

## Project document

# Information and Communication Technology (ICT) for development of small and medium-sized exporters in Latin America: Argentina

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IDE-JETRO

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## Abstract

Despite the most recent economic crisis, Argentina continues to see an increase in the number of individuals going online, and there is optimism about the numerous entrepreneurial opportunities available. In 2002 (the peak of the crisis), the number of persons going online in the country was more than 14% higher than in the previous year.

Available figures indicate that good ideas and entrepreneurial spirit are in ample supply. Local costs for information technology (IT) personnel are lower than in other countries, while well-trained IT developers are available to participate in multinational projects.

Many Argentines are using the Internet for online banking and some Argentines living abroad access local supermarket websites to purchase food for their impoverished relatives in Argentina. The country has a high level of connectivity in the region, estimated for the end of 2004 at more than six million users, amounting to 18% of the population. While an increasing number of people are logging on, there is a continual effort to bridge the digital divide: only 5% of individuals outside the country's capital of Buenos Aires have access to the Internet.

There is strong demand for information on the part of Argentines, and this has generated a demand for technology. However, the government-supported educational systems (national, provincial, municipal) cannot adequately address this demand. Thus, though individuals are informed of the existing technology in the course of their education, they are unable to access it, creating an "abyss" between those who can afford training in tandem with their formal education and those who cannot. Loans from multilateral institutions provide for several plans to make substantial improvements in the two areas most important for reducing the digital divide: the educational system and the small and medium-sized enterprises (SMEs).

Surprisingly, the most important barrier to eliminating this divide arises from the lack of trust on the part of social groups regarding the long-term sustainability of government efforts and the lack of access to such measures. This sentiment is the result of the constant changes and habitual corruption typically associated with state subsidies.

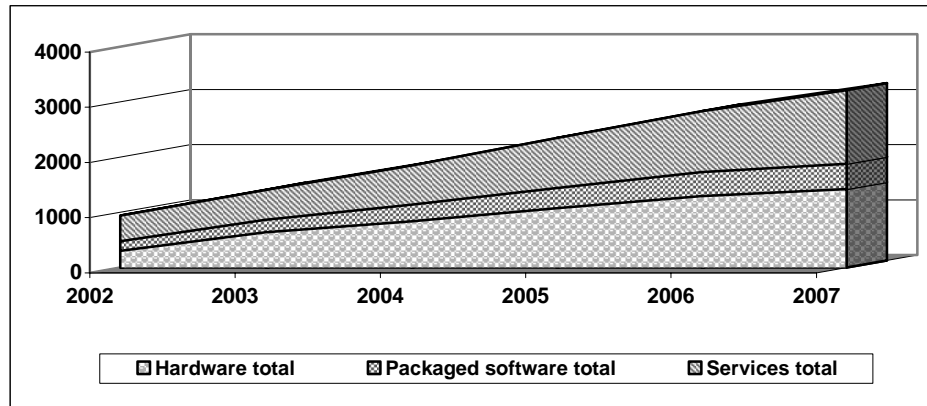


# I. Present status of the IT market and of IT usage by SMEs

## A. Market estimates

This chapter outlines the size of Argentina’s IT market, measured in annual sales for each category, in millions of dollars. The following information was prepared on the basis of surveys and market estimates developed in Argentina by Trends Consulting, using IDC worldwide definitions and methodology.

**FIGURE 1**  
**IT TRENDS**  
*(Millions of US\$)*



**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

Table 1 shows the market estimates for services activities, packaged software, hardware, storage, peripherals and networking for the period 2002-2007.

**TABLE 1**  
**IT SPENDING, 2002-2007**  
(Millions of US\$)

	2002	2003	2004	2005	2006	2007
<b>Services activities</b>						
Planning	55.1	65.5	90.1	117.6	141.2	170.1
Implementation	203.9	238.6	314.5	403.9	493.1	595.1
Maintenance and support services	134.9	151.1	183.2	224.4	269.7	324.0
Operations	56.9	69.1	96.3	126.8	160.0	194.9
Training and education	14.2	17.0	23.1	30.4	38.3	46.0
<b>Total services</b>	<b>465.1</b>	<b>541.3</b>	<b>707.3</b>	<b>903.0</b>	<b>1 102.3</b>	<b>1 330.0</b>
<b>Packaged software</b>						
System infrastructure software	56.6	72.4	95.7	118.4	140.8	148.4
Appl. development and deployment	51.4	68.4	93.1	116.4	138.5	149.3
Applications	64.9	82.7	112.4	131.3	155.5	161.3
<b>Total packaged software</b>	<b>172.9</b>	<b>223.5</b>	<b>301.2</b>	<b>366.1</b>	<b>434.8</b>	<b>459.0</b>
<b>Hardware systems</b>						
High-end enterprise servers	5.6	8.8	6.9	6.2	6.7	6.7
Mid-range enterprise servers	14.3	23.8	26.7	28.7	28.4	27.8
Volume servers	15.1	27.0	32.4	33.6	34.8	36.8
<b>Total servers</b>	<b>35.0</b>	<b>59.6</b>	<b>65.9</b>	<b>68.5</b>	<b>69.9</b>	<b>71.4</b>
Personal computers	129.4	325.2	413.8	562.6	700.0	765.5
Traditional workstations	1.9	3.8	4.5	6.0	5.3	4.0
Total clients	131.3	329.0	418.2	568.6	705.3	769.5
<b>Total systems</b>	<b>166.3</b>	<b>388.5</b>	<b>484.1</b>	<b>568.6</b>	<b>705.3</b>	<b>769.5</b>
<b>Storage</b>						
Disk systems	20.9	36.6	49.6	65.7	82.3	98.1
Tape automation	5.2	8.6	11.3	14.4	17.5	20.1
<b>Total storage</b>	<b>26.1</b>	<b>45.2</b>	<b>60.9</b>	<b>80.2</b>	<b>99.8</b>	<b>118.2</b>
<b>Peripherals</b>						
Printers and multifunction peripherals	14.5	68.5	118.3	159.0	206.5	258.6
Smart handheld devices	5.5	7.9	10.3	11.5	12.7	14.0
Other add-ons	2.5	6.3	7.9	12.9	20.0	23.1
<b>Total peripherals</b>	<b>22.5</b>	<b>82.7</b>	<b>136.5</b>	<b>183.4</b>	<b>239.2</b>	<b>295.7</b>
<b>Networking equipment</b>						
<b>Total networking</b>	<b>87.0</b>	<b>124.9</b>	<b>154.2</b>	<b>171.2</b>	<b>177.4</b>	<b>165.0</b>
<b>IT spending</b>						
Total hardware	301.8	641.3	835.7	1 071.8	1 291.6	1 419.8
Total packaged software	172.9	223.5	301.2	366.1	434.8	459.0
Total services	465.1	541.3	707.3	903.0	1 102.3	1 330.0
<b>Total IT spending</b>	<b>939.8</b>	<b>1 406.1</b>	<b>1 844.2</b>	<b>2 341.0</b>	<b>2 828.6</b>	<b>3 208.8</b>

Source: Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

## 1. IT Definitions

### a) The five IT services activity groups

- Planning

Planning consists of the assessment and evaluation of organizations' needs and operations in order to make decisions regarding their IT strategies and tactics. These activities include process improvement, operations assessment, benchmarking, needs assessment, strategy, capacity planning, management changes, maintenance planning, design, and supplier analysis.



- Implementation

Implementation refers to the building of technical solutions. At a certain point in the planning phase of a project, focus turns from concept to the actual building or prototyping of the system, and initiation/implementation of activities. Much like planning activities, implementation services are delivered as standalone activities or packaged within a larger offering, such as systems integration projects. For example, the installation of a personal computer (PC) would be considered a standalone installation service. However, a systems integration project aimed at building a new data-centre would include bundling implementation.

- Activities

This includes site preparation, project management, testing and debugging, system configuration, installation, software reengineering, custom software development, packaged software customisation, application interfacing and integration, relocation services, systems migration, documentation, and user experience design.

- Operations

These activities are aimed at taking responsibility for managing components of a company's IT infrastructure or entire IT function, as in Information Systems (IS) outsourcing. Operations activities include asset management, procurement, administration and operations, media duplication and replication, systems management, performance fine-tuning, network management, backup and archiving, and business recovery.

- Maintenance and support

This includes activities involved in ensuring that products and systems are performing properly. Support activities include IT telephone support, IT parts support, remote network monitoring, remote diagnostics, electronic support, software maintenance, onsite IT maintenance, onsite software support, and preventive IT maintenance.

- Training and education

Training and education enhance knowledge of information technology and expand its use. Training services focus on improving performance or developing new concepts, behaviours and skills. Training activities include IS/technical skills training, desktop skills training, professional IT certification, and IT learning enhancement.

## **b) Packaged software definitions**

Packaged software includes programs or code sets of any type commercially available through sale, lease or rental, or as a service. Packaged-software revenue typically includes fees for initial and continued right-to-use packaged software licenses. These fees may include, as part of the license contract, access to product support and/or other services that are inseparable from the right-to-use license fee structure, or the support may be priced separately. Upgrades may be included in the continuing right of use or may be priced separately. All of the above are counted as packaged software revenue.

Packaged software revenue excludes service revenue derived from training, consulting, and system integration that is separate (or unbundled) from the right-to-use license, but does include the imputed value of software included in a service that offers software functionality through a different pricing scheme

## c) Hardware definitions

- Servers

Data format incorporates two fundamental market-sizing techniques: units multiplied by average sales value (ASV) and the further adoption of company revenue modelling. This survey currently has detailed, reliable revenue models for Compaq (including Tandem and Digital), Data General, HP, IBM, NCR, SGI and Sun, with others under development. Some of these vendors are so large and have so many products that they do not provide highly focused server data. They will, however, comment on allocations of their publicly reported revenue. Product line revenue divided by average system pricing yields estimated unit shipments. In many cases, the accuracy of unit data is a function of the accuracy of our pricing data. Much data is still collected via traditional vendor-polling methods.

Market trends based on this information can also be applied to the vendor-modelled data to distinguish initial server shipments (ISSs) from upgrade shipments, and direct from indirect sales.

Servers are currently divided into the following major categories:

- Volume Server: \$0–99,999
- Midrange Server: \$100,000–999,999
- High-end Server: \$1,000,000 +

- Personal computers

A personal computer (PC) is a general-purpose, single-user machine that is microprocessor based, capable of supporting attached peripherals, and capable of being programmed in a high-level language. A PC typically costs less than \$12,000, but instances of higher-priced Intel-architecture PCs are included in this category. Specifically excluded from this definition are board-level products for building embedded systems or upgrading existing PCs.

Also excluded from this category are microprocessor-based, multiprocessor-capable systems; handheld computers grouped under the IDC/LINK Resources classification of Personal Productivity Partners (P3s); and single-user workstations (models from Data General, Sun Microsystems, and others). Examples of products that meet the definition of a PC include standard desktop/minitower/tower PCs, such as the IBM NetVista Hewlett-Packard e-pc c10, Apple iMac, Compaq Presario, and Dell Dimension. Other examples include mobile computer products, such as Gateway's Solo, Apple's PowerBook G4, IBM's ThinkPad, Compaq's Armada, and Toshiba's Portégé. Other examples include PC servers, such as the Acer Altos, Compaq ProLiant, and HP Netserver. The following are additional products counted as PCs:

- Computers with Power PC processors that are designed primarily to run the Macintosh OS and that otherwise meet the basic criteria;
- Any product that meets the definition of PC server, even though PC servers are not single-user devices; and
- Reduced instruction set computer (RISC)-processor systems from Acorn that are targeted at the same customer types as standard PCs.
- The following are exceptions to the PC definition:
- Small Handheld Devices (SHDs), which are counted in their own set of categories: personal digital assistants (PDAs), high-end organizers/PC companions, personal companions, pen tablets, pen notepads, keypad handhelds, and smart phones;

- Board-level devices for embedded applications or for upgrading existing PCs;
- Application-specific devices that are designed from the start for a dedicated function, such as point-of-sale (POS) terminals, automated teller machines (ATMs), and voting machines; and
- Any product, such as a terminal or network computer (NC), that is designed primarily to access information on another computer and that lacks local storage and the ability to operate without being connected to another processor.

NetPCs are counted as PCs because they have local storage and are otherwise similar to standard PCs.

- Traditional workstations

Key criteria distinguishing traditional workstations from PCs and personal workstations are the primary operating system, distribution channels, market focus, and relative functionality. In general, traditional workstations offer the following features:

- Unix or OpenVMS operating systems. This operating system is tightly coupled to specific hardware platforms and bundled by hardware manufacturers. Typically, the operating system has been developed to run specifically with a certain hardware platform, although over time it may have been ported to other hardware platforms.
- Direct sales channels supplemented by OEM and value-added reseller (VAR) distribution channels. To date, there are only limited efforts ongoing with distributors.
- Various applications. Vendors are emphasizing technical, graphics, and networked business/professional application segments (i.e., commercial applications).
- Functionality. This feature includes the highest levels of functionality in many areas, including graphics performance, floating point and integer performance, memory, and maximum disk storage.

Traditional workstations include all workstations on which Unix is the primary operating system. For example, Digital's Alpha Stations can run Windows NT; however, the systems were designed for Unix and targeted to that market. These products are included within the traditional workstation segment.

#### **d) Storage definitions**

A disk storage system is defined as a set of storage elements, including controllers, cables, and host bus adapters, associated with three or more disks drives (direct attach storage device [DASD]/hard disk drive [HDD]). A system may be located outside or within a server cabinet. Thus, nearly all storage in large, medium-sized, and small-scale servers constitutes storage systems. In addition, a considerable portion of storage within small servers is classified as a storage system.

#### **e) Peripherals definitions**

- Printers
  - Impact printers employ techniques that involve striking the final print medium, usually paper. Some use print elements (for example, daisy wheels or thimbles), chain/train or drum techniques, or hammers (for dot-matrix printing).

- Conversely, non-impact printers employ techniques that do not involve striking the paper. This category includes inkjet, and printers that employ electro-photographic (laser, LED, or liquid crystal) technologies. Electron beam, magnetic, and electro-sensitive printers also are part of the non-impact category.
- Handheld devices

These devices bring a wide range of mobile functionality to their users. Either pen or keypad centric, they are designed to access and manage data. They may include wireless capabilities that may enable Internet access, text communication, and voice communication. This category includes the following:

- Pen-based handhelds;
- Keypad-based handhelds.

#### **f) Network equipment definitions**

This category includes the following list of products:

- LAN Switches.
- LAN Hubs
- Converged Branch Exchanges
- PC Connectivity
- Data-centre Network Infrastructure
- Wide Area Network Infrastructure, including Remote access concentrators, routers, optical network infrastructure, integrated access devices (IADs), ATM, frame relay, and inversion multiplexing (IMUX).
- New World Voice Network Infrastructure, such as Soft-switches, Gateways, Broadband Access Network Infrastructure, Digital Subscriber Line.

#### **g) E-business definitions**

- The Internet

The Internet is the TCP/IP-based interconnection of servers worldwide. It provides communication and application services to an international base of business, education, research, government, and other organizations, as well as individuals. The Internet Society loosely governs it, with standards developed by the Internet Engineering Task Force. Other volunteer groups and vendors also support the Internet.

- Internet buyer

An Internet buyer is a person who commits to purchase a product or service from a potential seller by clicking an order button on the Internet, representing a commitment to transfer funds in exchange for the goods or services.

- Commerce

Commerce is the process by which an order is placed or accepted, therefore representing a commitment for a transfer of funds in exchange for goods or services. The measure of commerce includes the value of final goods/services purchased for consumption by consumers/businesses (e.g., a car) and the intermediate goods/services purchased by businesses to be incorporated into product offerings (e.g., tires purchased and resold as part of a car by an auto manufacturer). Commerce is not measured in ICM version 9.1; it is defined here for reference.

- E-commerce

E-commerce is the process by which an order is placed or accepted via the Internet (i.e., a buyer clicks an order button on the Internet), therefore representing a commitment for a transfer of funds in exchange for goods or services. E-commerce is a subset of Internet-assisted commerce. E-commerce does not include the following:

- Non-Internet electronic commerce, such as orders placed by fax
  - Orders placed via e-mail, even if the e-mail system uses the Internet. (This is because the commitment for a transfer of funds required by e-commerce does not occur via e-mail today. E-mail typically represents intent to commit, but a contract or purchase order [PO] must be sent and signed outside the e-mail system for commitment. E-mail commerce will count as e-commerce if there is a digital signature that satisfies the commitment of a transfer of funds.)
  - Electronic data interchange (EDI) transactions that do not use a Web-enabled gateway as a front end of the EDI system.
- Business-to-consumer e-commerce

B2C e-commerce is the value of products/services purchased by individuals by clicking order buttons on the Internet and intended for consumption by themselves, family, or friends. B2C e-commerce is a subset of e-commerce.

Business-to-business e-commerce. B2B e-commerce is the combined value of business end-use e-commerce and business supply chain e-commerce. B2B e-commerce is a subset of e-commerce.

Table 2 shows the market estimates for e-commerce in Argentina for the period 2002-2007.

**TABLE 2**  
**E-COMMERCE, 2002-2007**  
(Millions of US\$)

	2002	2003	2004	2005	2006	2007
<b>E-commerce</b>						
Business to business	55.2	99.0	155.6	210.1	78.5	471.5
Business to consumer	226.7	353.5	544.9	808.6	1 108.8	1 729.7
<b>Total e-commerce spending</b>	<b>281.9</b>	<b>452.6</b>	<b>700.5</b>	<b>1 018.6</b>	<b>1 187.2</b>	<b>2 201.2</b>

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

## **B. Penetration of IT (PC, Internet, etc.) and e-commerce (sales, procurement, etc.) by SMEs**

This study analyses the status of the Information Technology (IT) market in small- and medium-sized enterprises in Argentina, defined as those companies with fewer than 500 employees (micro-enterprises –less than 10 employees– are not included). The incorporation of IT in this segment of the corporate market is a dynamic process with a behaviour that differs according to the type of company and sub-market.

First, the uses and trends in the way that SMEs administer the resources they allocate to support IT technology and functions used in their businesses are analysed. The result describes IT practices in this segment as a consequence of the analysis of SME demand, and in particular the resources allocated to the IT area in terms of budget and organization.

Aspects investigated include:

- Modality used for the development of applications;
- The most important projects currently under way;
- The attitude of SMEs to new technologies and problems of interest in world markets (Internet, security, storage).

(i) *Methodology*

Fieldwork, involving interviews with those responsible for IT-function decisions, was carried out in a significant number of SMEs established in Argentina. For the purposes of this research: SMEs are companies with a staff of fewer than 500 (excluding factory workers). Fieldwork was carried out in the first quarter of 2004. By that time of the year most of the companies interviewed had already formulated their budgets and operating plans for the year. Information was obtained through personal interviews. Data were added from public sources as well as from our own databases, obtained from other research efforts. A structured questionnaire was used as the basic data collection tool. Replies were guided by means of options and were completed with comments. Spontaneous and solicited comments were collected and processed to enrich the qualitative analysis. A total of 84 companies were interviewed.

In order to analyse the replies, the companies interviewed were classified and grouped in seven vertical markets. The categories included in each of the vertical markets were as follows:

- Process industries (Process Manufacturing, Resource Industries. Excludes Food and Tobacco Industries);
- Other industries (includes Discrete Manufacturing, Food and Tobacco Industries);
- Commerce (includes Wholesale Segment and Retail Segment);
- Finance (includes Banks, Finance, Insurance);
- Utilities (includes Electricity, Water, Gas, Utilities, and Communications and Media);
- Other Services (includes Corporate Services, Health and Transport and Transport Services);
- Others (includes Central Governments, Education and Construction).

In addition, results are shown with the market segmented according to company size on the basis of annual sales, as follows:

- < 100 million \$ (pesos)
- 101-500 million \$
- 500 million \$

Data were processed for 84 SMEs with sales averaging \$242.3 million in 2002 and \$282.2 million in 2003. The major findings include the following: (i) The increase in average sales for the year was 16.5%; (ii) total sales for all companies analysed in 2003 were in excess of \$23.7 billion; (iii) the IT function budget shows that each of these companies spent \$3.2 million in 2002; (iv) total spending on IT by the companies covered by this study is close to \$270 million; (v) during 2003 this figure increased by 9.4%, equivalent to an average spending on IT of \$3.5 million; (vi) the relationship between IT spending and sales volumes is an important indicator used by the companies themselves as a measure of the efficiency of their IT investments;

(vii) analysis of IT budgets and levels of sale of Argentine SMEs indicate that IT spending averages 2.7% of sales; and (viii) this average is almost one percentage point higher than the average IT spending by all Argentine companies (1.8%), in an analysis that includes large companies (those with over 500 employees).

This value varies significantly according to the vertical market being analysed, as can be seen in table 1. A total of 38.9% of company IT budgets covered by this analysis is assigned to the payment of salaries of internal resources (personnel, maintenance of own installations). The remaining 61.1% is used to pay for products and services contracted from external third parties. The percentage of IT budgets assigned to payment for external products and services has been rising without interruption in recent years. This trend will be maintained. In 2004 the portion of the budget allocated to the contracting of external resources and services will again rise until reaching 61.8% of the IT budget. IT spending by Argentine SMEs can be broken down as follows:

- 28.6% on hardware;
- 22.6% on software;
- 21.7% on communications (excluding voice); and
- 27.1% on services.

Comparing these percentages with the same figures for all Argentine companies (including large corporations), the following conclusions can be reached:

- They spend LESS on HARDWARE;
- They spend a similar percentage on SOFTWARE;
- They spend MORE on COMMUNICATIONS (excl. voice); and
- They spend LESS on SERVICES.

9.6% of SMEs (excluding factory workers) are deployed in IT areas, distributed as follows:

- 74.6% company payroll;
- 25.4% external personnel contracted on a fairly regular basis to supplement the company's own personnel.

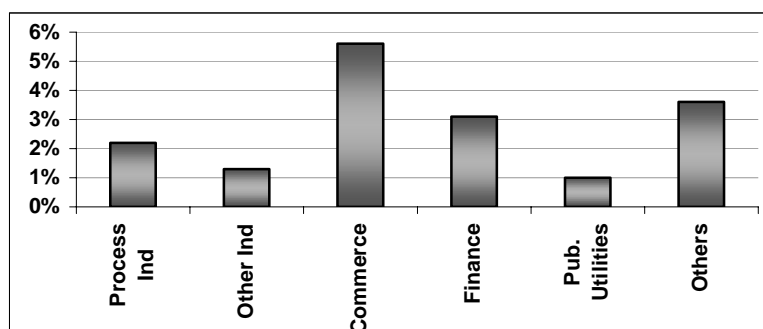
On average the functional distribution of IT personnel is as follows:

- 40.6% carry out operating tasks (Processing, Data Administration, Storage Administration, User Support);
- 36.2% are involved in Software Applications and Development;
- 14.1% perform technology support functions (System Programming, Capacity Planning, DB Administration, Security); and
- 9.1% carry out other functions (Management, Administrative Support).

There have been very significant changes in the Argentine economy in recent years. It has become difficult to make decisions within companies without a critical analysis that justifies the need and usefulness of maintaining IT spending or incurring new costs. For this reason, analysis of the destination of investments in new projects is an important indicator of the state and use trend for IT in companies.

Viewed on the basis of the size of the investments planned, companies assign more importance to investment in enterprise, resource-planning (ERP) applications (the projects that demand the most resources). This investment is followed by investment in corporate websites, intranets and extranets, and then by investment in Business Intelligence, and lastly, the migration to and/or installation of Operating Systems and the Development of specific Vertical Applications for each business (this latter point is evaluated differently in each vertical market).

**FIGURE 2**  
**INVESTMENT IN IT BY VERTICAL MARKET**  
**IT SPENDING AS % OF COMPANY SALES, 2003**  
*(Percentages)*



**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

(ii) *Application software*

- ERP

Some 93% of Argentine SMEs already had an ERP solution installed in 2003. Although the number of CRM and SCM installations is rising, their presence and use by SMEs does not yet reach half the percentages of ERP. In 2003 these two applications each had a penetration of close to 40%. SAP, Oracle and J. D. Edwards, in that order, are the ERP solutions most frequently chosen by the corporate sector in Argentina overall. The three together account for over 52% of all companies. Nevertheless, numerous enterprises complement their solutions with their own developments, particularly in the SME segment. Companies cannot find all the functions they require in a single product, so they acquire modules from different sources and undertake their own developments to complete the functions they require.

- CRM

Analysis of presence by vertical market indicates that companies in the Finance and Process Industry sectors are those that have most CRM installations. There is also significant use on the part of Public Utilities. Companies in the Commerce segment make the least use of this application. The use of SCM is most prominent in Process Industries and Other Services. During 2003 the number of applications installed increased, the largest rise being in CRM in SMEs (with a 41% increase in the number of companies). The CRM solution vendors with the largest presence in the market analysed are: Peoplesoft, Telesoft and Siebel. Oracle and Microsoft provide most of the databases for CRM.

- Human resources

Some 68% of SMEs have Human Resources Applications installed, in addition to traditional payroll calculation systems. In general terms, the sectors for which growth in the number of companies with Human Resources applications has been most significant have been Commerce and Utilities. This growth has been comparatively greater among smaller enterprises. Meta 4, Peoplesoft and SAP (in that order) stand out as the leading providers of Human Resources systems because of the number of companies in which their solutions are installed.



(iii) *E-commerce, e-procurement*

E-commerce, e-procurement and business portals have a very low level of penetration in the market analysed. In the opinion of the major consulting firms, the potential for future growth represents an opportunity for vendors of these products.

Slightly under 1/3 of Argentine SMEs had active business portals at the end of 2003. The percentages of companies with e-commerce and e-procurement solutions were lower in December 2003: 24.2% and 8.4% respectively. Although these volumes of penetration are still low, the increase compared to 2002 is considerable. In 2003 there was an increase in the use of these applications by small- and medium-sized companies, especially in e-commerce by small companies, and in e-procurement among medium-sized enterprises. Companies in the finance sector have experienced major developments in terms of business portals and e-commerce, while there has been significant growth in “home banking.” Industrial segments stand out as users of e-procurement, with utilities in second place.

(iv) *Collaborative software*

A significant number of companies make use of their own developments for e-commerce. Vendors of solutions for this business have not yet managed to develop a broad customer base, particularly in the SME market. As might be expected, e-mail represents the widest use of Collaborative Software, with a penetration of 98.8% of all companies. Schedule is used by 73.5% of companies. Although the presence of the remaining applications is lower, there is a rising trend in their use. Growth in the number of SMEs using collaborative software has been significant between the end of 2002 and the end of 2003:

- Although penetration was low in 2002, the number of companies incorporating unified messaging solutions grew by 59.3%.
- A similar situation has existed in relation to companies incorporating conferencing solutions. In this case the increase was 44.2%.
- There was an increase of 41.7% in companies using document management applications.
- Among solution vendors, Microsoft stands out as a provider of Unified Messaging and Schedule, and IBM as a provider of Document Management and Scheduling applications.

(v) *Decision-making support software*

The Argentine SME market includes only a few installations operating with Data Access and Decision Support Software, such as Data Mart, Data Mining, Data Warehouse, Enterprise Information Systems (EIS) and On-Line Analytical Processing (OLAP), but many companies are installing such products and tools.

The outlook for this market is promising. In 2003 the number of companies with Data Mining doubled, with a penetration of 25.3%. Some 26.5% of SMEs have Data Mart solutions, 63.9% use Data Warehouse applications, 44.6% use OLAP and 32.5% use EIS. Growth rates are reminiscent of other periods. As of December 2002, Process Industries companies led the way in the use of DW, EIS and OLAP, while Public Utilities made the greatest use of Data Mart/Data Mining. The smaller presence of Finance companies represents a challenge for the vendors to demonstrate their advantages. Based on the stated intentions of users, the outlook is favourable. The aim of companies in the sector is to develop the use of Decision support software. Oracle appears as the main vendor of DW and Data Mart applications, sharing the lead with Microsoft and Data Mining. No dominant vendors have been detected in regard to the remaining tools.

**(vi) Hardware**

Definitions related to hardware use and usage trends in companies have been made on the basis of analysis of the current and future status of the following items:

**Servers:**

- Mainframe
- AS/400
- Other IBM Servers
- HP Servers
- Sun Servers
- Dell Servers
- Other Intel Servers
- Non-Intel Servers

**PC equipment:**

- Desktop PCs
- Notebook PCs
- Mobile devices (Palmtops)
- Desktop printers

There will be no significant changes in the number of servers installed in local companies in 2004. This is a further indication of the IT spending restrictions currently affecting corporate budgets.

Among different brands, HP/Compaq has the greatest presence in the SME market. Some 85% of SMEs use HP or Compaq servers. IBM is the next-most popular brand: 81% of companies have IBM servers (AS/400, RISC or Intel). AS/400 servers continue to have a significant presence in the local market, with 40% of companies using this type of server. Though only recently gaining a presence in the local market, Dell servers have recorded the highest growth in 2003 in Argentine companies overall. The number of companies using Dell servers increased by 50% of the installed base that existed at the end of 2002. Analysis of the SME segment shows Dell with a low presence.

Overall analysis regarding the purchase of PC equipment reveals a reduction in the number of companies planning to add new equipment, although there is one element that indicates a significant growth in total market volume. The critical situation in companies has limited the acquisition of additional technology. Nevertheless, excluding the “don’t know” responses, over two-thirds of companies have invested in PCs and notebooks during 2002. However, excluding mobile devices, the number of units to be added in 2003 increased compared to 2002, leading to a significant volume of equipment to be incorporated. The average for PC Desktops in Argentine SMEs totalled 36.9 in 2003 and 22.1 in the case of PC Notebooks.

Local market penetration by mobile devices has been confirmed to be low, and there are no expectations of any change in the short term. From an average of 34.5 in 2002 the figure dropped to an average of 22.1 in 2003. The average for desktop printers also fell, from 26.8 in 2002 to 14.3 in 2003.

**(vii) Internet**

Definition of the use of Internet in companies has been made on the basis of the current and future status of the following items:

- Corporate website
- Intranet
- Extranet
- B2B
- B2C
- Security

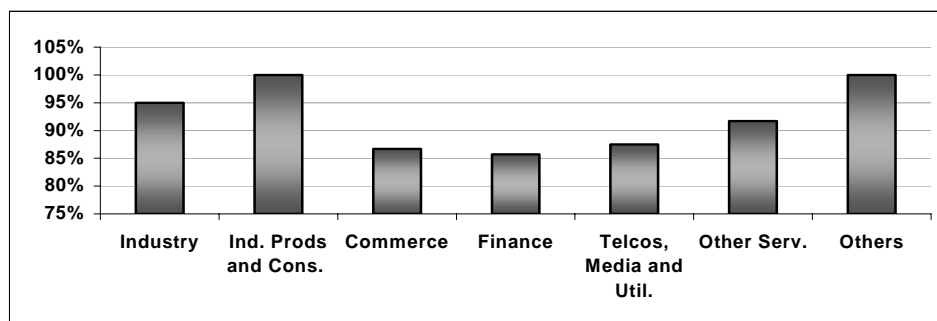
Approximately 84% of Argentine SMEs had a corporate website in 2002. This figure increased to 90% at the end of 2003. Analysis of SMEs on the basis of the vertical market to which they belong indicates the corporate website ownership (Figure 3).

As to the type of service used to host the corporate websites, 48% of companies host their sites on their own servers, 36% use hosting services from local providers, 12% locate them at their foreign headquarters and only 4% use the services of local hosting providers (Figure 4).

No dominant hosting providers were identified. There are numerous providers serving a reduced number of corporate clients. Impsat and Comsat stand out as having the greatest penetration among hosting providers serving the Argentine SME market. Some 72% of SMEs operate a corporate intranet, but only 38% have extranet. Some 73.5% indicate that they operate security and data protection solutions.

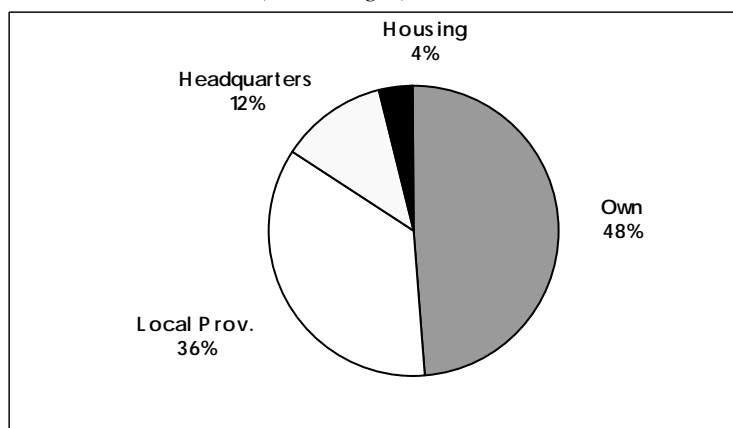
The availability of Internet and/or e-mail navigation facilities for company employees continues to increase from year to year. At the end of 2003, 52% of employees were able to use Internet and 83% were equipped to use e-mail. These figures represent an increase over 2002 of 4% in the case of navigation and 1% in the case of e-mail.

**FIGURE 3**  
**CORPORATE WEBSITE BY VERTICAL MARKET, 2003**  
(Percentages)



**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

**FIGURE 4**  
**HOSTING OF CORPORATE WEBSITES, 2003**  
(Percentages)



**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

Impsat is the principal provider of Internet access for SMEs. In addition, its penetration is the highest in all three groups of companies: large, medium and small. Comsat, Telecom Argentina and Tectel follow it in order of preference.

The list of critical projects identified as being of greatest importance for the operation of SMEs includes topics related to technology and services developed on the Internet, in particular Security, Extranet and websites. Nevertheless, the greatest spending has involved the updating and maintenance of other areas, such as ERP and Human Resources applications, followed by the Development and Maintenance of specific Vertical Applications for each business. It is plausible to consider that as restrictions on IT budgets decline, the unmet demand in relation to technology and services developed on the Internet will be taken into account in IT budgets in subsequent years.

(viii) *E-commerce practices*

Only 21.7% of Argentine SMEs have developed some type of business-to-business (BTB) solution. The penetration of business-to-consumer (BTC) is even smaller: 14.5%. Table 3 shows the most significant values characterizing the development and penetration of Internet and e-commerce in the Argentine corporate market.

**TABLE 3**  
**PENETRATION BY PC, INTERNET AND E-COMMERCE IN THE SME MARKET**

	2001	2002	2003
Installed base of PCs in SMEs	895 905	904 153	907 456
Total installed base of PCs	3 113 043	3 126 710	3 140 378
% of SMEs/total market	28.8	28.9	28.9
Internet access devices in SMEs	57 564	63 114	80 755
<b>Total Internet access devices</b>	<b>163 150</b>	<b>174 861</b>	<b>226 728</b>
Mobile phone devices in SMEs	203 648	213 831	286 533
<b>Total Internet devices in SMEs</b>	<b>1 157 117</b>	<b>1 181 098</b>	<b>1 274 744</b>
<b>Total Internet devices</b>	<b>4 633 849</b>	<b>4 768 112</b>	<b>5 372 931</b>
	<b>25.0%</b>	<b>24.8%</b>	<b>23.7%</b>
Devices using Internet in SMEs	536 585	541 272	617 417
% Total devices using Internet in SMEs/ total Internet devices in SMEs	46.4	45.8	48.4
Internet users in SMEs	537 607	544 159	691 812
Total Internet users (unadjusted)	3 326 892	3 932 838	4 246 397
E-commerce in SMEs (\$)	677 839 551	338 958 302	500 382 104
<b>Total e-commerce (\$)</b>	<b>1 567 744 722</b>	<b>876 762 062</b>	<b>1 353 177 148</b>
	<b>43.0%</b>	<b>39.0%</b>	<b>37.0%</b>
B2B in SMEs (\$)	664 727 102	328 674 876	491 546 919
<b>Total B2B (\$)</b>	<b>1 454 859 013</b>	<b>704 937 441</b>	<b>1 057 092 589</b>
B2C in SMEs (\$)	13 112 448	10 283 426	8 835 185
<b>Total B2C (\$)</b>	<b>112 885 709</b>	<b>71 824 621</b>	<b>296 084 559</b>

Source: Trends Consulting, 2004.

## II. SMEs' development in the IT revolution

### A. Overview of the relative importance of SMEs capital in the overall economy

It is not easy to formulate what should be considered to be an SME in Argentina. The Undersecretariat of SMEs and regional development definition of SMEs is as follows:

- Micro: up to \$ 1,800,000 annual sales (approx. US\$ 600,000)
- Small: from \$ 1,800,000 to \$10,800,000 (approx. US\$ 3,600,000)
- Medium: from \$10,800,000 to \$86,400,000 (approx. US\$ 28,800,000)

On the other hand, the Federal Council on Investments (*Consejo Federal de Inversiones*) defines SMEs as companies with up to 100 employees. For the Central Bank and other regulatory agencies, it is as follows:

**TABLE 4**  
**SMES DEFINITIONS ACCORDING TO THE CENTRAL BANK OF ARGENTINA**

Limits according to sector	Industries, Mining and Fishing (millions)	Commerce and Services (millions)	Transportation (millions)	Agriculture and Livestock (millions)
Employees	300	100	300	0
Annual Sales	\$ 18	\$ 12	\$ 15	\$ 1
Approximately	US\$ 6	US\$ 4	US\$ 5	US\$ 0.333
Productive assets	\$ 10	\$ 2.5	0	\$ 3
Approximately	US\$ 3.3	US\$ 0.833		US\$ 1

**Source:** Trends Consulting, 2004.

According to the National Economic Census of 1994, the number of SME's is divided as shown in the following tables:

**TABLE 5**  
**MANUFACTURING INDUSTRIES**

	<b>Number of companies</b>	<b>% of the total</b>	<b>% of the Added Value</b>	<b>Number of employees</b>	<b>% of total employees</b>
1 to 3 employees	52 269	58	4	89 147	9
4 to 25	31 450	35	17	271 026	27
26 to 50	3 189	4	10	112 823	11
51 to 150	2 271	3	19	189 874	19
<b>Subtotal</b>	<b>89 179</b>	<b>99</b>	<b>50</b>	<b>662 870</b>	<b>66</b>
More than 150	909	1	50	345 039	34
<b>Total</b>	<b>90 088</b>	<b>100</b>	<b>100</b>	<b>1 007 909</b>	<b>100</b>

**Source:** National Economic Census 1994, INDEC, Ministry of Economy, Argentine.

**TABLE 6**  
**COMMERCE**

	<b>Number of companies</b>	<b>% of the total</b>	<b>% of the Added Value</b>	<b>Number of employees</b>	<b>% of total employees</b>
1 to 3 employees	453 297	90.04	32	652 552	58
4 to 25	47 582	9.45	42	330 951	29
26 to 50	1 701	0.34	10	58 804	5
51 to 150	613	0.12	7	42 254	4
<b>Subtotal</b>	<b>503 193</b>	<b>99.95</b>	<b>91</b>	<b>1 084 561</b>	<b>96</b>
More than 150	239	0.05	9	45 162	4
<b>Total</b>	<b>503 432</b>	<b>100</b>	<b>100</b>	<b>1 129 723</b>	<b>100</b>

**Source:** National Economic Census 1994, INDEC, Ministry of Economy, Argentine.

**TABLE 7**  
**SERVICES**

	<b>Number of companies</b>	<b>% of the total</b>	<b>% of the Added Value</b>	<b>Number of employees</b>	<b>% of total employees</b>
1 to 3 employees	252 625	83	27	337 050	25
4 to 25	43 474	14	25	371 816	28
26 to 50	3 423	1	9	121 265	9
51 to 150	1 859	1	10	132 326	10
<b>Subtotal</b>	<b>301 381</b>	<b>99</b>	<b>72</b>	<b>962 457</b>	<b>73</b>
More than 150	1 532	1	28	364 263	27
<b>Total</b>	<b>302 913</b>	<b>100</b>	<b>100</b>	<b>1 326 720</b>	<b>100</b>

**Source:** National Economic Census 1994, INDEC, Ministry of Economy, Argentine.

The Association of SME's (APYME) indicates that the SMEs currently represent 95% of the total productive firms and 65% of employed persons (unemployment 14.4%, underemployment and social plans 15%) (see APYME website).

More details may be obtained from a February 2003 IDB study of medium-sized companies (based on the Bank's definition of such companies).

**TABLE 8**  
**RANGE IN TOTAL SALES**  
**US\$ 24 MILLION TO US\$ 200 MILLION, REPRESENTATIVE SAMPLE**  
*(Millions of US\$)*

Economic sector	Number of firms	Total sales	Average sales	Number of firms exporting
Agriculture and livestock	31	1 847	60	16
Commerce	160	10 321	64	43
Construction	23	1 689	73	6
Industrial	265	16 008	60	120
Mining	2	107	54	0
Services	178	12 134	68	19
<b>Total</b>	<b>659</b>	<b>42 016</b>	<b>64</b>	<b>204</b>
Economic sector	Number of firms exporting	Total exports	Average exports	Export/Total Sales (%)
Agriculture and livestock	16	521	33	28
Commerce	43	943	22	9
Construction	6	175	29	10
Industrial	120	2 528	21	16
Mining	0	0	0	0
Services	19	362	19	3
<b>Total</b>	<b>204</b>	<b>4 529</b>	<b>22</b>	<b>11</b>

Source: IDB, February 2003.

According to public statements by Roberto Lavagna, Minister of Economy (Day of Industry, 26 August 2004), exports will amount to US 33.5 billion dollars this year, with an encouraging 13% of exports during the first semester accounted for by SMEs. Last year, SMEs accounted for only 10% of the total. This gain is significant, since the total volume of exports will have a net positive gain of US 3.9 billion dollars this year. If one considers only industrial exports, SMEs have an even greater share, representing 20% of the total. Another important consideration is the increasing number of SMEs exporting products: in 2003, two thirds of exports were carried out by such firms.

According to an internal paper of the Ministry of Foreign Affairs, during the first half of 2004, there were 8,700 SMEs involved in exports. Moreover, the study indicated that 40% of total exports to Korea were carried out by SMEs, while for Taiwan (Province of China) this figure was 56%.

## **B. Case studies on use of e-commerce and supply chain management**

### **1. Córdoba Technology Cluster (CCT)** ***(Polo Tecnológico de Córdoba)***

The CCT is a civil organization located in the Province of Córdoba, in the centre of Argentina. It was established in February 2001, and is made up of technology firms located in Córdoba. These firms decided to form a cluster in order to create competitive conditions for exports and to promote the internationalization of local software products, while fostering alliances and encouraging stronger integration with larger technology firms abroad.

The CCT is closely related to the “Programme for the Development of Productive Chains,” and was conceived as an integrated effort by the City of Córdoba Development Agency, the Córdoba Science Agency and the Foreign Trade Chamber of Córdoba, and is partially funded with technical cooperation funds from the Inter-American Development Bank.

The external funds are from the Multilateral Investment Fund MIF/AT 511. The objective of the project is to improve the productivity and economic development of small businesses in the province of Córdoba through joint actions designed to strengthen business cooperation, and to raise the level of productive efficiency and commercial capacity by creating a group of businesses in the informatics, electronics and high-technology sectors, as well as a group concerned with furniture and agro-industrial products. The MIF funds total US 1,082,640 dollars.

The CCT was the first attempt to set up a Productive Collaboration Association for the software industry. Following this initiative, other technology clusters have emerged in Argentina, e.g., in Rosario, in the Provinces of Córdoba and Tandil, in the Province of Buenos Aires.

This concept arose as an attempt to create a cluster centred on a group of innovative local firms attempting to expand its activities by using innovation as a tool for gaining a competitive advantage. As a result of conversations with government authorities, they became increasingly aware of the importance of major multinational firms. The provincial government granted multinational firms a number of tax advantages: tax exemptions, land at concessional prices, and other incentives. The most important multinational companies in the sector already had a commercial presence in Córdoba and, as a consequence, could serve as a channel for disseminating information concerning a potential cluster.

Historically, Córdoba has been a culturally developed province with a significant number of high-quality university graduates. Well-trained human resources were available, though certain career changes would be required to meet the current personnel needs. The supply of trained human resources and the announced investments were a central issue for attracting suppliers of collateral services and technical support institutions. Given Córdoba’s particular cultural patterns, including the practice of sharing business among two or three companies (often a single company may be unable to handle a large volume of business), the cluster concept has been relatively easy to promote.

Regional public policies implemented during the last 10 years produced favourable conditions for developing an advanced IT environment at the national level. This could be seen particularly in the active efforts of provincial authorities to support the creation of a technology cluster.

### **a) Commitments**

A cluster’s success depends largely on strong commitment on the part of its members. In this case, the founders established certain common criteria, to be applied regardless of the particular firm carrying out a given business.

These criteria can be summarized as follows: The main business activities are to be located in Córdoba; thus, a company could have activities outside the province of Córdoba, but its core operations must remain in Córdoba. This principle has been applied with considerable flexibility, but the important point was the emphasis on encouraging the development of business activities in Córdoba.

Another widely applied principle was the internationalization of activities. All of the founders have been involved in exporting some of their products or services. The most difficult criterion involved limiting individual interests and fostering a culture of partnership and cooperation, without endangering local competitiveness. The last part of this principle was subject to challenge in cases where a group had influence within a particular geographic area.



The Founders made the decision that an expansion in the overall mass of business would provide the best opportunity for the cluster's success, and therefore invited other actors – public and private – to be involved in developing the cluster project.

A strong commitment was made to create a technology cluster centred on innovation and ongoing improvement as a basis for continued survival. The development of the cluster's programs was focused on this challenge. In a country in which a single city (Buenos Aires) played a dominant role within the nation as a whole, this was used as a reference point for gaining support on the IT projects. A proactive attitude was adopted at the institutional level, and efforts to monitor the cluster's progress were implemented.

## **b) Framework**

In order to establish a cluster, it is necessary to construct a space in which constant feedback and complementarities are present. Clusters have been found to be the best means of developing competitive advantages. The experience of a given member can be analyzed and utilized as a knowledge base for the overall group; at the same time, the quality of the information gains in value through this process.

Doing business in a global economy requires overcoming numerous restrictions normally faced by insulated firms. Regional groupings provide an added value for integration in a global economy, given that members share much in common in carrying out their activities. Innovation is a key factor in gaining market share, but resources typically are limited for SMEs. Innovation through common activities is the one way to gain commercial advantages. Furthermore, competitive advantages are sustainable only if permanent improvements are introduced in the market. Thus, a comprehensive approach toward projects of common interest needs to be developed. Rivalry among competitors (members of the cluster) stimulates them to seek competitive advantages, with circumstances acting to differentiate the firms. As the cluster evolves, members focus increasingly on international strategies, since an internationally competitive cluster has the greatest chance of success.

## **c) Vision of the government's role**

The government must take an active role in assuring the cluster's success, since small markets such as Argentina lack the volume to justify certain investments. Access to other markets may be affected by various types of barriers.

Institutional involvement is needed to foster development of the cluster, not only through the creation of an IT Secretariat, but also by acting as a facilitator in creating sustainable conditions, coordinating policies among different levels (national, provincial, municipal), offering information through databases, and conducting new studies. The creation of the proper conditions for development of the cluster involves measures oriented toward:

- Promoting improved competitiveness through incentives;
- Creating programs to develop firms and human resources;
- Emphasizing export programs and promoting clusters abroad;
- Granting equal conditions to local and foreign companies;
- Providing easy access to credit;
- Eliminating distortions and asymmetries in the region;
- Redirecting investment in infrastructure and project development;
- Stimulating foreign investments in specific projects; and
- Playing an active role in fostering integration, common business, and alliances between local and non-local firms.

#### d) Guiding concepts

In an ongoing cluster, it is natural that firms be grouped in a systematic unit. It is easier to create a joint venture or other forms of partnership when the partners know each other, share common behaviours, management's styles and methodologies. While groupings enjoy a certain degree of freedom, firms are obliged to act as partners.

Cluster objectives are to analyze common problems (similar for all group members), develop the cluster by attempting to achieve goals with optimum speed, add new firms to the group, including new IT sectors, evaluate alternatives for meeting needs, and define the courses of action required to realize the cluster's plans. At the same time, there needs to be flexibility, with no single firm dominant, and decisions should be made by consensus, a precondition to preserving the group.

A significant means of attracting new participants and funds is through ongoing dissemination of information concerning the cluster's activities. Given that the experience of others provides input for solving many problems, data collection regarding other clusters was anticipated, with arrangements to make such information available to all members. Members made a commitment to taking advantage of business opportunities through joint projects. When they require assistance or collaboration, the first step is to consider cooperation with other members, as a matter of priority and as a right. The first phase was to establish contacts in locations that are currently the centres for major selling opportunities, along with organizing international road shows and joining various business missions.

Some projects failed in the face of pending deregulation, incentives or other government actions. The cluster has had a very active role (along with public and private authorities) in promoting enhanced conditions for technological innovation and productivity.

#### e) The cluster's vision

- Within the context cited earlier, the emerging vision became clear:
- Linking competence and cooperation as a trigger for innovation;
- Increasing export volumes over the long term throughout all international areas;
- Giving the cluster a major role in the domestic market;
- Choosing a province with the best conditions as the location for new international projects, thus creating a need for the supply of goods and services by new local firms; and
- Promotion of a "brand name" for the products.

#### f) Founders

The initial members of the cluster were:

- DISCAR S.A.



- INVEL S.A.



-	IPP S.A.	
-	INTERWAVE S.A.	
-	LEMPERT & ASOCIADOS S.A.	
-	MKT S.A. (organizer)	
-	PROMINENTE S.A.	
-	SISCARD S.A.	
-	VATES S.A.	
-	VOIP GROUP ARGENTINA S.A.	

#### g) Joint vertical market expertise

Based on individual expertise, it is possible to generate joint vertical market expertise in the following sectors: banking; health care; public utilities; personal services; financial services; telecommunications; government; agro-industrial production; automotive industry; communications media; and wholesale.

#### h) Individual expertise (Discar)

DISCAR S.A. is a development company dealing with telecommunications, and is able to add value in developing and deploying telephony and telecommunications solutions. DISCAR offers equipment to PTT (Telco) companies and public services operators. Principal products are:

- PMC (Public Telephony Toll Ticketing):

Toll Ticketing/Billing System for Public Offices and Telecommunication Centres. In this field, DISCAR is the leader in Argentina, with over 6,000 installed systems, and with exports to other countries, such as Paraguay, Brazil, Uruguay, Bolivia, Chile, Dominican Republic, Venezuela, Spain, Mexico, etc. PMC is the turnkey solution that automates toll calculation and overall administration of a Public Telephony and Internet Office.

- **PMC Ciber:**

Administration software for public Internet offices, such as navigation centres and Internet *cafés*. Handles all the service's administrative requirements, while protecting the navigation computers from having their configuration modified or being attacked by viruses;

- **The “Suquía” tele-supervision system:**

The “Suquía” tele-supervision system operates together with the point of sale equipment (PMC). With “Suquía,” both the Telco and the operator of public telephony networks can gain important benefits, such as: remote software updates, electronic report of the concessionaire's deposits, centralized advertising management, automated distribution of price tables, traffic reports, etc.;

- **Special Designs:**

Through its engineering department, numerous products have been developed for specific applications, such as special design of multimodal communications booths, metering pulse translators and repeaters, multi-line caller-ID receivers, etc

DISCAR has its own hardware and software laboratories, as well as automated machinery for the assembly of boards using surface mount technology (SMT). It subjects all products to rigorous testing by means of automated machinery and tests based on internationally accepted procedures. More than 120 people (including administrative and management personnel) work for this firm. Exports amounted to 30% of total sales in 2003, with 50% anticipated for 2004.

## **i) Individual expertise – Invel**

Invel Latinoamericana's BTB orientation has made it a strategic partner to its customers. It meets their informational needs through the design, development and implementation of software and hardware systems. Its objective is “to add value to its activities, adding precise, timely, integrated and high-quality solutions for business expansion around the world.” Its core business is the development, implementation, marketing and support of integral solutions for retail. The company also develops transactional systems, chip cards software and biometric identification systems. These are organized in the following areas:

- **Point of sale division:**

Invel Latinoamericana has a particular specialization in application systems for point of sale terminals. Solutions developed by the company meet the comprehensive administrative and management needs relating to such devices;

- **Back office division:**

Invel provides the market with tools under a strategic concept of unique operation to deal in a comprehensive fashion with all operations and tasks of modern management;

- **Logistics and distribution:**

Through an alliance with Aldata Solutions, a leader in providing software for industry and retail, Invel offers “Optimized Logistics and Distribution” (G.O.L.D.). G.O.L.D. was specially designed for the logistical needs of large global chains;

- **Scales division:**

Thanks to a strategic alliance with Mettler Toledo and the development of the General Scales Manager (AGB), Invel is the principal distributor of scales for retail in Argentina for

the North American company, and the only supplier providing comprehensive scales solutions;

- Consultation terminal division:

Due to an agreement with Continuum, and the development of the Administration and Verifiers' Monitoring System (AMV), Invel offers advanced technology in Price Check Terminals;

- Loyalty division:

Development of fidelity software, aimed at identifying valuable clients based on frequency and consumption patterns;

- Human resources division:

Payroll is a comprehensive system for human resources management and administration;

- Credit card division:

Invel sells comprehensive applications for credit and debit card administration.

Exports represented 10% of total sales in 2003, with 15% anticipated for 2004. Main foreign markets for Invel are Colombia, Venezuela and Chile, with promising prospects for Mexico and Brazil.

#### **j) Individual expertise – IPP**

Core business is the design and implementation of solutions based on browser, Intranet and Internet technology. Principal products are:

- Scribere – content management:

A tool making it possible to modify a website at any time, regardless of one's location throughout the world.

- Factum digital forms:

Tool for performing monitoring of forms throughout the entire organization. It includes a workflow engine, adaptable to Active Directory or Lightweight Directory Access Protocol security systems, decisions rules management, decision cubes and integration with other systems capabilities.

- Folios Intranet:

A tool to organize and communicate all information within the organization. It is able to manage "tele-working" (working outside the office), remote access and comprehensive monitoring of data.

The firm is oriented to specific vertical markets (law firms, government) and is acting as Application Service Provider in some cases (mostly for Folios). Total employees number close to 70 people. IPP has export projects directed at Spain and the U.S.A., but no recent progress has been reported in this area.

#### **k) Individual expertise – Interwave (IWG)**

IWG was the incubator for several spin-offs, among them, PowerNet ISP, the largest independent ISP in the region, later sold to PsiNet and Voip Group, Inc., a leading U.S. edge VoIP technology provider which later developed the Internet Voice Distribution Systems (IVoDS) project for NASA and the FreeCall for Web.de, Germany. Today, IWG envisions a new

technological and marketing breakthrough in the field of collaboration, involving instant messaging, chat, conferencing, etc.

To address this opportunity, and applying its unique technical skills and development capabilities, IWG plans to spin off a new endeavour called Synergy. Synergy will be an incorporated U.S. company, with headquarters in Miami, Florida, and with development facilities located in Córdoba, Argentina. This combines the maximum market presence and the most efficient resource use. Expertise includes four basic fields:

- Internet technology: extranets, messaging, networks, streaming, VPNs. ISPs, ASPs, Intranets, security, hosting, peer 2 peer.
- Internet content: portals, e-commerce, e-marketing, e-services, tele-services, e-health, e-learning, streaming, e-government, and e-agriculture.
- Communications: advising, consulting, strategy, integration, outsourcing, training.
- Systems and software: project development, design, support, and maintenance.

The company also has products for health care systems, stock brokers and back office applications, and is responsible for operation and maintenance of multi-OS networks. Permanent staff includes 20 people; no information was available concerning short-term contracts. The firm is opening an office in Chile.

#### **I) Individual expertise – Lempert**

The company considers itself a software house, “where IT and Business Rules experts create products to generate competitive advantages, making it a market leader.” Lempert has certified its procedures under ISO 9000: 2000. Principal products (using a combination of upper- and lowercase for names is a distinctive feature of the company) are:

- IOn: integral system for a human resources management model based on capabilities;
- iCEO: extended resource planning (XRP) system, using Oracle Technology, scalable and including modulated components;
- Eliot: developed for the administration, control and monitoring of credit portfolios, improving the detection of probable non-performers and providing effective tools to assist in proactive management of credit risk and reviews.
- KnowIT: e-training tool including results monitoring and processes automation;
- Mercurio: multi-market, multi-branch, multi-currency, multi-product system for stock broker administration;
- E-business suite: integration for the oracle solution;
- Paper out: integral system for performing procedures using only digital forms;
- Abaco: accounting and budgeting system for government;
- iLEX: a solution for the internal management of Parliaments (Provincial Congress).

The staff consists of approximately 70 people, plus an undisclosed number of short-term contract personnel. Lempert has a subsidiary in Chile. Exports represented 25% of total sales in 2002, with 50% anticipated for 2004.

Main foreign markets are Chile and Mexico.

### **m) Individual expertise – Prominente**

Prominente is a member of the Roggio group, with holdings in many sectors of the Argentine economy (means of transport, subways, garbage collection, tollbooth concession for roads and highways). It operates through its branches in Paraguay, Chile, Uruguay, Bolivia and Brazil, being a leader in the key sectors and markets in which it has a presence. Prominente is the product of the merger of Mecq Software S.R.L., a service provider for key companies for more than 12 years, and the IT people of the construction company, Benito Roggio e Hijos S.A., which has provided information technology services to all of the companies comprising the Roggio Group.

According to Prominente's mission statement: "In a world dominated by information technology, it is no longer significant nor sufficient to be strictly an Argentinean company in Córdoba. What matters is to have a global presence, to make a contribution to knowledge, to development, to people's overall welfare, providing technological innovation, applying intelligence to problem-solving within organizations, and being creative when seeking answers and courses of action."

Prominente developed its quality management system based on continual improvement, technological innovation and the integral training of its staff in accordance with DIN EN ISO 9001: 1994 standards. Activities of Prominente include: Design, Analysis, Development, Software Implementation and Maintenance; Analysis and Business Processes Information Technology; Technological Research and Development; Integration of information technology solutions; Outsourcing; Networks and Communications Implementation and Maintenance; Hardware and Software Supply; Technical Support; and Help Desk.

The most important development was the registered PECTRA Technology. This is a complete set of tools that facilitates the discovery, design, implementation, maintenance, optimization and analysis of organizations' business processes. PECTRA Technology enables straightforward interconnectivity between existing and potential future applications, controlling the flow of processes and the quality of products and services, and provides easy-to-use management tools, essential for monitoring processes, while facilitating proactive decision-making. PECTRA Technology provides organizations with the capability to easily link, via the Internet, all suppliers, partners and customers that participate throughout the business processes of the different organizations.

Prominente has a staff of more than 120 specialized professionals working in its offices in Buenos Aires, Córdoba and the U.S.A. Exports currently represent 35% of total sales, compared with 20% one year ago. Main foreign markets are Mexico, Chile, Spain, Venezuela and Colombia.

### **n) Individual expertise – Siscard**

The company's primary activity is administration of a national point of sales network, processing more than 100 million transactions per year and covering credit and debit card authorizations, recording of fidelity and affinity programs and similar processes. Siscard offers several IT Solutions through integration of transactional process operated with band and chip cards. Solutions are multi-host, multi-card, multi-currency, remote and language configurable, using the ISO 8583 protocol for communications.

The company has a reported 65 employees. Siscard has an office in Brazil, and exports projects to other Latin American countries.

### **o) Individual expertise – Vates**

Vates S.A. is a software development company whose primary business areas are the development of software applications and products, and the provision of specialized consulting services, which are offered either in-house or by means of telecommuting. In terms of the formulation, evaluation, and development of IT projects, Vates is a pioneer in the utilization of software engineering processes, in accordance with international standards, such as CMM©, for the development of its applications and products.

**p) Principal products of Vates**

- Kanav platform:

Integrated platform for software production management. The core of Kanav Platform is composed of three interrelated modules: (i) K-Process; (ii) K-Request; and (iii) K-Project. The implementation of such modules, together with an appropriate process, allows organizations to reach maturity levels compatible with international standards, such as CMM©, as proposed by the Software Engineering Institute, Carnegie Mellon University, ISO or SPICE. Furthermore, Kanav Platform allows the implementation of a software measurement plan and continuous improvement of the process, thus enhancing project execution.

- K-Process navigator:

This enables visualization of and reference to the software development processes for companies that have development processes but have not implemented Kanav, thus allowing them to view several development processes, explore the composition of development processes, view workflow and task details, view documentation templates associated with the development process, view procedures, instruction manuals, and checklists, and review corresponding roles and responsibilities within the process.

Vates S.A. currently operates throughout Argentina, with offices in the cities of Córdoba and Buenos Aires. At the international level, it has provided different solutions to various companies, particularly in Latin America. As of 2001, it has had a presence in the Mexican market. It has an estimated staff of 80 people. Exports currently represent 30% of total sales, with an expected increase in the coming years. Main foreign markets are Mexico and Chile.

**q) Individual expertise – VoIP**

VoIP attempts to combine regional advantages:

- Headquarters, corporate and financing in Miami, U.S.A.
- Research, development and support in Córdoba, Argentina.
- Business development offices in Miami, Chile, Brazil and Argentina.
- Strategic Partner in Germany.

VoIP has focused its activities on the following two areas: (i) research, development and operation of solutions using communication on Internet Protocol; and (ii) high-performance systems over Internet. Principal products are:

- VSC (Virtual System Controller):

VSC is a Soft-Switch-Billing fully Integrated Software Solution. By means of standard protocols like Radius, H323, SIP, etc., it manages Gateways (Cisco, Motorola, etc.), IP Phones (e.g., WiFi, Standard) and SoftPhones (e.g., NetMeeting). Platform is accessed and managed by a web interface with several access levels. Allows multi-language interactive voice response (IVR) and multilevel real-time billing. Supports nonstop operation by load balance and fail over.



- EComSpeak:

eComSpeak is an IP Phone Client providing easily tailored and customizable software. Based on the MS Net meeting engine, it runs on any Windows-based platform and is compliant with every market standard.

Staff in Argentina is estimated to consist of approximately 20 people.

### **r) New members – IMPSAT**

This is a telecommunications company operating in Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Venezuela, the U.S. and Peru. Its main products and services include: (i) local and international phone services; (ii) toll-free services; (iii) private voice networks; (iv) access to ISPs; (v) calling cards; (vi) housing and hosting; (vii) managed hosting and security management; (viii) disaster recovery services; (ix) infrastructure; (x) storage utilities; (xi) land and satellite services; (xii) frame relay; (xiii) Lan to Lan; and (xiv) ATM.

The firm has: (i) 9,000 km of optical fibre for Long Distance Services; (ii) more than 1,000 km of optical fibre for Metropolitan services; and (iii) 17 Data-centres. There is a total staff of over 1,400.

### **s) New members – Ayi y Asociados**

Main products and services offered by this member are: (i) visual TIME: Integral Solution for insurance companies; (ii) iCARD: Integral e-business solution for Credit Cards; (iii) iCARE: Integral e-business solution for health-related companies; (iv) iTRIP: Integral e-business solution for travel agencies; (v) iQA: Integral solution for compliance with International Environmental Regulations; (vi) iBRM: e-marketing solution; (vii) Commercial: e-business solution for commercial firms (XRP); (viii) training and consulting services; (ix) Application Service Provider; and (x) research and development and prototype design.

The company has an estimated staff of 25. Main foreign markets for Ayi are Chile, Uruguay and Brazil.

### **t) New members – ThinkSoft Argentina S.A. (formerly Carlos Carballo y Asociados S.R.L.)**

The company's present orientation emphasizes Web applications, open-source and multiple platforms linking software. Main ThinkSoft products and services of include: (i) ThinkSoft Hospitales, an integrated solution for hospitals and other health centres; (ii) ThinkSoft Prepagas y Obras Sociales, an integrated solution for prepaid medical companies, social medicine associations and health care operators; (iii) ThinkSoft Emergencias, a group of dispatch and control systems for medical-emergency companies; (iv) ThinkSoft Farmacias, an integrated system for pharmacies operating as a business network; (iv) Track, a call-centre system tracking requirements, claims and follow-up for various problems; (v) consulting and training; (v) Transaction Web Services; and (vi) LAN, MAN and WAN implementation.

Principal foreign markets for its products are Mexico and Uruguay.

### **u) New members – Deloitte & Touche**

This company is a local member of the multinational organization considered one of the "Big Four." Total staff in Argentina exceeds 1,000. The most recently added members of the cluster are: (i) CBA Solutions; (ii) CompuServe; (iii) Comsys; (iv) Colegio Universitario IES Siglo 21; (v) MECER; (vi) Galander S.A; (vii) Harriague & Asociados; (viii) Horovitz, Kravetz y Asociados; (ix) Institución Cervantes; (x) InterCom; (xi) Iplan; (xii) IR Comunicaciones; (xiii) Kanav; (xiv) Kuantika; (xv) Marck; (xvi) Netizen; (xvii) Price Waterhouse & Coopers; (xviii) Qplus Consultores S.R.L; (xix) Serbal Technologies; (xx) Silica Networks; and (xxi) Techtel.

The Big Four's reasons for joining forces with the cluster are expressed by Mr. Alberto Asensio, a partner at Price Waterhouse:

“Price is a member because the firm serves as consultants for several firms in the cluster, and Price wishes to help the cluster become a world-class supplier. When a business is geared to a universal market, it requires that statistics be prepared using world-class technical support. All the SMEs belonging to the cluster are potentially major players and will need to comply with international standards. Our role is to make that task easier.”

#### **v) Cluster programmes – Cordoba Software Factory**

The proposed goal was to develop software based on international standards, oriented to exportable applications and software engineering, developed by and located within Cordoba SMEs. Common business strategies had to be designed to promote the concept and the products. At present, training programmes for lower-level CMM have been executed. Financial support from the provincial government helped in this initial stage. In order to reach CMM Level 2, the IDB has approved US 120,000 dollars for training purposes. Ten firms are preparing their procedures for this new step. For the second semester of 2004 they are planning jobs requiring 80,000 programming hours. For 2005 they are planning 250,000 hours. At present, the Cordoba Software Factory has a consulting and programming staff of more than 1,500 people – a figure that includes the addition of specialized personnel.

#### **w) Cluster programmes – Unified Development Platform**

The proposed goal involved congruency, through use of a standardized development platform. Each individual firm will have appropriate resources to develop a standardized process (individually or as members of a pool). The present status indicates that the cluster has a unified platform license supporting development of software under CMM rules.

#### **x) Cluster programmes – Cordoba Technology Institute**

The proposed goal was to improve and develop human resources capabilities, a valuable resource in terms of the cluster's future. The Cluster has created the ITC (Cordoba Technology Institute), with technical and financial support from Intel, IBM, Microsoft, and other IT leaders. All of the local universities have been included in the programme, in order to provide updated content, generate R&D activities and promote IT research. The Institute may be considered a virtual entity, acting as a channel to obtain resources and coordinate actions. In the words of the Cluster's Executive Director: “We continue with our efforts to expand the specialized human resources in Cordoba. To expand means to provide them with the appropriate training to meet external business needs. The cluster's activities, designed to meet a growing demand, are oriented to strengthening the specialization efforts, working in collaboration with the universities. This is an ongoing item on the cluster's agenda.”<sup>1</sup>

The lessons learned from the above-mentioned initiatives, along with their advantages and consequences, are considered in Chapter VI, “Conclusion.”

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<sup>1</sup> Basic Cluster information: Hipólito Yrigoyen 146 – 15<sup>th</sup> floor, Córdoba Business Tower, 5000 Córdoba, Argentina. Executive Director: Manuel San Pedro.

## 2. Dupont Apex programme

At the end of 2000, the multinational corporation Dupont announced a programme to link up groups of potential exporters (primarily SMEs) with the company in order to improve supply to other countries. These firms were Dupont's customers, and the idea was to export added value products instead of raw materials. In March 2001 steps were taken to create the following three groups: (i) textile manufacturers; (ii) electrical materials; and (iii) industrial hardware.

Support offered by Dupont to the participating companies included: (i) consulting on operational matters (legal services, customs procedures, banking operations, IT, promotional schemes, brand name registration, etc); (ii) accessibility to use Dupont's supplier services (logistics, banks, customs agents, transportation companies, information networks, etc); (iii) know-how and management capabilities to help in obtaining financial resources (banks, SMEs, the Secretariat, other companies, etc.); and (iv) assistance in developing strategies and preparing business plans (including topics such as branding, marketing, export qualifications, logistics and the international Dupont network). During 2003, new groups were organized to begin a new programme with DUSA, a joint venture of Dupont with the Turkish company Sabanci. At the end of 2003, the status of groups carrying out exports under this umbrella was as follows:

**TABLE 9**  
**NUMBER OF PARTICIPATING FIRMS**

Group Exports	Number of firms
Textiles and clothing (2 groups)	12
Architectural and equipment	5
Painting and coating materials	5
Electrical products	5
Lighting appliances	4
Products for the oil industry	20

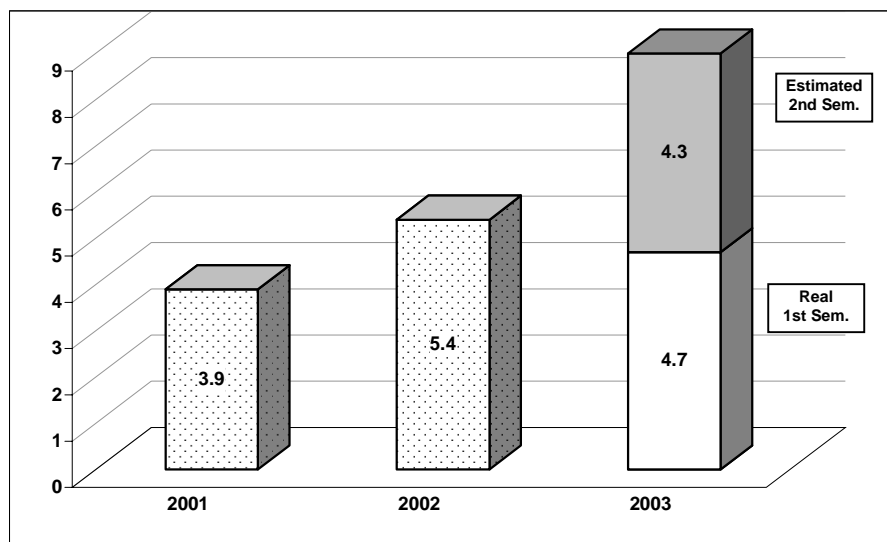
**Source:** <[www.sepyme.gov.ar/index.php?btn=2&a=comex&b=proyecto](http://www.sepyme.gov.ar/index.php?btn=2&a=comex&b=proyecto)>

Changes in exports were significant, as illustrated in the following graph. In the case of certain exporters operating as individual firms, the total exports exceeded US 10 million dollars in 2003.

The main benefits for Dupont have been: (i) added sales as a result of customers' exports; (ii) customers' loyalty; (iii) a secure network of customers to address specialized demand; (iv) smooth-flowing operations as a result of better organization and improved customer response time; (v) same commercial dialect; (vi) proactive leadership; and (vii) new customers gained as a result of the success stories related by old customers.

The main benefits for Dupont's customers, on the other hand, included: (i) ability to access foreign countries as a result of good information sources, capacity to analyse the information, and facilitation of commercial relationships; (ii) better internal organization and use of IT; (iii) new products for the domestic market, as a result of designs geared to meet foreign demand; (iv) new sources for financial resources; (v) compliance with international regulations, improvement in quality, and better prices for products or reduction of costs; and (vi) new dynamics for dealing with exports outside the group. In August 2003 the Exporters' Chamber granted the 2003 Export Prize to Dupont Argentina, based on the development of the Apex programme.

**FIGURE 5**  
**EXPORTS OF DUPONT CUSTOMERS BENEFITING FROM THE PROGRAMME**  
*(Millions of US\$)*



Source: <[www.sepyme.gov.ar/index.php?btn=2&a=comex&b=proyecto](http://www.sepyme.gov.ar/index.php?btn=2&a=comex&b=proyecto)>

Lessons learned from this programme, along with their advantages and consequences, are considered in chapter V, Conclusion.

### 3. Profiling export-oriented industries

A sample of 18 export-oriented industrial firms<sup>2</sup> was selected, and data regarding their IT spending and projects during the first four months of 2004 were collected. (The original idea was to gather data from the first semester, but not all companies were able to provide such information). The companies included represented a wide variety of industrial sectors, thus avoiding the traditional export products, which involve relatively little use of technology.

The range in sales among companies for last year varied from a minimum of US 4 million dollars to a maximum of US 690 million dollars. Average billings for 2003 among the sampled companies was US 77 million dollars. Estimated billings for 2004 are anticipated at US 82 million dollars. Total billings for the 18 companies in 2003 reached US 1.39 billion dollars. Total estimated billings for these companies in 2004 could be as high as US 4.4 billion dollars. The companies have an average staff – administrative combined with service and marketing personnel – of 180. The average number of factory workers is 151. The average total number of employees is 357. The total of IT personnel in the sample is 137, representing an average of approximately 8 persons per company. In terms of types of employment, 62% of the personnel is permanent staff, while third-party staff or part-time contractors account for 38% (85 persons in the first case and 52 in the second). This 38%, representing non-permanent contracted IT personnel, amounts to an average of 3 persons per company, though the distribution is inconsistent, with a greater number of contractors in development areas and only a few in technical-support areas.

<sup>2</sup> The sample contains data on: Anselmo Morvillo; Astra Zeneca; Aventis; Boheringer; Carboclor (Sol Petroleo); Cemento.Avellaneda; Cipet; Corandes; Dow Quimica; Dupont; Envases del Plata; Flora Danica; Merk Quimica; Nike; Ondabel; Sintoplast; Sociedad Com, Del Plata CGC; and VASA Vidrieria Argentina.

## a) IT Spending

The IT spending considered for this case includes infrastructure investment, hardware, software, IT services (consulting, integration, development, training, outsourcing), communications equipment (excluding traditional telephone services) and internal expenses (personnel, operational expenses, supervision). Depreciation is not included.

IT spending during 2003 exceeded US 13 million dollars, and a similar figure is estimated for 2004. The relation of IT spending to sales is a common indicator used for comparative surveys to ascertain the degree of IT insertion in the specific business. For the sample considered, the ratio reached 1.0% in 2003, falling to 0.9% in 2004, representing very poor levels compared to international standards.

However, the relative importance of IT spending may not necessarily be related directly to the volume of sales. Research for the entire market shows the following: There is a ratio of 2.6% for the last segment of SMEs (dividing the SMEs evenly into four segments according to level of sales), while the average ratio for the rest is 1.6%. It is important to point out that this average value exhibits a large variation, pointing to the fact that these companies are operating in different vertical markets. The larger companies have increased billings, though they report relatively stable IT spending, while the companies in the lower segments, based on sales, are increasing their IT investment. One possible explanation may be that improved performance is more visible for the less technologically equipped companies. This is particularly true when their IT usage is below international standards.

Expenditures, divided between internal and external sources, remained virtually unchanged in 2003 and 2004. The actual and estimated expenditures to third parties for 2003 and 2004 are presented (in percentage terms) in the following table:

**TABLE 10**  
**IT SPENDING BY COMPONENTS**  
(Percentages)

Year	Hardware	Software	IT Services	Data Communications	Other
2003	33.1	21.9	22.8	19.4	2.8
2004	35.4	20.9	21.9	18.9	2.8

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

## b) Projects

“Profiling export-oriented industries – Exhibit 1” is intended to show the importance assigned to the projects, based on budget allocation. Internet-related areas (sites, commerce, Intranet), as well as new applications and server consolidation, represent priority concerns.

This could indicate that companies are not adopting a balanced approach, based on the relative importance given to different areas in budget allocation. The most significant example is the Internet/extranet/website case: 61.1% of the companies consider it a strategic matter but only half of these companies are budgeting resources accordingly. Another dominant project area is that of server consolidation, with companies considering this as the top strategic goal and therefore allocating the corresponding resources. This is a typical defensive measure aimed at reducing costs and improving efficiency, but it has no decisive impact on future development.

Among the main reasons for giving high priority to both of these areas is the desire to consolidate and develop new foreign markets.

**TABLE 11**  
**PROFILING EXPORT-ORIENTED INDUSTRIES**  
(Percentages)

	Internet extranet and/or website	VoIP	Mobile computing	Storage	Server consol- idation	Out- sourcing	Security	New applica- tions	Changes in Opera- tional Systems	Regular- isation of licenses
Resources	50.0	16.7	16.7	33.3	55.6	22.2	38.9	44.4	33.3	11.1
Strategy	61.1	11.1	27.8	38.9	66.7	27.8	44.4	50.0	38.9	11.1

Source: Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

### i) Main projects for 2004

Projects viewed as more relevant for 2004 by top management – based on only the first reply to the question) are: integration with SAP; migration from Windows NT to Windows 2000; CRM using Siebel; development for PDA (replacing salespersons' notebooks); price and cost allocation; communications unification; upgrading to Windows 2000 server for a Meta 4 server; regional centralization of IT services (elimination of outsourcing); development of a new portal; addition of modules to ERP for planning and budget, fixed assets and purchases through public bids; updating sales agents' versions of applications; VoIP – messaging integration; ERP consolidation in branches; hardware consolidation; migration to SAP; extension of VPN's coverage; upgrading from SAP R3 version 4.5 to Enterprise; hardware renewal/contract renegotiation

Equipment employed by the companies (percentages of companies having this type of equipment, where one company may have more than one type) were classified as follows: 50% have IBM iSeries (AS400); 16.7% have IBM xSeries (IBM Intel); 11.1% have HP Unix; 7.8% have HP Intel (strong presence in the industrial sector); and 27.8% have Dell servers. Dell penetration is a recent development in the Argentine market, but the company is employing an aggressive campaign based on pricing strategy.

Selected companies use an average of 125 computers per company, of which 66% of the total corresponds to world-class brand names. Of the remaining 33%, 66% are clones and 34% second-class brand names. Average percentage for printers and Palm devices is 29% and 71%, respectively. Approximately 61% of the companies plan to purchase an average of 26 desktops, while 50% of the firms are planning an acquisition of 10 notebooks per firm.

More than two-thirds are not considering installing Linux during the present year, with the most common reasons given for this being: (i) the performance of ongoing systems is reasonable; (ii) not enough advantages to justify a change, and (iii) personnel is not trained for that platform. The remaining companies are already using, evaluating or testing Linux at present. Some 11% of the firms consider Linux a valid alternative for new applications, but most use internal resources where possible.

### ii) Application software

The following table indicates the low presence of CRM, SCM and e-procurement in the sampled companies.

**TABLE 12**  
**PRESENCE OF APPLICATION SOFTWARE**  
*(Percentages)*

	CRM	SCM	B2B	B2C	ERP	Payroll	HR	e-Proc
New application planned	5.6	0	11.1	0	0	0	5.6	0
Functions to be added	5.6	0	11.1	11.1	22.2	5.6	5.6	5.6
Product change planned	5.6	0	0	0	0	0	0	0
Already have a product of this type	22.2	11.1	22.2	0	72.2	77.8	27.8	5.6
Do not have a product of this type	61.1	88.9	55.6	88.9	5.6	16.7	61.1	88.9
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

In relation to the sample, details of suppliers of the installed solutions are as follows:

- Identified suppliers for CRM are:
  - Datasul
  - Developed in-company or for the company by third parties
  - Siebel
  - Team Synergy

It is difficult to identify leaders in this market, since few companies are using this tool.

- Identified suppliers of SCM are:
  - SAP
  - Developed in/for the company

Again, it is not possible to determine whether there is a “leading” company, given that so few companies are using this tool.

- Identified suppliers for B2B are:
  - Corporation/Headquarters
  - IBM
  - Lightech
  - Developed in/for the company (strong presence)

Only multinational companies (see sample) have software related to B2B. No useful information about a trend could be deduced from the sample.

- Identified suppliers for B2C are:
  - Lightech
  - Developed in/for the company

The quantity is too small for this to be considered an open field for the future.

- Identified suppliers for ERP are:
  - BP
  - JDE
  - Oracle
  - In-company
  - SAP (30%)
  - Gaci
  - Meya
  - Organización y Gestión
  - People Soft



The conclusion is that no supplier has a leading role.

- Identified suppliers for Payroll processes:
  - ASM
  - Beijerman
  - Compusystem
  - Consist
  - GV
  - Meta4
  - Nexus
  - Open Solutions
  - Progress
  - Propio
  - SAP
  - Sip 2000

The conclusion is that no supplier has a leading role.

- Identified suppliers for Human Resources:
  - ASM
  - Meta4
  - Open Solutions
  - People Soft
  - Progress
  - In company
  - SAP

Meta 4 has more software deployed in the selected companies but some particularities of this sample could make it less valid in extrapolating to the Argentine universe overall. According to other questionnaires conducted in recent times, it is more representative to consider a majority of in-/for- company developments.

- Identified suppliers for E-procurement:
  - Ariba
  - Corporation/headquarters
  - Oracle
  - Team synergy

No real leadership position in this market can be identified, given that so few companies are using this tool.

### **iii) Internet developments**

Java Platform is preferred (see the sample of companies) over .net technology for Internet developments.

### **iv) Decision-making support**

Some 38.9% use Data Warehouse or Data Mart tools, while 11% are employing Data Mining tools. Some 33.3% have On-Line Analytical Processing (OLAP) tools, and 22.2% have Enterprise Information Systems (EIS). More than 55% of the sampled companies have announced their intention to improve the utilization of EIS.

### **v) Development of applications**

Decisions to be made regarding purchases relate to the selection of international or national packages, or of custom developments. The following tables show the concept or qualities that the companies seem to take into account in evaluating the product to be selected:

**TABLE 13**  
**QUALITY OF THE FINAL PRODUCT**  
(Percentages)

	Local	International
High	33.3	66.7
Medium	55.6	27.8
Low	0	0
No response	11.1	5.6
<b>Total</b>	<b>100</b>	<b>100</b>

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

According to this table, managers give special attention to quality when they are considering international products, while focussing more on a combination of price and quality when they opt for local software.

**TABLE 14**  
**PRE-SALES SUPPORT**  
(Percentages)

	Local	International
High	44.4	50.0
Medium	38.9	33.3
Low	5.6	11.1
No response	11.1	5.6
<b>Total</b>	<b>100</b>	<b>100</b>

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

This situation indicates no clear differences.

**TABLE 15**  
**QUALITY OF DOCUMENTATION**  
(Percentages)

	Local	International
High	5.6	61.1
Medium	55.6	27.8
Low	27.8	5.6
No response	11.1	5.6
<b>Total</b>	<b>100</b>	<b>100</b>

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

According to this table, managers give special attention to quality when they are considering international products, but accept less developed documentation in the case of local products. Most Argentine software houses have had a short business life, making this a high-risk undertaking.

**TABLE 16**  
**INSTALLATION SUPPORT**  
(Percentages)

	Local	International
High	33.3	33.3
Medium	50.0	44.4
Low	5.6	11.1
No response	11.1	11.1
<b>Total</b>	<b>100</b>	<b>100</b>

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

This situation indicates no clear differences.

**TABLE 17**  
**HARDWARE REQUIREMENTS NECESSARY FOR THE APPLICATION**  
(Percentages)

	Local	International
High	16.7	50.0
Medium	55.6	16.7
Low	16.7	27.8
No response	11.1	5.6
<b>Total</b>	<b>100</b>	<b>100</b>

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

These percentages relate more to who is making the decision: a manager in charge of the budget, or an owner who has the final decision.

**TABLE 18**  
**SUPPORT FOR CHANGES**  
(Percentages)

	Local	International
High	38.9	22.2
Medium	38.9	38.9
Low	11.1	33.3
No response	11.1	5.6
<b>Total</b>	<b>100</b>	<b>100</b>

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

The higher figure for the “Low” category in the case of international software may be misleading. Companies acquiring international software normally require training for internal human resources to minimize dependence on suppliers.

**TABLE 19**  
**TRAINING NEEDED**  
(Percentages)

	Local	International
High	11.1	44.4
Medium	66.7	27.8
Low	11.1	16.7
No response	11.1	11.1
<b>Total</b>	<b>100</b>	<b>100</b>

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

This may be considered to be directly related to the “support for changes”: having trained personnel leads to greater independence from suppliers.

**TABLE 20**  
**PRICE/PERFORMANCE RATIO**  
(Percentages)

	Local	International
High	44.4	22.2
Medium	38.9	27.8
Low	5.6	44.4
No response	11.1	5.6
<b>Total</b>	<b>100</b>	<b>100</b>

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

While for some managers a brand name may be more important than the price, (e.g., risk sharing), for the owners managing companies the price factor may be more relevant.

#### vi) Modelling and design tools (AMD)

A very low presence of analysis, modelling and design tools (AMD) was observed during the data collection, and in only a few cases were Oracle Designer and Genexus mentioned as tools being used.

**TABLE 21**  
**INTERNET PRESENCE**

	Website	B2B	B2C	Intranet	Extranet	Tools
Has one	83.3	33.3	11.1	72.2	44.4	77.8
Planned for 2004	11.1	11.1	0	5.6	11.1	0
No response	5.6	55.6	88.9	22.2	44.4	22.2

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

Having a Website is considered a “must,” but resources for updating and improving sites are not a permanent fixture and are more dependent on the actions of competitors.

Existing implementations are primarily related to closing deals, rather than to self-decision. Most SMEs believe that the market is not yet ready for widespread use.

Export-oriented companies consider the Argentine market too small, and logistical problems occur when long distances are involved.

The quality of Intranet is highly variable, and in many cases security issues have yet to be addressed.

Having an Extranet is highly dependant on the industry's sector.

Nearly all employees use e-mail; in the case of Internet usage, on the other hand, more than 60% of users are constrained by various limitations, ranging from non-authorization to the imposition of content filters. Only 38% of the companies provide full Internet access to every workplace.

**TABLE 22**  
**STORAGE**  
(Percentages)

	<b>Backup and Archive</b>	<b>Storage Replication</b>	<b>Resource Administration</b>
Invested in 2003	11.1	5.6	0
Planned for 2004	16.7	16.7	11.1
Increase in budget	11.1	0	0
Decrease in budget	5.6	0	0
Going to eliminate	0	0	0
Not going to invest	44.4	77.8	83.3
No response	11.1	0	5.6
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

Though many people are conscious of the needs, short-term considerations prevail.

For top-of-mind requirements, results were as follows: 22% of the companies regarded IBM as the first alternative for storage solutions, with HP and Telex storage scoring 11%. Other alternatives named were CA, Dell, EMC, Legato, Hitachi and Next App.

#### **vii) Security solutions**

The table shown on the following page highlights the poor situation with regard to security solutions. However, this may be seen as relating to the quantity of non-authorized copies and license violations, which were detected in many surveys.

When a company accepts software piracy, it is not taking account of security as a key factor. Investments in this software category are limited to multinational or globalised Argentine companies.

**TABLE 23**  
**SECURITY SOLUTIONS: INVESTMENTS**  
(Percentages)

Investment in solutions	Authorization Authentication Administration	Encryption	Secure Content Management	VPN	Intrusion detection and vulnerabilities evaluation
Unchanged	16.7	5.6	5.6	0	0
Invested during 2003	0	0	5.6	11.1	5.6
Did not invest during:					
- 2003 nor 2004	66.7	77.8	83.3	27.8	55.6
- 2003 but plan to do so in 2004	5.6	11.1	5.6	16.7	22.2
Amount					
- Increased	11.1	5.6	0	33.3	16.7
- Decreased	0	0	0	11.1	0
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
Identified suppliers	Cisco Global	Global	Symantec Comsat Millicom	Equan Cisco	Global

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

**TABLE 24**  
**RESOURCES ALLOCATED FOR IT SERVICES**  
(Percentages)

	Own	Third pty.
More	33.3	33.3
Less	0	0
Unchanged	66.7	61.1
No response	0.0	5.6
<b>Total</b>	<b>100</b>	<b>100</b>

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

Allocated resources are closely related to economic change in the companies. When this survey was conducted, doubts about the continuity of Argentina's economic recovery were a common topic of conversation, and influenced investment decisions or intentions.

**TABLE 25**  
**MOTIVATION FOR IT INVESTMENT**  
(Percentages)

Motivation	%
Domestic markets' old requirements	27
Domestic markets' new requirements	35
Requirements of previous external markets	38
Requirements of new international markets	33
Cost reductions	28
New product lines	16
Other	13

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

Requirements of external markets were a driving force for new IT investments.

### viii) External services

Many articles explain the advantages of outsourcing, but the statistics show that the movement toward this modality is slow. Tables 26 and 27 give the sense of a market, but one whose development remains far in the future.

**TABLE 26**  
**EXTERNAL SERVICES: PLANNED INVESTMENTS**  
(Percentages)

Investment 2004	Consulting for plans, reviews, processes, strategies	Systems integration and additions to existing software	Work hours for analysis and programming	Applications development	Software maintenance services	PCs and networking outsourcing	Processing outsourcing	Business processes outsourcing
Greater	11.1	5.6	22.2	27.8	22.2	11.1	0	0
Smaller	5.6	5.6	5.6	0	0	0	5.6	0
Unchanged	5.6	33.3	33.3	16.7	50.0	44.4	5.6	0
No:								
- investment in 2003	55.6	38.9	22.2	27.8	16.7	27.8	61.1	55.6
- plans to invest	22.2	16.7	11.1	27.8	5.6	16.7	27.8	44.4
- reply	0	0	0	0	0	0	0	0
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

**TABLE 27**  
**PERCEPTION OF SUPPLIERS – TOP-OF-MIND**

Processing outsourcing (mentions)			Systems integration (mentions)			Security (mentions)			Business processes outsourcing (mentions)		
1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
50% IBM	17% EDS	Cube Corp	22% IBM	11% IBM	IBM	11% IBM	11% Cisco Systems	Isek	Accenture	Price	
11% EDS	Comsat	HP	11% EDS	Accenture		Cisco Systems	IBM	Microsoft	Deloitte		
Cube Corp	Cube Corp	Impsat	Accenture	HP		EDS	Modulo				
Telecom	DATA Express		ASSA	SAP		HP	Reycom				
Unisys	IBMN Netizen Siemens		HP Sufter			Impsat Price Ran Sigma Symantec	Symantec				

**Source:** Prepared for this report by Trends Consulting using IDC worldwide definitions and methodology.

## 4. Belgrano Department (Province of Santa Fe)

The territorial and sectoral agglomeration of companies, known as the Belgrano Department or the Rafaela case, is an example of competitiveness, profitability and sustainable export capability. When this movement began, no one spoke of clusters or poles; rather, this was regarded as a confluence of interests driven by public and private actors.

The Belgrano department (40,000 inhabitants) hosts 30% of the nation's production of seeders, pulverizers, harvesters and tractors. In many small towns in this region, unemployment is nonexistent. The industries located in the city of Rafaela, with an average of ten employees each, exported an equivalent of US 108 million dollars in 2003. The price per exported ton was US 2,148 dollars, compared to the national average of US 274 dollars per ton.

In the 1994-2000 period (during which local currency was overvalued), the cluster's industrial SMEs exhibited performance superior to those operating as isolated firms. During that period, though the general employment rate for the industry fell 20%, the activity of the "clusterised" companies remained largely unchanged.

The trend of locating small factories close to complementary—and competitive—colleagues (involving the same productive chain) made it possible to counterbalance the pressure of open markets, financial constraints and globalisation. According to World Bank terminology, Rafaela is a case study in LED (local economic development). MERCOSUR played no significant role in this success. Many firms are quality certified, and some are exporting to the European Community.

The World Bank points to the following as being vital to success: (i) an institution for policy and planning, such as the Municipal LED Training and Research Institute (ICEDEL); (ii) economic institutions that play a major role, such as the Small Enterprise Business Association (CAPIR), the Technology & Innovation Centre and the Enterprise Development Centre; (iii) a range of LED Programme Initiatives, such as locality development (infrastructure and physical planning); (iv) enterprise development (incubators, enterprise support services; innovation); (v) horizontal cooperation between municipality, local business associations, and new small-enterprise association and NGOs; and (vi) learning processes: Standardized Knowledge Transfers (Training), Organizational Learning in Local Public Agencies, and a strategic plan for the city.

### a) Notable actions on the part of the Municipality

This municipality has been instrumental in introducing modern administrative tools and working in tandem with the private sector. Actions by the municipality included: (i) development of a strategic plan and corresponding goals; (ii) economic programming, including business missions, participation at international congresses and partnerships with other cities; (iii) the In-Factory Learning Programme: a combination of theoretical knowledge and work in factories, organized by the Institute for Local Development; and (iv) investment support: information combined with some form of coaching.

### b) Japan International Cooperation Agency (JICA) Senior Volunteers Programme

Pursuant to an agreement with JICA, two Japanese international trade experts have been working, since April 2003, on the Programme for the Internationalisation of Local Companies. Its project goals are to provide in-company training, and technical support in marketing and international trade to SMEs that are presently involved in exporting or are potential exporters,



with an emphasis on fostering and expanding the internationalisation of Rafaela's industrial milk processing and metal/mechanical SMEs.

This programme has enabled the city and the industries to gain information concerning markets unknown to them, and to establish business contacts with world-class Japanese companies. The Rafaela Municipality committed to continue promoting export development within the industrial sector, and during 2004 an International Trade Programme, under the direction of Motosuke Takayama, has been in progress.

The Japanese experts have visited 33 Rafaela firms relating to the following sectors: metal/mechanical, car parts, food, furniture and packaging. In 15 cases, market penetration studies and preliminary sales efforts were performed, using Japan as the reference market. In addition, introductory training and contact facilitation with Japanese companies were carried out for companies without previous export expertise, such as Marengo (candy) and EMC (furniture).

### **c) Cooperation Agreement with the Technological University of Obregon**

A number of students from the Technological University of Obregon, located in southern Sonora (Mexico), were interested in conducting a research project on marketing, using as a case study a small town selling products to the European Community. An agreement was signed with the University, and three Mexican students are currently analysing this unusual marketing case. Two of the city's companies (Polidab and HB), members of Rafaela's International Trade Chamber of Commerce, agreed to work with the students as part of a scholarship programme. The students began their work in June 2004.

### **d) Other agreements**

Recognizing the need for exchange and for widening the horizon of local inhabitants, two other academic agreements were signed, one with the State of Baden-Wuerttemberg (Germany) and the other with the city of Fossano (Italy).

### **e) Prizes**

Companies located in Rafaela have won several prestigious prizes in recent times. Bio-cheese produced by Sucesores de Alfredo Williner S.A. won the "Dr. Arroyo" prize (sectoral chamber in Spain). This company also received the ArgenINTA prize for agro-alimentary quality.

## **C. Problems faced by SMEs in participating in the trade-oriented value chain**

### **1. Problems that SMEs encounter in participating in IT networks**

Many companies, compelled to consider their survival as members of the economic sector, delay mid-term decisions or do not regard them as a "must." During the period in which Argentina had a fixed, one-to-one exchange rate with the US dollar, most SMEs laboured under severe restrictions due to the lack of competitiveness, and IT investment was not considered a priority.

Following that period, the ongoing instability and constant rules changes made for a bleak scenario. When the situation began to revert to greater stability, with a more predictable future, winners and losers emerged. SMEs geared to exporting or to selling products to large exporting companies were the undisputable winners (with sales at dollar values, and a greater portion of costs in devalued pesos). These companies have invested in IT over the last two years,

and have acquired equipment and general-purpose software, along with updated ERPs. The next challenge will be to increase participation in IT networks, as part of a second phase. As observed in Case No. 3 (profiling of export-oriented industries), of this study, only 11.1% have made plans to invest in B2B initiatives in 2004, while response to the question on projected investment in B2C was null. (Notably, only 11% of the surveyed companies had some form of B2C activities).

Education is another key issue. Learning about the opportunities networks may offer individual companies are essential to improving IT development: the unknown may provoke rejection.

An important distinguishing factor among companies is the age of their owners. Enterprises of young owners are more conscious of the role of networking and invest more in this area. They have more information about the power of IT as a tool and utilize it as a key to success.

Another exception to consider is initiatives of large companies such as Techint (Tenaris group), which have forced their suppliers to be electronically connected with the main company, progressively increasing the level of integration with them.

## **2. Barriers that inhibit SMEs from participating effectively in supply chains and trade networks**

The most important barrier that inhibits SMEs from participating effectively in large supply chains is a lack of confidence in the ability to act simultaneously as partner and competitor with other companies. Experiences have not always been favourable with respect to this type of cooperation: in some cases only one (or only a minority) has obtained favourable results from collective actions to which all members contributed.

It should also be pointed out that the role of government was not conducive to achieving such goals, with, over many years, twice-yearly changes in policy, new promotion plans, changes in tax rules, effects from non-collectible tax credits from exports and other problems.

From a technical standpoint, many SMEs are ill equipped to deal with the demands of working collaboratively with other companies. Moreover, in many cases owners are sceptical that cooperative actions will optimise their use of resources and that efforts to develop a coordinated plan will provide cost savings and be successful.

In the last two years, the Government and the Bank of Boston Foundation increased the number of companies acting under a common umbrella. However, in this case, an overvaluation of the US dollar with respect to the Argentine peso acted as an additional factor in neutralizing somewhat the negative views on such an undertaking. Individual efforts are more expensive, and many people began to think that salaries in pesos, combined with sales in dollars, were a good combination for exporting their products—an opportunity that could be lost if experience and expertise in IT issues were lacking.

### **III. Government policies designed for SMEs, IT, and international trade**

#### **A. IT policies in the country's overall strategy**

Decree 252/2000 created the National Programme for the Information Society. The objective was to generate policies and projects in order to use IT to provide broader access to information, knowledge and trade. The State Secretariat for Science, Technology and Productive Innovation was designed to take responsibility for formulation, supervision and coordination. The Secretariat has taken on this goal as part of the Science, Technology and Productive Innovation National Plan.

Another Decree (243/2001) has given the State Secretariat of Communications responsibility for activities related to design and implementation of public policies for widespread use of the Internet and other digital networks, and for development of e-commerce to foster investment in ICTs and the related human resources. The present governmental structure does not include this Secretariat, having instead a National Office of IT (ONTI), which is responsible for overseeing such issues, but with no specific mandate related to the Information Society. At present, this entity is responsible for issuing digital certificates (digital signature), coordinating networks to deal with government emergencies, updating the technological standards for government (most recently issued in the spring of 2003), coordinating IT forums, promoting and coordinating the development of scorecards and indicators panels for the thousands of national offices (four are in a relatively advanced state of development), and overseeing the e-government portal (which at present serves only as a link to other sites). Plans for the future to include a National E-Government Plan, infrastructure development for bringing digital signatures into widespread use, access to FIRST (international forum), and development of interoperability standards and of a guide to make it easier for citizens to connect with the government.

In August 2004, the “Law for the Promotion of the Software Industry” was approved, aimed at improving the development of Research and Development activities related to programming innovations and certification under international rules. The industry is awaiting the Regulatory Decree, which will make the law operational, and is hoping that the corresponding benefits will begin to be seen in 2005. This plan is oriented to creating improved conditions at 600 firms and 1,300 micro-enterprises, employing 25,000 people, and increasing IT career

possibilities for more than 100,000 students. Some of the principal benefits are the possibility of converting 70% of the social charges to tax credits, and establishing an income deduction of approximately 60% for such companies.

The law creates the Fiduciary Fund for Promotion of the Software Industry (Fonsoft) for the purpose of financing software research and development projects, providing for specialized human resources, improving the development process and increasing access to financial aid by new enterprises.

The Science, Technology and Productive Innovation Secretariat (SECyT) will be responsible for organizing and managing the Fiduciary Fund, while the SME Under-secretariat will serve as the enforcement authority for the other measures, including the obligation to publish on an Internet website the Registry of Beneficiaries for this regime.

Due to the ongoing changes, efforts to accomplish this second goal appear to be sporadic. For example, a plan to finance 1 million PCs for individuals was halted because of the general economic crisis, with only 40,000 financed under the subsidized National Bank loans.

Another plan was “one citizen, one e-mail.” Its main objective was to provide no-cost e-mail for all the citizens, but no evidence of an ongoing project was found. A project to provide legal protection for e-mails—a proposal that was distributed to various associations and chambers of commerce during 2002 for comment—is still pending. Another aborted project was a plan involving Argentine businesspersons and the philanthropist Martín Varsavsky, who is associated with the National Administration. Its aim was to connect 40,000 schools in Argentina to an educational Internet portal (Educ.ar). The portal contains numerous educational resources, but it remains unclear whether it will continue in operation.

IT-related policies are included within the Science, Technology and Productive Innovation National Plan Project, 2004, under the direction of the State Secretariat for this area. The general objectives of the Project are:

- Sustainable socioeconomic development of the country;
- Worldwide expansion of a competitive and productive sector;
- Improved quality of life and solutions to the population’s needs;
- Taking advantage of the opportunities arising from the Knowledge Society, as well as generating new opportunities;
- Construction of a sound, conducive, encouraging and protective State; and
- Substantial reduction of regional differences and inequities in income distribution.

Among the specific objectives, one is directly related to IT, namely, that of creating links between: the educational system at all levels, the Science, Technology and Innovation (CTI) system, the society at large, and the State.

In terms of strategies, it is difficult to differentiate which are specific to IT, since most include components involving computer science and communications. Some, however, that may have particular impact on CTI are:

- Accelerating, every year, the national and provincial effort on science, technology and innovation, in both the public and private sectors, with the objective of reaching a total investment in R&D of 1% of GDP by the year 2006.
- Forming a true Science, Technology and Productive Innovation Secretariat (or SNCTIP), based on the coordinated planning and action of public and private institutions, in an attempt to join efforts and based on associativity (association for specific purposes) in joint programmes, thereby avoiding unnecessary repetition and overlap.

- Articulating scientific and technological research activities with the demands, needs and opportunities of the productive and social sectors, while at the same time taking into account and embracing an environment conducive to free academic research, which is necessary as a source of basic knowledge for the overall development of the country.
- Generating appropriate conditions for ongoing learning and training of our human resources; promoting the establishment of a fourth-level university system; strengthening the foreign scholarship system to allow students to attend high-quality institutions worldwide in cases where the necessary resources in particular subject areas is not available in the country.
- Carrying out publicity to significantly increase private-sector participation in science and technology investment.
- Strengthening the capacity of the provinces, with emphasis on the most disadvantaged ones, to identify the true social and productive needs and to assist in defining scientific and technological projects that fall within the various existing financing lines and that have a likelihood of success.
- Linking the CTI system with the education and university systems, in order to coordinate efforts and promote the ongoing training and education of a creative, critical, scientific, and innovative spirit at all stages of the human learning process.
- Encouraging the creation and development of research and innovation networks.
- Promoting the innovative and competitive spirit of domestic companies, primarily SMEs, assisting them in incorporating a business orientation and the need to move toward use of patents, as well as increasing scientific education and awareness within the society regarding the need to have a good SNCTIP.
- Strengthening the capacity to work successfully in the areas of technological innovation and publicity, in an attempt to meet economic needs.
- Building capacities for providing assistance and advice in science and technology
- institutions, in an effort to promote patenting and protection of intellectual property.

Although it is difficult to differentiate between them, there are several specific programmes directly related to IT, including the following:

i) Argentine Integrated Scientific and Technological System (SICTIAR)

Its objective is to administer the unique registry of researchers in the country, allowing for the standardization of individual curricula, registration of projects, institutions and research groups, and the processing of such information in developing national Science and Technology (S&T) indicators, as well as the use of these data in administrative issues related to this sector, such as calls for bids and evaluation of the projects. The goal is to have accurate, updated information available, thus allowing for the improvement of planning and evaluation activities. The budget is \$2,487,500 (approximately US 800,000 dollars).

ii) **Actions taken by SECyT to establish the National Science, Technology and Innovation System**

The strengthening actions taken by the Science and Technology Institutions led to the need for establishing mechanisms to allow the science and technology sector to formulate the plan and budget, reinvest strategically its own resources generated by its activities, and efficiently

administer staff regulations and wage scales, based on the particular activities involved. There is no specific budget allocated for this programme.

**iii) Consolidation of the computing resources supporting scientific and technological research**

This programme has three components:

**(a) “Science and Technology Electronic Library” Site**

The site provides Internet access to complete documents and articles from national and international science and technology publications covering various areas of knowledge, as well as to reference databases, document summaries and other bibliographic information related to science and technology. Currently, 3,600 publications by Elsevier, databases related to agriculture, biology, psychology, mathematics and food sciences, WHWILSON (Human Science), IEEE (Engineering), and other free sources are available. Other planned services, not yet contracted, include a database called Science Web service, and three databases of publications from different disciplines.

At present, this service is being used by the Science and Technology Research Council (CONICET), Agrarian Technology National Institute (INTA), National Industrial Technology Institute (INTI), National Atomic Energy Board (CNEA), and by all of the national universities. It is designed to allow access to the site by public hospitals and private universities, among other institutions. The total budget for 2004 is \$11.4 million (approximately US 3,800,000 dollars).

**(b) Mainframe Clementina II**

This aims to broaden the use of the mainframe “Clementina II,” not only by the scientific sector, but also by academics and by the business sector. To this end, it charges user fees to support the costs of equipment maintenance and eventual replacement. The mainframe Clementina II is a resource specifically suited to research involving highly complex and exacting processes, particularly ones that require the use of a high-performance tool capable of running parallel processing.

Clementina II is a Gray Origin 2000, with 40 R12000 300MHZ – 4MB cache processors, 10 GB memory, 360 GB hard disk, and a DAT 12 GB tape drive. At the Secretariat is a Display Room, which has 4 OCTANE display stations providing multimedia solutions that operate in specific areas. The budget for the year 2004 is \$380,000 (approximately US 127,000 dollars), which will be partially covered by the access fee.

**(c) Technological-Scientific-Academic Videoconferencing Network**

This is the product of an inter-institutional project between the National Technology University (UTN) and the (SECyT). The National Education Videoconference Network is operating at the UTN, and in order to improve the service provided by this system, a multipoint conference unit will be incorporated and the necessary equipment for simultaneous operation in different parts of the country will be acquired (by the UTN and the SECyT). The budget for the year is \$168,000 (approximately US 56,000 dollars).

**iv) Special support services for innovative SMEs**

This category of support includes: (i) identification and analysis of “technology opportunities”, i.e., inventions capable of generating a concrete application in the production of goods and services; (ii) administrative and legal assistance and advice on intellectual property rights protection; (iii) economic research studies to examine the possibility of exploiting the particular invention, financing of market studies and of foreign patenting, based on real possibilities of trading in the markets in which products are patented; (iv) promotion of alliances

with institutions specialized in accessing risk capital; (v) promoting the incorporation of university research teams in this system; (vi) creation of a regulatory framework to allow researchers to spin off products when there is no possibility of licensing them to third parties. This provides an incentive for researchers to carry out research that has commercial potential. The budget for 2004 is \$1.3 million (approximately US 434,000 dollars).

Beyond the scope of Science and Technology, we have found, in the area of education, substantive elements that would reduce the digital divide through more intensive ICT use.

The education programme within the scope of the IDB loan 1345/OC-AR was approved some time ago, and has recently been reformulated in the wake of Argentina's economic crisis. The second objective of the programme emphasizes: "Improvement in quality, which is promoted by: (i) strengthening articulation within the basic, general-education level and in secondary schools and Polimodal (final years of high school in a 9-3 plan) schools; (ii) institutional and curricular restructuring and appropriate and intensive use of information and communication technologies (ICTs) at secondary schools; updating of teaching methodologies in the schools, and formulation of an educational curriculum that better addresses the needs and interests of young people and encourages the development of an active citizenry." The reformulation includes an explanation of the fact that various components, among them ICTs, are not being allocated the appropriate amount, based on:

- the need to maintain a balance among the different financing necessities for each sector (training, equipment, building, etc.); and
- the overall integrity of the Programme, in terms of the linkage of activities designed to accomplish a series of objectives.

As regards the operation of this project, the topic of ICTs was incorporated in the sub-programme titled: "Improvement of the Quality and Equity of Education," consisting of three components: (1) Reformulation and adjustment of offerings in the Secondary School Educational System; (2) Integration of ICTs in the educational system; and (3) Strengthening the management of the educational system. Sub-programme I has a total budget of US 420.6 million dollars targeted to 1,500 secondary schools. Upon the signing of the Membership Agreement, the provinces will agree to support the national policy by opening up opportunities that promote the entry of at least 25% of the institutions that become part of the programme.

Although it is the second component that deals specifically with ICTs, other components also contribute to this. This makes separate evaluation and analysis highly impractical. For example, in building improvements, furniture acquisition and facilities for computing science are planned.

The specific ICT component involves US 96.6 million dollars and is designed to: (i) strengthen the capacities of school teams in implementing new technologies; (ii) enhance information and communication procedures in schools; (iii) develop strategies for integrating ICTs in different areas and curricular projects; (iv) enhance the use of ICTs as a medium for teacher training, for exchange of experiences, and as an information source to enrich the teaching plan; and (v) encourage the integration of ICTs in basic general education schools. To fulfil the above-mentioned objectives, the following are planned: (i) training on the pedagogic and practical use of ICTs; (ii) training on telematic and multimedia supports; and (iii) providing teaching and other materials for the training courses, including setting up a databank of experiences.

More specifically, it will provide computing equipment for the 1,500 secondary schools and 2,500 basic general education schools that are part of sub-programme I, and for the basic general education schools to be part of sub-programme II. The total amount allocated for this purpose is US 52.3 dollars million. This will allow the installation and pedagogic use of new

computing resources and the installation of networks (Intranet) that will be installed in the course of the school construction process (part of a separate component). The Programme does not foresee financing Internet connection, but it does envisage communication via other means, such as software or exchange materials in CD-ROM or print formats. The cost of the connection framework was estimated at US 26.6 million dollars.

The programme includes a Component 3 to strengthen the management of the educational system, at a cost of US 6.9 million dollars. This amount is intended to finance costs of equipment and technical assistance to improve the information system and provide for the installation of software related to “control boards,” along with development of a Computerised Regulation Digest (DI) that will make it possible to access information on current regulations. The cost of equipment installation, training and technical staff in the municipalities will be financed by the provinces. National technical assistance will be provided for the installation of computing tools and administrative technologies to achieve an overall reorganization of the process.

## **B. Policies to support SMEs**

There are at present numerous measures to encourage SMEs to participate in international trade. For those that become involved in the process, the two most common problems are: poor publicity (given the nature of the target population, publicizing the event in the papers is not sufficient), and the fact that SME managers tend not to bring to their projects a sufficient degree of formality to make them amenable to professional analysis.

There are various tools to support SMEs, ranging from facilities to direct subsidies.

### **1. Export promotion**

#### **a) Export groups programme**

This programme (SME Under-secretariat) is designed to guide and encourage the development of sectoral partnerships, for the purpose of achieving more efficient internationalisation of SMEs by providing technical assistance in designing and implementing export strategies. A Partnership Strategy should make it possible to: (i) complement the export supply of companies that experience problems of scale; (ii) improve the capacity of companies to negotiate with customers or suppliers; (iii) facilitate collective learning, while sharing the high costs of gaining entry to other markets; and (iv) develop activities that small companies would be unable to carry out individually. The goal is to reduce the major limitations faced by SMEs, by making it possible to design a joint strategy that can be executed collectively, directing the products to similar trading sectors.

This programme was implemented in September 2000 and presently includes 30 export groups comprising some 250 companies from different sectors: food, auto parts, construction, specialty items, household goods, hardware, forest products, iron work, lighting, clothing, agricultural machinery, leather, metal/mechanical products, furniture, furs, paints and lining materials.

During 2002 the collective exports of companies involved in the programme grew 58% compared with the previous year, in a period during which there was a 5% decline at the national level. Furthermore, participating companies that were new to the export business experienced an increase of 20%, while at the same time diversifying their markets.



## **b) Support for new exporters**

Through the “Support for New Exporters” programme, the SME Under-secretariat provides advice to SMEs located throughout the country on launching export operations. This includes analysing and diagnosing problems, training, and tutorials for designing and implementing a strategic export plan. The programme’s objectives are to: (i) encourage an export culture in the SME business sector, based on continuity and quality, and on principles of cost and quantity; (ii) contribute to the necessary adjustments in production to make projects affordable to the parties involved; and (iii) help support the companies until their export activities get underway.

The system uses assistants, provided through agreements with the national universities, who are responsible for guiding the export process of participating SMEs. The assistants receive training on: (i) export costs and prices; (ii) development of a business plan; (iii) formulation and evaluation of the export plan; (iv) techniques and tools useful in obtaining information on the Internet; and (v) establishing a schedule for meetings with the programme tutors. Companies are required to pay the transportation costs of the assistant, assign him/her a work place and Internet-connected computer at the company’s facilities, and attend periodic evaluation meetings at the official institution.

The working schedule consists of: (i) defining the company’s export offerings; (ii) providing an economic/financial evaluation for the company; (iii) identifying prospective markets; (iv) determining a working schedule for problem solving; (v) defining target markets; (vi) creating a timetable for carrying out publicity; (vii) setting up of a permanent information system on markets and relevant commercial opportunities for the company; (viii) identifying and establishing staff who will serve as contact points between the company and public and private institutions that may be important to the company’s export activities; and (ix) developing a website, along with institutional pamphlets in at least two languages.

## **c) Foreign trade area information system**

The Foreign Trade section of the SME and Regional Development Under-secretariat provides companies with databases maintained by different national and international institutions, as well as information available on different websites. The objective is to assist the SME business sector in obtaining commercial information for purposes of subsequent decision-making. The office provides information on: (i) lists of prospective importers; (ii) statistical data; (iii) import regulations in the target countries; (iv) import duties and protective tariffs; (v) trade fairs and exhibitions abroad; and (vi) general information on the target country.

## **d) Articulation between large companies and SMEs**

In recent years, there has been recognition of the importance of linking producers of different sizes through cooperative efforts and joint activities to enhance awareness of improvements in competitiveness and the effects thereof. Interaction with large companies can generate synergies that benefit SMEs, especially by the time they start business, through enhancing the export culture and expanding companies’ business abroad.

At the end of 2000, the SSEPyME called upon the large industrial companies operating within the country to undertake collective, coordinated efforts aimed at incorporating, reincorporating or strengthening exports vis-à-vis a group of SMEs with export capacity and potential.

Each participating SME must: (i) be a direct or indirect customer of the large company; (ii) demonstrate the capacity and/or desire to be an exporter, and the willingness to adopt financing measures needed in order to improve business penetration abroad; and (iii) demonstrate the intention to participate in a joint work schedule and to interact with the large company and with the SSEPyME on export-related topics.

The SSEPyME takes part in the following activities: (i) selecting the SMEs that will participate, and carrying out necessary technical or feasibility evaluations; (ii) facilitating access to available support tools within the SSEPyME and other national-government offices (which have their own technology equipment and methodology for creating and operating joint projects); and (iii) supervising activities during the course of the project.

The role of the large company is: (i) to facilitate access to the company's logistical, legal, tax, and other services; (ii) transfer management know-how and, at its discretion, grant advantageous prices for export-related supplies; (iii) facilitate SMEs' access to financing for operations related to the foreign market; and (iv) facilitate access by trade-related SMEs to the tax credit programme.

## 2. Trade facilitation

A "single-window system for exports" has been announced on several occasions, but has never been implemented. The last such occasion was in 2002, when the Strategic Plan for Production was published.

The Chamber of Exporters was one of the main supporters of a single-window system, but at present they are satisfied with the improvements made to the Customs system (known as "Maria"), which significantly reduces export time. Moreover, The Chamber of Exporters believes that customs procedures for imports are not onerous.

The automatic processing resulting from the implementation of the Maria system has reduced corruption, and the Chamber is concerned that changes to the present system may result in a re-emergence of some of the earlier practices.

### a) Assistance programme to establish productive collaboration associations

This programme is designed to supplement the operating expenses of Productive Collaboration Associations, which may be set up with a minimum of 4 members, with the characteristics of SMEs, provided they document 3 years of experience in their area of operation. They are to receive a 50% subsidy for the first two years, with a maximum of \$60,000 (approximately US 21,000 dollars) per year, through quarterly checking accounts. Possible objectives are: (i) incorporating technology; (ii) increasing foreign trade; (iii) exploiting tourism resources; (iv) improving conditions for commercial purchases; (v) implementing quality-control systems; (vi) fostering production specialization; (vii) enhancing competitiveness; and (viii) providing production support.

Permissible expenses include: (i) establishment of the firm's offices; (ii) wages and social benefits to be paid for staff contracted on a dependant-relationship basis that may be ongoing, in order to meet the firm's needs; (iii) salaries of technical staff contracted for tasks related to the firm's objectives; (iv) expenses for communications and services; (v) trips for commercial purposes; (vi) publicity materials; (vii) maintenance of the building and of equipment located at the firm's headquarters; and (viii) construction of minor infrastructure.

As of the writing of this report, the programme is not yet in operation.

## **b) Legal assistance**

The State Secretariat has implemented a programme of Legal Assistance for SMEs. It is designed to answer inquiries regarding the relationship between the SME and the national government in areas related to the firm's operations, promote compliance with current legislation, and collaborate in addressing administrative issues in a timely manner. It provides analysis of legislation in connection with solving problems facing SMEs, relying on past experience and on changes at the national and international levels.

## **3. FDI promotion**

The Investment Promotion Agency (ADI) is a working unit within the Secretariat of Industry, Commerce and Small & Medium Enterprises, which is part of Argentina's Ministry of Economy and Production.

ADI works in two areas. The first of these is institutional promotion: identification of business opportunities in different sectors and regions of the country, and dissemination of relevant information. The second relates to investor support: specifically, a reference centre, specializing in supplying up-dated information on economic, financial, legal, educational, technical, tax-related, and other issues connected with making decisions on investing in Argentina.

ADI provides information on issues such as: (i) the legal framework and investment incentives; (ii) business opportunities and sectoral information; (iii) economic overviews of Argentina's provinces; (iv) updated legal information on investment and international trade; and (v) costs of principal items.

The Agency is also able to assist potential investors by providing specific information adapted to their particular needs—primarily on issues related to establishing an operation in Argentina. It maintains a network of contacts with other national departments, and encourages investors to make direct contact with areas about which they require further information.

ADI works jointly with certain other national and provincial governmental agencies in promoting sectoral investments, while coordinating its external relations through the Ministry of Foreign Affairs, International Trade and Worship, as well as through the commercial offices of foreign embassies within the country.

## **4. Business promotion**

### **a) FONAPyME (national development fund for micro, small and medium enterprise)**

The Secretariat for Regional Development of Medium and Small Enterprise called for bids totalling \$80,000,000 (approximately US 27 million dollars) for existing or potential projects to be carried out by SMEs or by any other firm. This is intended to obtain financing for carrying out investments that create or broaden the productive capacity of the company and/or bring in new products, services or processes that significantly improve the development, expansion and growth of such companies, and that take into account the potential impact on regional development and job creation.

This consists of three calls for bids for SME projects, encompassing the following main characteristics:

- i) General call: involves all economic sectors, for \$60 million (approximately US 21 million dollars) of financing, for potential projects with three bimestrial closing dates (03-31-2004, 05-31-2004 and 07-30-2004) with \$20 million dedicated to each. If the amount resulting from the addition of all the approved hand-ins to the bid in the three due dates does not reach \$60 million, there will be a fourth due date for the unused balance, to have a closing date of 10-29-2004. The call for bids includes both investment projects and reorganization of working capital.
- ii) Call for bids targeting the tourism sector, for \$10 million (approximately US 3.5 million dollars), divided into two bimestrial closing dates for \$5 million each, with closing dates of: 03-31-2004 and 05-31-2004. Financing assistance must be applied to the construction, expansion, repair or completion of hotels, lodges or other establishment designed for tourist accommodations, adaptation of such establishments for the disabled, or for equipment, new vehicles or any other domestically manufactured device—designed, in all cases, to provide tourist services, housing, supply of non-polluting energy and other measures dedicated to small-scale tourism, as well as any other non-traditional activity such as: tourist sports activities and the establishment and recycling of ski lift equipment. Financing terms are as follows:
  - for new companies, loans of up to \$20,000 (approximately US 7,000 dollars), with a maximum term of 54 months, with a grace period of up to 18 months.
  - for new or existing companies, loans greater than \$20,000, up to the maximum allowed amounts, with a maximum term of 48 months, which may include a grace period of up to 12 months.
- iii) Call for bids targeted to the aquiculture sector, for \$10 million (approximately US 3.5 million dollars), divided into two bimestrial closing dates, for \$5 million each, with submission deadlines of: 03-31-2004 and 05-31-2004. Financing assistance must be applied toward the production of fish eggs and fingerlings, breeding and fattening of all water species in sea, natural water sources, or pools specially built for such purpose, and for the handling and processing of products obtained in the previous stages.

**b) National Fund for the creation and consolidation of micro business (FoMicro)**

This fund is designed to create productive units of goods and/or services on the part of unemployed and under-employed workers' groups, and to consolidate existing companies that deal with micro business. The Argentine National Bank (BNA) coordinates this programme in collaboration with the SME Under-secretariat, which is part of the Ministry of Economy and Production.

The purpose of this initiative is to finance individual or joint projects. Along with low rates and individually signed loans, FoMicro will provide, through a network of social organizations, tools to assist beneficiaries with training, consulting and guidance to ensure optimal development on the part of the beneficiary firms.

The programme's objectives are to: (i) encourage, consolidate and create companies dealing with micro business; (ii) generate new jobs; (iii) incorporate an important sector in the formal economy; (iv) promote unemployed workers' associations; (v) support the strengthening of social organizations; and (vi) encourage local production and regional economic development.

Operation of the project will be overseen by social and popular organizations, which will carry out the following tasks: (i) publicity; (ii) support for project design; (iii) approval of the

project; and (iv) training, technical assistance and guidance. The participating social and popular organizations will receive a percentage of the loans granted, in order to cover expenses arising from the above-mentioned activities.

The beneficiaries may be: (i) projects from new individual or joint micro businesses established as production units for goods and/or services; or (ii) existing individual or joint micro businesses. Financing conditions will be as follows: (i) maximum amount: \$30,000 (approximately US 10,400 dollars); (ii) minimum amount: \$3,000; (iii) annual interest rate: 7%; (iv) term: 48 months, with a grace period of 6 months; and (v) guarantee: personal signature.

### **c) Bonus-rate loans**

The SME Under-secretariat implemented a system to provide SMEs access to low-rate loans. When it was originally created, a bonus of three percentage points was envisaged. Through Resolution 7/2003, this was increased to eight percentage points.

There will be an initial stage, with a total of 100 million pesos (approximately US 34 million dollars), with 500 million pesos (approximately US 172 million dollars) allocated to the system. As of February 29, 2004, 53 million pesos in loans had been granted to companies within the sector.

Loans are granted through 14 private financing institutions, which bid to participate in the interest Bonus-Rate Regime. The SME Under-secretariat will issue a call for new bids, expanding coverage to include all financing institutions. This will take place in as many phases as appropriate or necessary, increasing loan capacity consistent with the interest rates that participating financial institutions offer to firms applying for loans. The average bonus rate is currently 9.6%, with a base of 6% and a ceiling of 10.75%.

Loans that are part of the expanded Bonus-Rate Regime must be used for:

- the acquisition of new national-origin capital goods, for a maximum of 80% of the purchase price, excluding VAT, not to exceed \$800,000 (approximately US 270,000 dollars), for a maximum term of 60 months, with up to 6 months grace period;
- the establishment of working capital, up to an amount of \$300,000 (approximately US 100,000 dollars), not to exceed 25% of the annual sales, for a maximum term of 36 months;
- the prefinancing of exports: this may be used to grant revolving limits of 600,000 pesos, for terms of up to 3 years;
- the financing of exports: for a maximum amount of 80% of the commercial operation, not to exceed 1.2 million pesos, for a maximum term of 48 months;
- the establishment of new business for a maximum of 30% of the investment, excluding VAT, not to exceed 100,000 pesos, for a maximum term of 48 months, with a grace period of up to 6 months for capital and interest when justified by the project; and
- the regulation of tax and social security-system debts, not to exceed 20% of the agreed amount, on the part of any of the above-mentioned beneficiaries.

### **d) Global programme for credits to SMEs (MyPEs II)**

This is a trustee's programme consisting of US 100 million dollars supplied by the IDB, and US 100 million dollars supported by the National Government. The original SME programme was suspended due to the economic events of 2001.

The MyPEs II may be accessed by any natural or juridical persons from the private sector sited in the country and involved in primary or industrial production activities, trade and provision of services, with the exception of financial entities, provided that they meet the requirements for target activities specified in the financing provisions. Included are prefinancing and financing of exports, working capital, and investment financing (fixed assets).

To be selected, SMEs must have annual sales not exceeding US 3.5 million dollars, excluding VAT. This figure will be calculated based on the average annual sales of the company over the last three years, based on certified documentation or equivalent legal accounting information.

There will be a maximum loan amount of US 1 million dollars to any given company. Loans will be granted in U.S. dollars. Programme resources will be provided to companies whose activities contribute to reducing exchange risk.

The maximum term of payment for working capital and for prefinancing and financing will be 12 months. For investment financing the maximum term will be 7 years, with possible authorization of a grace period of up to 3 years, provided that the financing objective is justified and is consistent with the criteria of the Bank and of the trustee administrator.

As of February 29, 2004 the interest rate had not been determined.

#### **e) Italian credit in support of SMEs**

Micro-enterprises and SMEs—including cooperatives—legally established and domiciled in the Argentine Republic and with at least 3 years of trading experience may apply. Italian-Argentine firms will have to be established by parent companies that have operated for at least 3 years in Italy and Argentina. The minority partner, whether Italian or Argentine, must have at least a 15% share in the firm.

Credit applications to a single company, even when they are divided into more than one contract, must have a minimum value of \$ 25,000 (approximately US 31,000 dollars) and may not exceed \$ 2.5 million (approximately US 3,125,000 dollars), while the total applied for may not exceed 60% of the annual billings. Loans will be granted for the acquisition of goods, raw materials, intermediate supplies, technology transfers, training, technical and commercial assistance, industrial licenses and patents.

To gain approval, projects must be economically feasible, and must be associated with Argentine or Argentine-Italian SMEs or micro-enterprises. In addition, it must be demonstrated that the projects will create new jobs. The following criteria will be given priority: (i) percentage increase in employment; (ii) location of the productive activity in areas of the country with high rates of unemployment or internal migration; (iii) increase in added value through the use of local raw materials; (iv) high number of women and young people in the firms involved; (v) introduction of compatible environmental technologies.

Loans will have a repayment term up to 10 years, with a grace period of up to 3 years, and a maximum estimated annual interest rate of 5.2%. In the second call for bids, which closed on November 3, 2003, 370 credit applications were submitted, for a total of \$774,000,000 (approximately US 267 million dollars). The total amount of investment for which companies applied was estimated at \$1,500,000,000 (approximately US 517 million dollars). This credit line, granted by the Italian government, is being provided using global funds in the amount of approximately \$ 75 million (approximately US 94 million dollars).

## f) Mutual guarantee associations programme

In the Argentine legislation on Mutual Guarantee Associations (*Sociedades de Garantías Recíprocas*, or SGRs), these are referred to as commercial associations whose purpose is to ease SMEs' access to credit by granting guarantees to assist in meeting their obligations. This is part of the joint strategy involving large companies and SMEs and is also incorporated in official policy.

These associations provide an as-yet little used tool for SMEs and micro-enterprises to guarantee any financial commitments they may undertake, and addresses the problem SMEs encounter in conducting trade with larger-scale companies.

Problems frequently faced by SMEs, in relation to finance, include: (i) weak internal organization among SMEs, making it difficult, in contracts, for them to establish credibility as regards quantity, quality, permanence, security and hygiene; (ii) lack of information about the region or sector of which they are a part; (iii) evaluation based on net worth rather than on the feasibility of the project involved; (iv) limitations in financing working capital; (v) lack of long-term financing for companies of this scale; and (vi) difficulties in meeting the requirements of mortgage guarantees capable of covering large loans.

Against this background, the State has attempted to facilitate SMEs' access to financing. The aim of the Mutual Guarantee Associations is to grant liquid guarantees to their mutual partners (SMEs) to improve conditions for access to credit (viz., credibility in meeting commitments).

This may be achieved by issuing financing guarantees (loans), technical guarantees (fulfilment of contracts) or trade guarantees (for advance payment of suppliers or customers) and any legally permitted guarantee provided by the signing of Mutual Guarantee Contracts. These may provide their partners with technical, economic and financial advice directly or via a third party contracted for the purpose. The SGRs are set up by mutual partners and protecting partners.

**Mutual partners:** These are proprietors of SMEs, being natural or juridical persons, with at least 50% of board votes, i.e., with decision-making power within the firm.

**Protecting partners:** These may be foreign or national, public or private natural or juridical persons that contribute funds to the firm's capital and to the SGRs risk fund, holding no more than 50% of the firm's capital.

Provincial or municipal governments may be protecting partners in an SGR if permitted by their own legal regulations. The risk fund is designed to support the guarantees granted by the SGR.

To avoid favouritism toward a mutual partner (SME), the law has provided that the SGR shall be prohibited from allocating to such partner guarantees amounting to greater than 5% of the risk fund.

No mutual partner may have more than a 5% share of the firm's capital. SGRs may not assign commitments, with a given creditor, for amounts greater than 25% of the risk fund, and this must be in a manner that takes account of the commercial and financing needs of the SMEs, in relation to at least 4 different types of creditors, in order to prevent SMEs from coming under the control of a single creditor.

**i) Special benefits for SGRs**

- Fees collected by granting guarantee contracts are exempt from VAT and income taxes.
- They may reinsure risks assumed in the FONAPyME (National Development Fund for Micro, Small and Medium Enterprise). In this Fund, the trustor is the Ministry of Economy and the trustee is the Argentine National Bank; the subscription commitment is \$100 million (approximately US 34 million dollars).
- Guarantees granted by an SGR that are registered in the Central Bank are regarded by the Bank as having the highest degree of trustworthiness.
- Creation of a business development centre.

**ii) Benefits for the protecting partners are as follows**

- Tax exemptions: capital and risk fund contributions are wholly deductible from the taxable income in determining the income tax liability for relevant activities, in the fiscal year in which they are made.
- In order for tax deductions on contributions to the risk fund to become final, the contributions must remain in the firm for at least two years, and the SGR must maintain reserve stock in its portfolio for an amount equivalent to 80% of the risk fund.
- Opportunity to invest: assets comprising the risk fund may be invested and generate earnings on behalf of the holders (protecting partners).
- Customer and supplier development: SGRs are a tool not only to transfer the risk exposure to the SMEs' customers, but also to orient suppliers toward accommodating the growth policies of large companies.

**iii) Benefits for the participating partners are as follows**

- Tax exemption: capital contributions made by the participating partners may be wholly deducted from the taxable income in determining the income tax liability for relevant activities, in the fiscal year in which they begin.
- Improved negotiating capacity in dealing with the financial system and with large clients or suppliers.
- Reduced requirements for guarantees, with evaluation based on the knowledge of the company and on the particular project.
- Reduced financing costs and/or longer terms for investment projects.
- Technical assistance in formulating projects and establishing credit files.

The benefits for the State are: (i) clear allocation of resources; (ii) increase in the number and variety of economic agents; and (iii) benefits through the generation of real profits to support government actions.

**g) Hands-on workshops**

Some of these are currently being conducted, while others have been scheduled for future dates.

- “Export Samples” workshop to resolve problems that SMEs face in carrying out export activities.
- Workshops on procedures for collecting refunds and obtaining CBUs (uniform tax numbers).



- Workshop on completing and analysing export documents.
- Workshop on completing and analysing certificates of origin.

#### **h) Business restructuring (strategic and operational change) support programme (PRE)**

In today's complex economic environment, subsidies provide an opportunity to assist Argentine SMEs establish a firm footing.

The PRE grants SMEs subsidies of up to 50% for technical assistance projects that include services such as foreign and domestic market studies, development of new products and services, productive infrastructure engineering, commercial plans, quality control certification, etc., capable of strengthening their competitiveness in areas such as: export projects, import substitution and integration in the value chain of customers and suppliers, promoting business partnerships, highlighting their competitiveness and increasing their market presence.

The programme's procedures are designed to ensure clarity in tasks and in the issuance and implementation of plans and projects to help the PRE provide skilled staff for ongoing, personalized assistance.

This Programme has a Directory of Consultants (DIRCON), which provides a registry of all professionals participating as technical service suppliers to the PRE. This offers information on consulting services for SMEs and micro-enterprises requiring professionals to develop their restructuring projects. The programme is presently being reformulated.

#### **i) Agency network**

The Production Development Agencies Network is a resource designed to help achieve regional and sectoral integration of SMEs and micro-enterprises. This Network is coordinated by the SME Regional Development Area and by the Under-secretariat for Regional Development, and is designed to promote and develop support policies for domestic firms and contribute to their growth and consolidation within the country.

The operation of the Network is based on principles of institutional collaboration and cooperation, partnership between public and private sectors, and co-financing involving the central government and provincial and municipal governments.

The Production Development Agencies Network is the primary instrument for carrying out the mandate of the SME Under-secretariat, serving as an institutional platform for local perspectives, while facilitating the implementation of strategic complementarities at the national, provincial and local levels. The Network's operation is supported by high-quality assistance and services provided by Development Agencies throughout the nation.

The agencies are not-for-profit institutions whose objective is to establish relationships with SMEs and micro-enterprises, and to enhance local and/or regional economic development, through publicity and promotion of public-sector instruments and the direct provision of services to local SMEs and micro-enterprises. Such services are designed to address needs, identified at the local level, in improving the national competitiveness of these companies.

The importance of decentralization can be clearly seen in efforts by local actors within the sector, who are in the best position to understand the specific problems in each municipality, province or region, to integrate these institutions.

## C. Special measures to rectify the “digital divide” between firms

### 1. Human resources

#### a) Tax credits for training

This regime provides financial support to micro, small and medium enterprises that invest in training their new human resources. The SME Under-secretariat refunds the cost of such training through the issuance of an endorsable Government Credit Certificate, with no expiration date, which can be used to defray national taxes, such as VAT and income taxes, under the AFIP (Federal Public Revenue Administration). Any natural or juridical persons may take advantage of this regime, provided that they have no tax or fiscal liability imposed by the AFIP, for any reason, as of the date on which the project is submitted.

The budget for the Tax Credit Programme is allocated annually in accordance with the provisions of the National Budget. The maximum amount that companies may access is determined by a percentage of the wages paid during the last 12 months. This percentage is set at 8% for SMEs and 0.8% for large companies.

Projects fall into four modalities:

- Modality A: involves the granting of tax credits to one or more large companies or SMEs working to develop partnership initiatives.
- Modality B: involves projects designed to strengthen and improve the value chain.
- Modality C: is designed to create capacities for establishing new firms.
- Modality D: involves projects to improve competitiveness through a specific training component.

Training may be overseen by any natural or juridical person (university, educational institution, consulting company, professional association, chamber of commerce or trade union, etc.) with extensive experience in providing certified training within enterprises.

These firms may conduct courses on their own, or through contracted third parties; in the latter case, the contracting firms will be responsible for quality and for meeting the relevant objectives. This excludes companies that are not part of an economic group or that have a legal connection with the company representing them.

#### b) Federal Programme for Training and Technical Assistance 2004

The structure for this programme, organized by the SME Under-secretariat, is open ended, depending on the requirements of the SME. The programme will organize courses and seminars based on the demand. The proposed subject matter must relate to legal and administrative aspects of formalizing companies, improving partnerships, restructuring firms in order to modernize them, promoting entrepreneurship, and developing new products and services. All activities will relate to methodology and IT.

### 2. Technical aspects

An Assistance Programme, designed to help establish Productive Collaboration Associations, is provided for under N° 2, Trade Facilitation Policies, and is intended to support SMEs in bridging the digital divide that separates small and large companies.

### 3. Financial aspects

Most loans, as specified under N° 4, Business Promotion Policies to Support SMEs, are for enhancing the IT capabilities of SMEs, with financing rates below those normally obtainable by SMEs.

- FONTAR

Fontar (the Argentine Technology Fund) receives funds from several sources (primarily multilateral organizations) and finances public and private projects designed to promote innovation and technological modernization.

This programme is to be carried out through ongoing systems and periodic calls for bids. The most recent annual calls for bids involving non-reimbursable funds (2003) amounted to approximately US 100 million dollars, with a limit of US 100,000 dollars per company, designed to encourage technological innovation. More than 300 projects were accepted beyond the first stage, but as of 9 months past the closing date, technical and financial evaluations have not been completed. This programme includes approximately US 2.7 million dollars for business incubators and for development of technology poles. Last year the total amount was not reached, due to a lack of projects.

### 4. Info-centres

The main info-centre is the “Gobiernoelectronico.ar” (e-government website), with hundreds of links relating to different topics. This will be described in the next chapter. There is no official website to provide specific information on rectifying the digital divide between firms.

The Electronic Library of Science and Technology (Biblioteca Electrónica de Ciencia y Tecnología, [www.biblioteca.secyt.gov.ar](http://www.biblioteca.secyt.gov.ar)), provides access to articles from more than 3,000 specialized journals worldwide, but access is restricted to educators and researchers from public organizations.

## D. E-government targeting SMEs and trade promotion

### 1. Overall strategy/structure of e-government

There is an official website dealing with e-government, cited above ([www.gobiernoelectronico.ar](http://www.gobiernoelectronico.ar)), which is designed to provide information on numerous topics related to the daily informational needs of citizens. It offers links on many different topics: government offices (national, provincial and municipal), libraries, museums, universities, Argentine newspapers, legislative information, public utilities, social policy, etc

The official website, “Crystal” ([www.crystal.gov.ar](http://www.crystal.gov.ar)), is intended to comply with Article 8 of the Fiscal Responsibility Law, providing information concerning the management of public resources. It includes the following chapters (most of which are available only in Spanish): (i) Budget Execution (detailed version, from 1999 to the most recent month reported); (ii) Procurement (see next subtitle); (iii) Civil Service (information about human resources, salaries, legal framework, etc.); (iv) Retirement Pensions (due to the uncertain status of reforms, this website is not available at present); (v) Public Debt (due to the country’s financial default, this website is presently unavailable); (vi) the Nation’s Financial Statements (most recent balance published is for 2000); (vii) Tax Compliance (still in preparation); (viii) Public Service Regulatory Agencies (information concerning these, along with links to the various agency websites); (ix) Social Spending (still in preparation); and (x) Worldwide Transparency (link).

## 2. Applications

### a) E-procurement

This is part of the above-mentioned Crystal website. It contains information about purchases made by numerous offices, the legal framework, and where to obtain information concerning public bids. No electronic procurement is available for government as a whole. Certain decentralized offices engage in electronic purchases, but these are atypical.

### b) Customs and other trade-related procedures

Customs uses the “Sistema María” (Mary System), providing a comprehensive solution to many of the procedures required for customs clearance. This is essentially the same as other systems with similar “feminine” names, used in other Latin American countries.

Information is available to citizens. One can obtain information on approximately 90% of the total imports and exports involving use of the uniform customs document. Available information includes country of origin, country from which goods were shipped, clearance date, transport information, regional customs office responsible for the clearance, condition of the goods, etc.

### c) E-finance, and/or e-payment

Private e-finance is well developed in Argentina or, more precisely, in Buenos Aires and certain large cities. Its use in government is limited, and applies mostly to products and services provided by the private sector. People may send tax forms to banks to request payment via an electronic charge to their accounts, or they can use automatic tellers to pay taxes: the payment is made to the private financial institution, which in turn reports the payment to the government offices using electronic or paper media). In some cases, people may request that the public office send the forms to their bank or credit card company, which then carries out the electronic payment on the due date. Normally, however, such companies do not have online connections with the government office, and must report using specially formatted paper, tape or disk.

Recently the AFIP (Federal Tax and Customs Administration) introduced electronic payments, though only in certain limited cases, given the complexity of the Argentine tax system.

### d) Other

MECON (the website for the Ministry of Economy, [www.mecon.gov.ar](http://www.mecon.gov.ar)) is one of the most widely used sites in Argentina. It provides information on numerous public activities, legal frameworks, news, and public agencies, and includes many links to public and private sites.

The AFIP (referred to above) provides, through the websites, software for preparing the many different forms required for filings. Information concerning regulations, indexing tables, taxpayers’ tax liabilities, and Excel files to calculate interest and charges, are all available through the website.

The Central Bank’s website provides information on financial statistics, financial regulations, status of financial debtors (more than five millions people and companies are classified according to their credit ratings), closed accounts (resulting from checks issued with inadequate funds) and other useful information.

INDEC (the National Institute of Statistics and Census) offers a wide variety of analytic information on major national statistics.

## E. Institutional issues

### 1. Standardization, such as EDI and cryptographic codes, and public infrastructure

The United States, as the primary force behind the Wassenaar Arrangement, and its predecessor COCOM, maintain export controls on cryptographic hardware and software products. The Wassenaar Arrangement is an agreement between thirty-three countries worldwide covering export controls for conventional arms and dual-use goods and technologies.

The participating states of the Wassenaar Arrangement are: Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Slovak Republic, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom and United States. The Wassenaar Arrangement was established to foster regional and international security and stability, by promoting transparency and greater responsibility in transfers of conventional arms and dual-use goods and technologies, thus preventing destabilizing accumulations. Participating states seek, through their national policies, to ensure that transfers of these items do not contribute to the development or enhancement of military capabilities, which undermine these goals, and that they are not diverted to support such capabilities. The decision to transfer or deny transfer of any item will be the sole responsibility of each participating state. All measures undertaken with respect to the arrangement will be in accordance with national legislation and policies and will be implemented on the basis of national discretion.

Argentine Law 25,506 established the “Digital Signature Infrastructure.” The law was published in December 2001 and is federal in scope.

The legal regulation established the following structure:

- Enforcement Authority:

Chief of Cabinet of Ministers (*Jefatura de Gabinete de Ministros*), which is in charge of the implementation of the regulations, including detailed resolutions and technical procedures necessary for enforcement.

- Consulting Board for the DSI (Digital Signature Infrastructure):

Special commission acting under supervision of the Chief of Cabinet of Ministers. It is responsible for suggesting technical procedures for implementation.

- Digital Signature Administrative Office (*Ente Administrador de Firma Digital*):

This is the office that administers the digital signature and is authorized to grant licenses to certifiers and to supervise their activities.

- Licensed certifiers:

These are the natural or juridical persons authorized to issue certificates, and they must be registered. Public entities may act as certifiers if they meet the relevant requirements.

- Registry authorities:

The entities responsible for validating identities and for other data on which issuers of certificates rely.

- Audit System:

This must be established in order to evaluate the quality and reliability of the systems used by the licensed certifiers.

The Under-secretariat of Public Management offers a no-cost Certifying Authority that provides individual digital certificates. With this certificate, a user can secure all electronic e-mail communications, guaranteeing the authenticity of the author and the integrity of the message.

To optimise the dissemination of the digital signature technology, a Digital Signature Laboratory was established. Private agents and government employees have the opportunity to experiment with keys, the issuing of certificates, and transmission of e-mails using digital signatures. The Lab offers various information concerning this technology.

Decree 2628/2002 established the detailed regulations, along with an extensive terminology, including definitions or rules for numerous topics, such as electronic signatures, digital signatures, digital documents, digital certificates, licensed certifiers, certification policy, statement of certification practice, security plan, end-of-activity procedure (for licensed certifiers), contingency plan, certificate revocation list, date and time certification, reliable third parties, suppliers of digital certification services, endorsement of devices for the creation and verification of digital signatures, certification of systems using digital signature, digital certificate holders, etc.

Other regulations related to digital signature are:

- Resolution JGM N° 176/2002

Provides for the opening of an office at the Under-secretariat of Public Management for the receipt, issuance and filing of digitally signed documentation.

- Resolution SGP N° 17/2002

Establishes the procedure for requesting the necessary certification for certain qualified government service employees, through digitally signed documentation.

- Decree N° 677/2001

Digitally signed documents transmitted via digital networks to the Securities and Exchange Commission, fulfilling the relevant requirements and having the same validity and force as paper documents.

- Law N° 25,237

The *Sindicatura General de la Nación* shall act as the auditor of the digital signature system used for internal procedures of the National Public Sector.

## 2. Intellectual property rights

The trademark legislation (Law 22,362) provides for the protection of trademarks that have been duly registered with the National Industrial Property Board. Registration requires the payment of a fee.

Trademarks may consist of one or more words, drawings, emblems, monograms, engravings, stamps, seals, pictures, bands, combinations of colours in a given place on products or packaging, wrappers, boxes, combinations of letters and numbers, letters and numbers drawn in a special way, publicity slogans, embossed marks that are distinctive and any other signs for distinguishing products or services.

Protection is granted for a maximum of ten years each time a trademark is registered, but registration may be renewed indefinitely provided the trademark has been used in the last five years.

Argentina has adopted the international classification of goods and services used by the World Intellectual Property Organization. Patents protecting industrial property rights are granted by the Patent Office for 5, 10 or 15 years depending on the Patent Office's judgment of the appropriate period, upon application by the owner and subject to payment of a fee. No renewals are granted.

Foreign patents may be renewed for a maximum of 10 years, but the term for which their Argentine registration is granted may not exceed the life of the original foreign patent. Patents are transferable by deed and subject to registration by the Patent Office. Patents expire if they are not used within two years of their registration, if their use is interrupted for a similar period or upon the expiration of the term for which they are granted.

In 1967 Argentina became a party to the Paris convention, covering industrial property, and its subsequent amendments, including the 1958 Lisbon Agreement and the 1967 Stockholm Agreement. Control of patent and trademark issuance is the responsibility of the National Industrial Property Board.

Copyrights are granted by the National Register of Intellectual Property upon application and subject to payment of a fee; they protect the authors' rights during their lifetime, and those of their heirs for another fifty years. Anonymous works belonging to organizations and juridical persons are protected for thirty years.

Argentina is a signatory to the Berne Convention (and its subsequent amendments, including the 1971 Paris Agreement), the Inter-American Convention held in Washington in 1946, and the Geneva Convention of 1952 concerning copyrights.

The Congress is currently studying a bill on computer software copyright, not yet specifically dealt with under Argentine law. Law 25,036 modified the general legislation, including an article titled "55 bis" (inserted between articles 55 and 56), considering software material to fall within contracts establishing licenses for use or reproduction, but maintaining unchanged the typology of recognized intellectual rights. As a consequence, they occupy a grey area, subject to judgment based on different interpretational arguments. The result has been that more than 80% of software, commercial or private, is pirated. Most people believe software is free.

In Argentina, critical voices are often heard arguing against software copyright. For example, the Free Way Organization (Organización Vía Libre) declared:

"The way proprietary software is brought to market has deep and perverse consequences regarding the chances of growth for less developed countries. Current patent and copyright law in most countries, developed or not, allows authors to license the right of use of commercial software under very restrictive terms, which in effect prevent users and potential competitors from accessing the source code of the software they are using. These limitations produce various degrees of damage all over the world (witness the Microsoft antitrust trial), but for poor countries the consequences are devastating, as proprietary software effectively acts as an insurmountable barrier to entry into the market, which gives them little chance of accessing the benefits of the IT revolution. The virtual monopoly that big corporations have established in the market has created very difficult conditions for poor countries to overcome the costs and serious setbacks that are inherent to proprietary software, and from developing any serious software industry beyond the export of labour. The simplest solution for this problem is the widespread adoption of free software."

This paragraph was excerpted from <http://www.vialibre.org.ar>.





## IV. Regional Networks

At the local level, and as outlined so far, no significant developments have been detected in relation to electronic networks or virtual portals that facilitate or promote the electronic exchange of goods, products and services in the Argentine SME sector. New initiatives that exist relate to institutional and informational developments; these are not related to technical or specific business areas.

Nevertheless, in both private and public arenas, local and regional projects and initiatives are beginning to emerge, and this appears to be leading in the direction of the electronic exchange network model that exists in other parts of the world.

### A. The Latin American and Caribbean Economic Association (LACEA)

The Latin American and Caribbean Economic Association (LACEA) is the regional network partner of Global Development for the Latin American and Caribbean region. LACEA is an international association of economists with common research interests in Latin America. Its objectives include facilitating the exchange of ideas among economists and policymakers, encouraging research and teaching related to the economies of Latin American and Caribbean countries and fostering dialogue among researchers and practitioners carrying out work on this region.

According to its website - <http://www.lacea.org/index.htm> -

“LACEA is generously supported by grants from the Global Development Network and the World Bank's Development Grant Facility. In addition, the annual meetings are supported by grants from The World Bank, The Inter-American Development Bank, the Ford Foundation, and the William and Flora Hewlett Foundation. Click here to read more about LACEA's supporters.”

“.....”

“LACEA sponsors four networks in the field of Capacity Building. Each Network -- Inequality and Poverty, Political Economy, Regional Integration, Finance Camps -- holds annual meetings in different regions of Latin America.”

## B. Survey of SSR networks

Excerpted from “Survey of SSR Regional and Sub-Regional Networks” Working Draft GFN, Paper 28, last updated in October 2003:

“Survey of SSR Networks in Latin America and the Caribbean”

### Context

“... Although the number of organizations and networks appears quite high, there is very little coordination among them. Each network specializes in a particular sector or programme area of SSR, creating an organizational vacuum for a more holistic approach to security in the region. Several patterns emerge from the mapping study, the most important being that SSR in Latin America and the Caribbean warrants its own definition, which differs markedly from the definition used by practitioners and academics dealing with security issues in other regions of the world.”

“Having successfully transitioned to democratically elected states most countries in Latin America may have different perceptions of security than do countries of other regions. Insecurity is usually described in the context of fragile economic systems and unstable political structures evident in the frequency with which elections take place. Corruption at all levels appears to be a widespread problem, as do lack of transparency and rule of law in the judicial system. Most organizations and networks thus target the people on the ground in an attempt to educate them, grant them access to information and give them the voice necessary to enact changes through existing institutions. The overarching SSR themes in Latin America and the Caribbean are human rights (especially the violation of human rights by the court and legal systems), democracy, civil society participation and judicial reform.”

“The most active networks, which address the themes discussed above, are non-governmental networks in Brazil such as CONECTAS, SurNet, and ABONG. Most of them are integrated into larger networks with branches in the US. Donors and partners are typically concentrated in North America with the US and Canada being significant contributors, perhaps due to the growing trading relations and commitments (NAFTA, FTAA) between the regions. The outputs of most of the networks include research and publications. Cooperation and exchange of ideas are encouraged through conferences and workshops. Most networks offer project support to member NGOs on an ad-hoc basis. There is also a concerted movement towards media access and dissemination of information to the public. Networks such as The Association for Progressive Communication (APC) support NGOs working in the areas of human rights and social justice by offering the technology and training to enable dialogue and easy sharing and dissemination of knowledge.”

## C. Fraunhofer Institut für Software und System Technik

Within the field of software development, four European partners (in Sweden, Norway, Germany and Spain) and five partners in South America (in Chile, Argentina, Uruguay and Columbia) have established regional networks of SMEs in their countries. The intention is to establish cross-regional cooperation agreements between existing networks or standalone enterprises in South America and Europe.

Primary contribution from Fraunhofer ISST to the project is the development of a skills database, as part of the website. This contribution is based on Fraunhofer ISST's platform BaSeWeP and focuses on skills structures. It also provides an editor for submitting skills descriptions, as well as a matchmaking tool. Information is available at: <http://www.isst.fhg.de/english/projekte/2003/sme.html>.



## V. Conclusion

The foundations for SMEs to develop and establish a presence in the global market seem assured in the current environment, provided that the various efforts undertaken separately produce collective results.

A resurgence of IT spending, covering all aspects of technology, could serve as the great enabler in accelerating the globalisation process, particularly in view of Argentina's in-country software development and the fact that software is present in many aspects and phases of exportable products.

However, prospects are not entirely rosy. Based on past experience, what is needed is a national strategy on the principal social and economic issues. The absence of such a strategy has been responsible for the failure of numerous public and private efforts, due to the continual changes in business rules and the consequent irrelevance of many programmes, along with the elimination of public offices that had provided useful services.

Argentina does not have a long-term strategy widely acceptable to the majority of political parties. As a result, there is no continuity in policy across changes in the presidency or— even more serious—changes in the Minister of the Economy. Lack of entrepreneurial spirit is a major calamity in a country that requires vigorous moves to realize the huge potential that remains unexploited or underutilised, while many other regions, which lack the resources that Argentina enjoys, are succeeding in developing their capabilities.

The present administration is, in effect, attempting to put out fires—dealing with short-term problems and facing monumental social inequities. While the government has ideas concerning the future, it has no coherent plan that includes strategies, key factors and long-term measures. What is required is a definition, and an agreement to establish the conditions for long-term development in a context of controlled uncertainty.

There are currently various measures to support the activities of SMEs in modernizing their structures, accessing more advanced technologies, and securing information and financial assistance to globalise their sales efforts. However, the needs these measures attempt to meet have not been adequately addressed by the authorities.

Following are some of the barriers facing SMEs:

- Most financial resources are available only when firms meet certain requirements, which are difficult for SMEs to meet, namely: lack of debt (difficult due to tax and social security contributions) and presentation of disaggregated economic and financial data.
- Lack of confidence in the continuity of government plans.
- Efforts to disseminate information are generally directed at general-purpose newspapers rather than at specific channels targeting the owners of firms.
- There is commonly corruption associated with this type of cooperative effort.
- Sharing personal information is an unwelcome experience for most owners and managers. This attitude is shaped by past negative experiences.

A positive perspective on the situation suggests an emphasis on tools useful in developing SMEs, expanding IT usage and increasing exports, including technology parks, partnership strategies, and the linkage of large companies with SMEs.

Technology parks and IT clusters appear to have the ability to act as accelerators of industries that are not yet fully developed.

This paper has mentioned the Cordoba Cluster, but the general concept could be replicated in relation to other features of the cluster. The experiment is viewed as successful based on a number of factors:

1. It proves that it is possible to organize a network of IT companies for the purpose of selling world-class products and services developed in Argentina or by Argentines, once a decision is made to confront the challenge of technology export, using a collective or partnership strategy to consolidate and facilitate a project that otherwise is difficult for SMEs.
2. The Cluster's members have been interconnected through a productive chain, a phenomenon uncommon in Argentina as a means of adding value.
3. The CCT was the first successful partnership project in Argentina, and has demonstrated the importance of working jointly with the provincial government and other IT actors.
4. This type of programme requires an academic component. In this case, 6 universities were engaged during different phases. This suggests the need to create a technology institute to enhance the skills of human resources.
5. When a non-typical effort is successful, there tend to be efforts to disseminate the example to obtain a replication effect. This can be seen when two clusters or technology poles are operating, while six or seven others are in their initial stages of existence.
6. Business alliances are not a prerequisite for launching a technology pole. The Cordoba and Rosario developments are the results of company agreements, with other components being added during the process. In the case of Tandil, it began as an academic project; the participants then sought to form the pole by inviting companies and authorities to participate in establishing an integrated development.
7. The recently approved law for the development of the software industry is aligned with this idea and may be considered a result of coordinated action on the part of the IT associations and chambers of commerce.

8. Effective dissemination of the idea is a principal factor in increasing the size of the cluster. The CCT group currently includes 36 companies.
9. The cluster concept has been demonstrated to be strong enough to survive during a period in which Argentina suffered one of its gravest economic crises, including external debt default. It is difficult to survive and grow without long-term financing, and most SMEs lacked any type of financing whatsoever. For a period of approximately 18 months, banks were not granting credit.
10. The cluster concept presents promising prospects: software development for customers located in foreign countries could reach 240,000 work hours over the next year.
11. Individual companies made progress in securing jobs abroad. They have increased sales, expanded their portfolios and, in some cases, opened subsidiaries. The process is still in its early stages, but the economic results are meaningful and are close to providing continuity and self-sustainability, opening up the opportunity to other domestic alliances or to the creation of Productive Collaboration Associations with companies in other countries.
12. The relationship with universities has had a highly synergetic effect on both sectors, orienting universities more acutely to demand, while at the same time causing technology companies to update, through the hiring of well-trained human resources.
13. The CCT initiated an important change: sharing information and engaging in joint efforts may be good business in a country where most technology firms thought that the government's purchasing power or parallel import barriers were the only means of assuring profits.

Export groups represent another significant tool for promoting foreign sales. The use of IT to coordinate activities and to standardize procedures and information are vital elements in maintaining the programme's sustainability.

Argentina's experience has demonstrated that achieving satisfactory group performance entails certain risks, and the small minority of survivors among consortia formed since 1983 is a sad testament to the difficulties involved. These include:

- excessive heterogeneity among participating firms;
- lack of balance due to excessive leadership by one firm, creating barriers to solid relations and trust among the group's members;
- discrepancy in goals or lack of agreement in prioritising markets;
- lack of flexibility in negotiations among members and with third parties;
- lack of commitment to achieving the group's objectives, with attention focussed exclusively on the interests of the individual firms.
- financial constraints of some members, hindering the realization of common activities;
- failure to engage in collaborative efforts to build common databases and related information systems;
- failure to define decision-making processes within the group, and
- insufficient power given to the coordinator.

One must, however, be optimistic, given the success that the grouping concept has had in recent years. The Bank of Boston Foundation and the Export.Ar Foundation have a successful export development programme.

The presence of a Foundation that supports numerous groups adds value to the activity. The foundation, for example, has prepared studies that are useful to more than one group, thus reducing costs and time involved. Some examples include:

- Analysis of the potential effects of a Chile-USA agreement on Argentine exports
- A guide for companies exporting to Sweden
- The importance of quality certification
- International Fairs (Expositions): an effective tool for global insertion
- How to gain a presence in the Brazilian market
- Export of Buenos Aires identity and culture
- Steps involved in the export process
- Calculation of export prices

The groups are active in various sectors: fishing, telecommunications, agro-machines, auto parts, producers of natural compressed-gas pumping stations, textiles, wines, eco-food, fashion, software and IT services, tapestry and decorations, honey, fresh fruits, dried fruits, olive oil, electrical products, industrial services, medical equipment, inputs and equipment for the plastic industry, and furniture.

One pending issue for the region is the construction of effective regional networks. Numerous organizations and networks can be found; however, what is involved is mostly intentions, plans and tentative beginnings, with no continuity. They engage in very little coordination, with each network trying to “capture” a niche by specializing in a particular sector or programme, thus creating (as noted earlier) an organizational vacuum for a more holistic approach to regional needs.

At present, 35 groups are in existence, totalling 250 firms whose exports total more than US 70 million dollars. While this may be considered a relatively small figure, the continuity of these groups is highly notable, and is a necessary basis for gaining the participation of other economic actors in this long-term process.



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