve downstream activities. The exposition to frequent contacts with final clients makes firms more willing to explore Internet-based applications.
- The degree of products standardisation directly affects on-line sales activities.
- Implemented Internet solutions take into account the constraints posed by existing organisational and production assets, as well as by the established network of inter-firms contacts.

Q2: *Does the diffusion of Internet-based communications among district firms reinforce the beneficial network effects originally generated by geographical proximity?*

E-business may potentially assume a crucial role within the specific reality of an industrial district, as it allows existing firms to integrate the different stages of their value chain. By enabling new options, ICTs and Internet may reinforce relationships and ease information and knowledge exchanges within the district. However, a great distance exists between the ICTs at the base of e-business and the traditional background of district-located entrepreneurs. In the traditional district, competencies and know-how are often implicit and embodied into products, while communication through telematic networks requires sharing explicit, codified information. At the same

time, the district know-how focuses on translating operative intuitions into product and process innovations, while e-business also emphasises the capability to map operational, cognitive, and communication processes (Enright and Ffowcs-Williams, 2000). Moreover, the adoption of ICTs implies the resort to innovative technology suppliers, who may not share with the adopters the same "language" and culture.

Accordingly, the adoption of Internet-based applications to reshape intra-district relationships is expected to display dependence on two distinct features.

- First, the entrepreneur's cultural and technical background. More conservative entrepreneurs are expected to remain attached to traditional information sources and communication systems (as participation in exhibitions, direct contacts with suppliers and customers), while aware firms are expected to add new information channels to the traditional ones.
- Second, the degree of codification of communications among intra-district supply-chains. The higher the embeddedness of non-codified knowledge within products, the less the interest of supporting intra-district communications via Internet.

Q3: *Does the downsizing of time and spatial constraints help district-based SMEs to face the challenge of globalisation?*

E-business assumes a crucial role also in reshaping the relationships between the district firms and their outside counterparts (Rullani et al., 2000), as it allows firms to extend their competitive advantage across the district borders and to cope with the contrasting forces generated by globalisation processes. In particular, the diffusion of Internet-based applications may offer a solution to the so-called *location paradox* (Storper, 1997; Enright, 1998; Porter, 1998), which affects local economies in the globalisation era. Indeed, at the local level, globalisation processes generate both centrifugal forces, inducing exits from the local system to grab new opportunities arising in the global competitive context, and centripetal ones, sustained by possible competitive advantages rooted in the membership to a local community (Leamer and Storper, 2002).

Internet and ICTs are expected to reinforce the local nature of the traditional manufacturing district, favouring its commercial rather than direct internationalisation. In general terms, Internet-based applications potentially affect the internationalisation of both production activities and exports undertaken by SMEs (Zaheer and Manrakhan, 2002). In both cases, indeed, the resort to e-business reduces the cost of these information-intensive activities needed to manage the foreign business. However, the positive impact of e-business is more apparent in the case of international trade, since in the case of foreign direct investments SMEs still suffer from relatively higher scarcity of financial and managerial resources. Moreover, ICTs in general and Internet in particular remain still inappropriate supports to develop and distribute product-embedded tacit knowledge, which is hard to codify and transmit. For this reason, some authors (e.g. Petersen et al., 2000) highlight that Internet may not affect SMEs' crucial competencies to grow abroad, especially through foreign direct investments. Accordingly, in the SMEs-intensive context of the manufacturing industrial district, ICTs-supported internationalisation is expected to involve exports, rather than production, solving the location paradox in favour of strengthened local production activities. As stated by Enright and Ffowcs-Williams (2000): "In general, globalisation will tend to lead to the concentration rather than dispersion of economic activities if its driving forces have a greater impact on marketing than on production".

3. The empirical analysis

In order to provide preliminary evidence on the research issues outlined in the above section, an empirical analysis was performed by interviewing a selected sample of entrepreneurs in the Italian textile district of Prato. Before describing the research methodology, the present Section offers some information about the district.

3.1. *The district of Prato*

The district, located in Tuscany, includes the province of Prato, as well as some municipalities in the provinces of Florence and Pistoia. The district comprises over 8,000 firms, whose manu-

facturing specialisation includes yarn for the knitting industry, fabric for the clothing industry, textile products for furnishing, nonwaven cloths, special cloths for industrial uses, and knitting goods.

Several reasons oriented our attention towards the district of Prato. First, Prato represents the largest district all over the world: it employs almost 45,000 people, i.e. 14% of residents in the district[1] and 6.4% of total employment in the Italian textile industry.[2] In 2000, the district total turnover amounted to 4.4 billion Euros, representing 27% of the total turnover of the Italian textile industry; in the same year, the value of exported goods reached 3 billion Euros, i.e. 67% of the total district production, and 15% of the global export of the Italian textile industry. Moreover, the firms located in the district covered 20% of the world exports of wool fabrics.

Additionally, Prato is one of the oldest industrial districts: its history dates back to the XIII century and has been characterised by continuous evolution (Becattini, 2000). The current structure of the district is marked by high fragmentation of productive activities among a large number of SMEs. This situation resulted from the adaptive reaction to the changes that affected the textile markets after World War II (Becattini, 2000). The need to cope with quantitative and qualitative variability of demand in international markets induced integrated fabric manufacturers to outsource a large number of operations to local specialised smaller suppliers.

Two main categories of actors can be identified within the district: "lanifici impannatori" (fabric manufacturers) and suppliers. About 1,000 fabric manufacturers sale fabric cloths to garment makers, wholesale dealers, and buyers. Only a reduced number of "impannatori" actually own and manage integrated manufacturing activities. Processes performed by "impannatori" mainly concern the very first steps of the textile value chain (market analyses and product innovation), and the final ones (sales and marketing); their manufacturing activity is generally limited to the production of sample collections and to quality tests. However, fabric manufacturers devote large efforts to co-ordinate productive processes outsourced to suppliers. The latter comprise spinning mills, weaving mills, finishing factories, dyeing plants, knitwear manufacturers. While fabric manufacturers are more concerned with product innovation, suppliers often develop process innovations.

Finally, the attitude of local institutions represents a further reason that makes the district of Prato an interesting testbed for appraising the risks and opportunity prospected by e-business to SMEs. Indeed, public and private institutions in the district have demonstrated a noteworthy awareness of the potential impact associated to the development of the Information Society. The cabling process of the industrial district areas (RUR-Censis, 2001) also included the appraisal of the opportunity to promote a local TLCs carrier (Tocco et al., 1998). Moreover, public and private institutions have been actively co-operating in fostering on-line active participation by both firms and citizens.

3.2. *The selected sample*

The empirical analysis consists of a survey covering 12 case studies. The case studies were addressed towards innovative firms (*see infra*) of the district and were built up by interviewing the entrepreneurs running the companies. Interviews were also complemented by the analysis of the web sites managed by the selected companies.[3]

Specifically, the 12 case studies were selected as follows. Unione Industriale di Prato supplied a list of 900 companies which satisfy the following criteria:

- manufacturing SMEs;[4]
- involvement in innovation activities concerning either product, processes, strategy, or organisational innovation;
- existence of a company web site;
- commercial or productive internationalisation.

A further selection was made thanks to Pratotrade, a local producers' association which involves 140 particularly innovative firms. Out of the 45 selected companies owning a web sites, 12 accepted to be interviewed. Accordingly, the final sample includes 8 fabric manufacturers, two spinning mills, and two knitwear manufacturers.

All the interviews, which took place in February 2001, followed a semi-structured questionnaire which explored the company profile, the

relationships with clients and suppliers, the activity in international markets, the features of the company information systems, and the use of ICTs.

4. The results

The most significant data collected through the interviews are synthesised in Tables I and II: Table I depicts the profile of the sampled companies, while Table II reports initiatives in the areas of ICTs and e-business. Before interpreting the collected evidence in order to answer the questions put forward in Section 2, it may be worth pointing out some general features of the sample.

1. Most companies in the sample started their activity after 1960, thus witnessing the processes of vertical disintegration which characterised the district after World Word II (Becattini, 2000).
2. Marketing strategies greatly differ amongst different companies. Fabric manufacturers attach more importance to exhibitions than spinning mills and knitwear producers. For the former, exhibitions represent the most important source of commercial contacts, while spinning mills and knitwear manufacturers are usually directly contacted by their clients.
3. Given their closer position to end markets, fabric and knitwear manufacturers usually provide larger collections. Moreover, the collections of fabric manufacturers are usually followed by one or more "flashes" during the season, in order to better tune production to emerging fashion trends.
4. For all the interviewed companies, exports cover a remarkable share of total turnover, in line with the evidence from the overall district.

The following paragraphs aim to outline common trends in the approach of the sampled companies towards e-business in general, and as a tool for their international growth in particular. Of course, given the reduced dimension of the selected sample, evidence should be carefully interpreted and by no means extended to the whole district. Nonetheless, also basing on empirical findings from extensive quantitative analyses referred to other Italian districts (Piscitello and Sgobbi, 2002), we are persuaded that observed behaviours do not belong to outliers.

4.1. *The diffusion of Internet-based applications among district-located firms* [Q1]

Collected data clearly show that the desire to increase visibility is the main reason to build up the company web site and that the (eventual) implementation of e-commerce only takes place after some intermediate steps.[5] Specifically, following an experience curve, firms progressively add new functions and services to their web sites, from the most simple ones (on-line catalogues) to more articulated and interactive features. As a matter of fact, all the sites which offer only general information about the company products and commercial contacts are relatively recent (five sites, active since 1999). Four firms complement company information with additional services such as on-line catalogues, on-line information on products availability and delivery dates for clients and agents, or on-line order of samples, but do not offer e-commerce services. Finally, the three companies in the sample which accept on-line orders through their web site (Companies 5, 7, and 10) boast longer experience and complement e-commerce services with additional features.

Only one firm (Company 3) underlined the importance of the Internet as a source of information about raw materials prices and potential suppliers: on the contrary, all firms in the sample tended to stress the importance of the Internet as a client-oriented tool. The downstream orientation of web site holders may reduce the awareness of Internet related benefits: not only a source of increased turnover, but also a source of reduced costs, through the rationalisation of purchases. From this point of view, initiatives such as the experimental on-line stock exchange for raw materials and yarn (Borsa materie prime e filati) run by the local Chamber of Industry may serve as a stimulus to further explore the potentialities of the Internet also on the supply side.

As expected, the nature of the traded good shows a great relevance in shaping the firms' approach towards e-business. The Internet, indeed, is currently regarded simply as a complementary marketing channel rather than an alternative to the existing ones. Ten companies out of 12 recognised the nature of textile products as an obstacle to e-commerce. Indeed, the non-standard features of textiles can be properly evaluated only by direct

contact. Company 9 further stresses this argument. The firm, a spinning mill, projects to implement e-commerce solutions, but limited to raw yarn, a product characterised by standard features.

The choice to follow an incremental path in increasing the web site features crucially depends on the lack of ICTs and Internet competencies.[6] This point is clearly illustrated by Company 1, whose web site currently offers information on the firm, trade agents contacts, and an on-line catalogue. The entrepreneur declared the intention to add on-line information on delivery time and stocks availability for registered clients and agents. However, the reduced reliability of information from the warehouse was recognised as an obstacle to the additional feature. Also Company 2 pointed out the lack of required web competencies as an obstacle to implement on-line information on delivery time and e-commerce solutions.

4.2. *Internet and intra-district relationships* [Q2]

Interviewed entrepreneurs look aware of the chances offered by ICTs as a means to increase the company's efficiency through:

(i) the integration of internal processes (6 out of 12 respondents), and;
(ii) the integration of the company processes with those of far-away clients (most of examined web sites offer to the clients the chance to check the orders status and the availability of stocks). Indeed, in this case, Internet is increasingly perceived as a more efficient means of communication than traditional tools such as fax or telephone contacts. On the contrary, personal contact is still regarded as the most simple and effective form of communication within the district. As a matter of fact, only 4 companies out of 12 quoted the opportunity to integrate their processes with the local suppliers' ones as an expected benefit from the web. Two interviewed firms (Company 1 and 10) explicitly quoted the daily personal visits to suppliers as an organisational solution that, on the one hand, favours co-ordination and ensures the respect of delivery dates, but on the other one, obstacles ICT-based integration.

Apart from Company 2, all fabric manufacturers limit their manufacturing activity to the production of samples collection and to quality controls. Manufacturing activities are performed by a relatively high number of smaller suppliers, selected and co-ordinated by the fabric manufacturer. Even if to a different extent, this consideration also applies to interviewed companies in other stages of the textile value chain: only Company 9, a spinning mill, runs a partially integrated production. The high degree of labour division reflects two key success factors of the district of Prato: first, the crucial role of timely and effective communication among economic actors, which involves high reliance of district firms on their co-located suppliers; second, the importance of suppliers' competencies, given their high impact on the performance of the downstream firm. Accordingly, it is not surprising that e-business initiatives undertaken by interviewed companies develop outside rather than inside the district. E-business initiatives rely on structured information and explicit knowledge, and are therefore unfit to cope with the informal contacts required by the extensive division of labour characterising the district.

As far as the influence of the entrepreneurs' cultural background on their on-line presence is concerned, gathered data show a strong connection between the entrepreneur's attitudes towards the Internet and the projects implemented. Given the relatively small dimensions of firms, and the already mentioned lack of background in ICTs, the entrepreneur is often in charge of defining contents and functions of the company web site. For example, one of the oldest web sites examined (Company 2), established in 1997, was directly developed by the entrepreneur. The site presents various original features, such as the on-line bulletin news for the company trade agents, and the on-line order of collection samples. The last feature provides an example of "creative" use of the Internet as a means to promote the company's products also when their non-standardised characteristics hamper their on-line tradability. Potential clients are given the chance to order on-line samples up to a maximum of 20 swatches, hence reducing the length of the order cycle.[7]

TABLE I
The profile of the interviewed companies

Firm	Role in the value chain	Active since	Employees (February 2001)	Turnover (2000, Mn €)	Types of clients	Product innovation	Marketing (% of turnover)	Export	Sales network	Notes
C. 1	Fabric manufacturer	1979	36	19.37	Garment makers (90%) Wholesale dealers (10%)	150 art. per collection – 70% new entries – 30% in production	≅ 10% turnover Exhibitions Specialised journals Company web site	85% (mainly EU)	Internal trade office 16 multifirm agents	Company agents daily visit suppliers
C. 2	Fabric manufacturer (integrated production)	1972	73	36.15	Garment makers (80%) Wholesale dealers (20%)	800 art. per collection – 40% new entries – 25% in production	≅ 10% turnover Exhibitions Specialised journals	68% (EU 50%)	50 dedicated agents Trade office in New York	Emphasis on collaborative relationships with clients Product variability and role of core competencies perceived as obstacle to internationalisation of production
C. 3	Fabric manufacturer	1968	33	11.36	Garment makers (90%) Wholesale dealers (10%)	100 art. per collection – 20% new entries – 30% in production	≅ 5% turnover Exhibitions Company web site	65% (mainly EU)	Multifirm agents	Project to open proprietary trade offices abroad due to difficulties in managing multifirm trade agents
C. 4	Fabric manufacturer	1984	38	15.23	Garment makers (100%)	120 art. per collection – 50% new entries	< 5% turnover Exhibitions Company web site	60%	Multifirm agents (11 in Italy, 20 worldwide)	Emphasis on collaborative relationships with clients
C. 5	Fabric manufacturer	1952	110	56.81	Garment makers (90%) Wholesale dealers (10%)	600 art. per collection – 50% new entries	< 10% turnover Exhibitions Company web site	75%	50 multifirm agents	Emphasis on collaborative relationships with main clients and suppliers
C. 6	Fabric manufacturer	1961	39	13.94	Buyers (60%) Garment makers (20%) Wholesale dealers (20%)	150–200 articles per collection	6% turnover Exhibitions Specialised journals Company web site	70% (65% EU)	15 multifirm agents, direct management of main clients	
C. 7	Fabric manufacturer	1992	30	15.49	Garment makers (85%) Wholesale dealers (15%)	160 art. per collection – 50% new entries – 30% in production	≅ 10% turnover Exhibitions Specialised journals Company web site	50% (mainly EU)	Internal trade office for Italian and EU clients 15 agents abroad	

C. 8	Fabric manufacturer	1974	23	7.75	Garment makers (85%) Wholesale dealers (15%)	130 art. per collection – 60% new entries – 35% in production	< 5% turnover Exhibitions	70%	Multifirm agents	
C. 9	Spinning mill (partially integrated production)	1880	50	19.62	Knitwear producers (80%) Weavers (20%)	40 art. per collection – 50% new entries – > 95% in production	< 10% turnover Exhibitions Specialised journals Company web site	40% (mainly EU)	National and international multifirm agents	Make-to-order for main clients Emphasis on collaborative relationships with clients Export of know-how through internationalisation of production perceived as a risk Project to open proprietary trade offices abroad due to difficulties in managing multifirm trade agents
C. 10	Spinning mill	1966	50	11.88	Knitwear producers (75%) Impannatori (25%)	40 art. per collection – 30% new entries – 100% in production	< 5% turnover	50%	Internal trade office 13 multifirm agents	Project to open a proprietary trade office in the USA Strong relationships with main suppliers Company agents daily visit suppliers
C. 11	Knitwear manufacturer	1978	27	10.33	Wholesale dealers (50%) Large retailers (20%) Shop chains (20%) Catalogues (10%)	350 art. per collection – 80% new entries	< 5% turnover Company web site	75% (60% D)	Internal trade office Multifirm agents	Emphasis on collaborative relationships with clients
C. 12	Knitwear manufacturer	1982	10	2.06	Wholesale dealers (60%) Distrib. centres (20%) Shop chains (10%) Catalogues (10%)	150 art. per collection – 70% new entries – 30% in production	< 5% turnover	50%	8 agents	

TABLE II
ICTs and e-business

Firm	VDUs/ empl.	PCs/ empl.	LAN	ICTs to integrate firm processes	Web site since	Web site features	Projects	Notes
C. 1	0.83	0.47	Yes	No	1998	Company and agents info On-line catalogue	Information on delivery time and stocks availability for registered clients and agents. Obstacle: this feature requires the availability of reliable information from the warehouse	E-commerce hampered by products features
C. 2	0.41	0.27	No	Yes	1997	Company and agents info On-line catalogue On-line order of samples On-line bulletin news for trade agents	Information on delivery time for registered clients and agents, e-commerce. Obstacle: lack of required competencies	The entrepreneur projected the company web site
C. 3	0.55	0.52	Yes	Yes	1999	Company and agents info On-line catalogue for registered clients	No active projects	Web site initially projected as a non-interactive site Wait-and-see approach to e-commerce (recognised lack of competencies) Access to Internet restricted to managers Internet as a source of information on the costs of inputs Data exchange via Internet with on-line suppliers
C. 4	1.05	0.26	Yes	Yes	1999	Company and agents info	No active projects	ISDN Internet access Web site mainly to communicate with existing clients and suppliers New clients contacted the company via e-mail E-commerce hampered by products features
C. 5	0.45	0.14	No	Yes	1996	Company and agents info On-line catalogue Information on delivery time E-commerce	No active projects	On-line orders received from foreign clients New clients contacted the company via e-mail and contact via traditional channels followed

C. 6	0.72	0.33	Yes	Yes	1999	Company and agents info	No active projects	E-commerce hampered by products features
C. 7	0.73	0.73	Yes	Yes	1997	Company and agents info On-line catalogue Products availability for clients and agents E-commerce for registered clients	No active projects	Up to now, no on-line orders were received
C. 8	0.65	0.39	No	Yes	1999	Company and agents info	The site is currently under restructuring: projected features include on-line check of available products by the company agents	
C. 9	0.70	0.30	No	Yes In some cases, extended to suppliers	1999	Company and agents info	On-line order of samples E-commerce of row yarn, whose standardised features make them a more suitable product for on-line transactions	New clients, mainly foreign ones, contacted the company thanks to the web site
C. 10	0.30	0.30	No	Yes Data from suppliers manually introduced	1998	Company and agents info On-line orders of out-of-catalogue articles (discounts from 50 to 70% of regular prices) and raw yarn	On-line payments (currently payments for on-line orders are off-line)	Web site initially projected as an on-interactive site On-line clients are mainly Italian Access to Internet restricted to managers
C. 11	0.74	0.37	No	No	1999	Company info	On-line catalogue to complement the already existing paper catalogue	
C. 12	0.40	0.40	No	No	2000	Company and agents info Information on product availability for clients and agents	No active projects	

4.3. *Internet and the challenge of globalisation* [Q3]

The development of e-business does not seem to involve crucial changes in the relationship between the district firms and their external counterparts. Specifically, for all interviewed companies, production activities remain concentrated within the district, while trade activities span all over the world. Foreign markets absorb an important share of the output of all interviewed companies: only in one case (Company 8) exports are less than 50% of turnover. In fact, performed interviews confirmed that Internet is increasingly perceived as a tool for reinforcing the visibility upon international markets as well as the quality of the relationship with trade agents. Given the diversification of foreign markets and the difficulty of building up proprietary sales networks, multifirm agents often represent a mandatory choice for SMEs. However, the firm's products strive with competitors' products in the agent's portfolio, and various companies reported problems in managing their network of multifirm agents (e.g., Companies 3 and 9). Accordingly, a growing number of companies look at Internet as a solution to focus the attention of multifirm agents on their products thanks to a higher level of involvement.

As a matter of fact, the interviewed entrepreneurs declared that the web sites were not specifically implemented to reach new foreign clients but to improve relationships with existing clients and agents, i.e., with economic subjects with whom the company already established consolidated relationships: the entrepreneurs reported the activation of new contacts through the web site (Company 4, 5, and 9), but more as "beneficial side effects" than as pursued ones. This attitude also reflects in the features of implemented web site functions, such as on-line catalogues for registered clients (Company 3), information on products availability for clients and agents (Company 7 and 10), information on delivery time (Company 5), on-line bulletin news for trade agents (Company 2).

In order to improve the quality of their presence abroad, 4 companies declared their commitment to opening a commercial branch in a foreign country, 2 stated they are planning a joint venture with a foreign partner, and 4 reported their interest in entering international alliances or agreements. However, no company in the examined sample owns foreign direct investments: moreover, they do not contemplate such an option in the forthcoming future. The lack of interest for the internationalisation of production activities in order to increase the company's competitiveness reflects two issues.

(1) First, a strong component of tacit, uncodifiable knowledge still permeates knowledge exchanges between client and supplier in the intermediate steps of the value chain. Tacit knowledge cannot be transferred via TLCs networks, which convey information, hence codified knowledge. A relevant example is supplied by Company 2, whose entrepreneur explicitly recognised the difficulty of exporting local core competencies as an obstacle to internationalisation processes.
(2) Second, the high impact of the locally available core competencies on the quality of the final product is perceived as an obstacle to the internationalisation of production activities (Company 2). At the same time, some entrepreneurs (e.g. Company 9) explicitly indicated the export of know-how through the internationalisation of production as a threat to the uniqueness of the district capabilities.

Accordingly, e-business does not currently look as a tool able to trigger processes of internationalisation of production activities.

5. Conclusions

The present paper investigated SMEs' attitude and perception towards e-business within the context of the textile district of Prato. Empirical findings, drawn from a survey constituted by 12 case studies, highlighted some interesting answers to the three main research issues.

(1a) On-line companies believe that, despite the reduced current impact, Internet will become in the future an important source of competitive advantage. Many interviewed companies project to empower their web sites, and also sites initially conceived as non-interactive ones progressively enriched, witnessing the existence of experimental learning processes.

(1b) Most entrepreneurs perceive Internet as a client-oriented channel, whose effectiveness best display in dealing with far-away, outside-district business counterparts.

(1c) The characteristics of the considered products (textiles) remarkably affect the evolutionary paths followed by firms in exploring Internet potentiality.

(1d) Also the district structure strongly influences the entrepreneurs' choices in terms of on-line presence. Web site services must take into account existing equipment and competencies both inside and outside the firm.

(2) Empirical findings show that the cultural substrate of the industrial district represents a noteworthy restriction to the introduction of ICTs. In fact, the need for codification and standardisation of information and routines discourages the animal spirits dwelling the district, and crucial information and expertise tend to remain embodied within products rather than being codified and exchanged through newer and quicker channels.

(3) The creation and the development of knowledge and competencies is likely to remain within the real (as opposed to the virtual) district, as they are hardly reproducible on-line. For this reason, while e-business appears as a successful tool for reinforcing international trade relationships, on the contrary, it does not seem to foster any further commitment in international production activities.

The evidence has shown that only few representative firms of the district might be able to embrace the full range of opportunities provided by e-business, and to implement large projects. Indeed, some entrepreneurs' initiatives reveal the will and the capability to reap available benefits by implementing "creative" on-line services which overcome or go around existing constrains. If e-commerce of fabrics is hampered by the product features, on-line order of samples allows anyway to speed up the order cycle. If intra-district flows of tacit knowledge prevent the effective resort to the Internet with local suppliers, attention focuses on e-relationships with final clients.

Nonetheless, our conviction is that isolated actions will not foster significant collective learning and growth, possibly compromising the district competitiveness in the long run. Accordingly, the joined involvement of institutions, industrial and service firms (TLCs operators, financial institutions, etc), as well as other local actors (industrial associations, labour unions, etc), should address the harmonisation process between the current organisation model and the alternative suggested by e-business. Local institutions, in particular, are called to focus their efforts in order to turn e-business into an SMEs-friendly tool and an actual chance to open the district to outside opportunities (Oxley and Yeung, 2002). Specifically, efforts should be directed to: (i) enlighten firms to support their on-line presence through more courageous investments. In fact, so far, the bulk of existing projects pertains only to the exploitation of "cheap" virtual promotion; (ii) provide firms with the technological platforms needed for supporting their relationships, but also with the education and training tools needed to appreciate the strategic implications of the new technological opportunities.

Notes

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[1] Data come from the district official websites: http://www.ui.prato.it/distrett.html, http://www.paginetessili.it.

[2] Data source is Federtessile and Istat (http://www.cisl.it/filta/i_dati_del_settore.htm#riassunto).

[3] Additionally, in order to gain a better insight about the firms' attitude towards e-business and the Internet, we also interviewed two local suppliers of technology: Cyber.net, an ISP active since 1995, and Multidata, a supplier of information systems with 25 years of experience in the textile industry.

[4] The district also includes other types of firms, such as carriers or tool-machine producers specialised in the textile industry. However, given the preliminary nature of the research, the analysis focused on the core of the district activity, i.e. the production of textile goods.

[5] It is worth observing that a sort of selection bias may affect the provided evidence, since interviewed firms were required to own a company web site. Therefore, they already overcame the obstacles posed by the initial lack of information, awareness, and competencies.

[6] This is also the reason explaining wait-and-see behaviours for the introduction of e-commerce (e.g., Company 3), mainly

justified by the recognised lack of specific competencies and the desire to wait for a more mature attitude by clients.

[7] The interest of such a feature for the textile sector is witnessed by the fact that one of the largest ISP of Prato, Tex.net, subsequently decided to include it among the web design services offered to its textile business clients.

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