

Annex III

Computer Technology and Telecommunications in Brazil

Annex 3 – Computer Technology and Telecommunications in Brazil

3.1- Introduction

Though the areas of computer technology and telecommunications are both considered strategic for the country, they evolved in relatively separate manners throughout the last 3 decades.

A brief history and current overview of each sector are presented in this annex.

3.2 – Telecommunications

Beginning in the mid 1960s, the telecommunications sector evolved in Brazil as the tangible enforcement of a national policy that considered communications as strategic for the development and integration of the nation.

The first concrete step taken for effective state control of this area was the creation of Embratel, initially concerned with providing long-distance phone and, especially, TV signal transmission services. The popular saying “via Embratel” was coined at this time and is still heard today. Then, Telebras was established as the holding of practically all phone-operating companies in Brazil, grouped into companies on the state level. Embratel was also subordinated to Telebras.

The 70s decade witnessed the remarkable expansion of telecommunication services, with the quality of installation and operations on the rise as well. Special attention and care was paid to the implementation of infrastructure; a fact that came to distinguish Telebras from similar telecoms in other developing nations. Meanwhile, still in the late 60s and early 70s, remarkable progress was being made in the area of televised communication, epitomized by the broadcasting of a live nationwide news program, with live reports from various locations around the country.

An important milestone in the effort to set up a national and independent model for the sector was the creation, in the late 70s, of the Telebras Research

and Development Center (CPqD), aimed at assembling and erecting, in a single location, all research and development projects for equipment and services of the country’s telecommunications infrastructure. The ambitious initiative - which attempted to emulate both the method focused on research of a Bell Labs, for example, as well as the model focused on services of a Western Electric - led to the generation of various technologies, especially in fiber optics and commutation.

Beginning in the mid 80s, however, the sector’s global model of operations began to enter a crisis period, especially because of insufficient investment in the technological base, jeopardizing a much needed expansion and improvement of services. Meanwhile, in the principal nations of the world, the accelerated digitalization of lines and systems was followed by the emergence of new technologies and communication products, based on new languages and protocols. While the sector was decelerating in Brazil, it was beginning to pick up speed in the major nations.

The long crisis period in the evolution of Brazilian telecommunications lasted till 1995, when the Federal Government proposed new guidelines, which would be sanctioned by the new Law of Telecommunications, recommending the following:

- The privatization of the Telebras system;
- Conception of a system of duopoly for all services during a transitional period up to the end of 2001;
- Increasing and widespread competition as of 2002.

To carry out the duties of the State in this sector, it was also proposed that a national regulatory agency for telecommunications be created, Anatel, (described in Detail A3.1), which would begin operating in November of 1997, in the midst of the heated debate over the privatization of the entire Telebras system.

With privatization, the CPqD became a foundation of private law, keeping the physical installations of its headquarters in Campinas and the technological packages it had generated, in particular those of the “Tropico” family of commutation stations.

Detail A3.1



Anatel and the National Information Infrastructure

The National Telecommunications Agency (Anatel) was instituted in November of 1997 for the purpose of rendering a new model of Brazilian telecommunications viable, beginning with the definition and execution of the privatization process for the sale of the Telebras System. The General Plan of Grants (*Plano Geral de Outorgas - PGO*), which proposed the general rules for the process, was made available for public discussion exactly 30 days later.

ANATEL's fundamental job is to regulate, grant concessions and oversee telecommunication services in Brazil. This is a complex task to undertake. All procedural steps, proposals and decisions are submitted to widespread public scrutiny, aimed at conciliating the greater public interest with the particular interests of the private

Source: <http://www.anatel.gov.br>

sector, ANATEL, and other segments of society at large. In two years of operations, ANATEL has been responsible for producing the following documents, which give a concrete dimension to the critical aspects of the General Law of Telecommunications (*Lei Geral de Telecomunicações - LGT*):

- General Plan of Universalization Targets;
- General Plan of Quality Targets;
- Contract for the Concession of Hard-line Telephone Service;
- Obligation Protocol.

In September of 1998, ANATEL created the National Information Infrastructure Committee (*Comitê sobre Infra-estrutura Nacional de Informações - C-INI*) to discuss and propose actions for the development of the national communications infrastructure, based on the "demand-pull" approach. The committee was responsible, among other interesting results, for the proposal of Br@sil.gov, a national *backbone* for government services.

The success of privatization is visible today in the explosion of new services available, especially in the cellular phone area. Several operational problems on the field that had emerged seem to have been resolved. The beginning of operations of the various mirror-companies and the interest shown by corporations from other areas in getting into telecommunications seem to indicate a promising future for the consumer, especially when full-fledged competition begins in 2002.

In the area of wireless phone service, the evolution has also been considerable. In 1994, 800,000 people owned cell phones, while 5.6 million cell phones were in use in July of 1998. By December of 1999, there were 15 million cell phones in operation in Brazil.

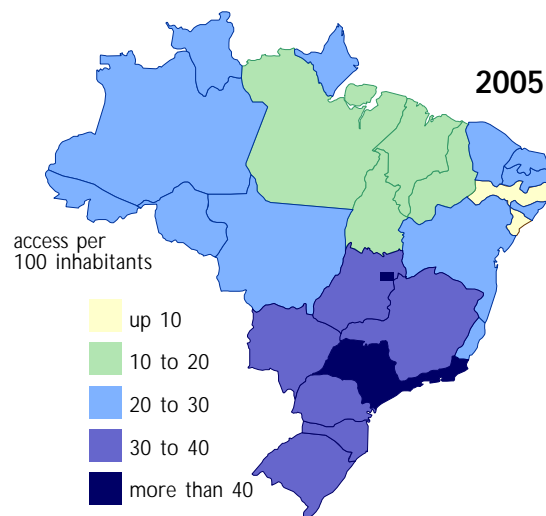
The privatization targets for 2005, in terms of telephone density (both of hard-line as well as wireless) in the various regions of the country, are quite ambitious, as Figures A3.1 and A3.2 show.

Privatization Results

In July of 1998, when 27 state-owned telephone companies were privatized, there were 20.2 million hard-line telephone accesses. The 34 hard-line telephone operators have installed, since then and up to December of 1999, 7.6 million new lines, an expansion of more than 37% in a year and a half. Likewise, the number of public telephones, during this same period, rose from 547,000 to 740,000. The main standards of quality also improved during this period, such as the network digitalization index, the average time to get a dial tone, the local and long-distance phone rates and the number of orders placed for repair services per 100 public telephones. More than 271,000 phones purchased through expansion plans that had not been delivered in December of 1998, were installed by May of 1999. Thus, with ANATEL ensuring that targets were effectively achieved by the telephone service concessionaires, the current status and the tendencies for the future evolution of telecommunications in Brazil have changed abruptly.

Figure A3.1

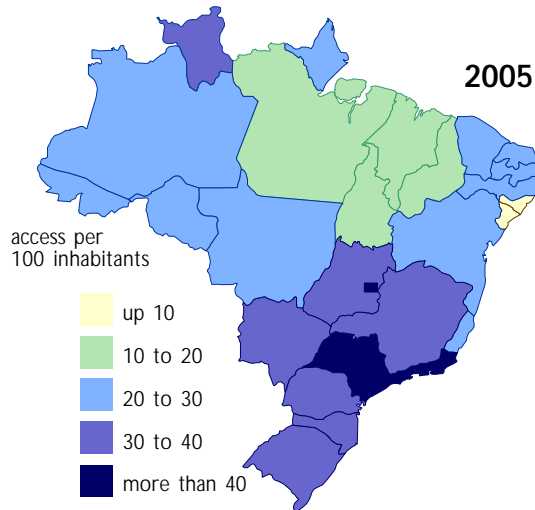
Evolution of Telephone Density of Commuted Hard-line Telephone Service (STFC)



Source: Anatel, Paste 2000

Figure A3.2

Evolution of Telephone Density of Commuted Mobile Telephone Service (SMC)



Source: Anatel, Paste 2000

3.3 – Computer Technology

Throughout the 70s and 80s, the computer sector evolved following a pattern equally centralized on conception, but comparatively more decentralized in terms of operation than the telecommunications area. The peak of government control of the sector occurred with the creation of the Special Computer Technology Secretariat (*Secretaria Especial de Informática - SEI*).

Basically, the national policy in this area advocated the establishment of a strong domestic industry, capable of manufacturing and improving equipment and software, as well as domestically producing a large part of the inputs necessary, such as integrated circuits, motherboards, discreet components, etc. In pursuing this target, the Federal Government relied on several measures, especially control over the importation of computer goods and services.

Between the late 70s and early 80s, the main directive for government action in this area was to make it possible for an industry of minicomputers (including both hardware and software) to emerge in Brazil, through the initial absorption of technological packages from abroad. Efforts towards this goal gave rise to companies like Cobra, Edisa, Scopus, SID and Labo,

which emerged or began to take off with the support of great banking conglomerates, like Bradesco, Itaú etc. These banks then began undertaking the great task of computerizing their operations all over the country.

By the mid 1980s, the focus of strategic actions in the sector shifted to personal computers, which were becoming more important, as were local networks. Dozens of companies entered this market to produce PCs and peripheral equipment (printers, disk units and controllers, video monitors, modems, etc.) to meet an ever increasingly demand. At the same time, a great niche of opportunity in banking service automation opened up, obviously under the strong influence of the large banks, leading to the creation of companies such as Procomp, Itautec and others. Finally, throughout this same decade, the industry of computer software and services grew considerably with the emergence of thousands of small and medium-sized companies, a significant number of which organized themselves in an association called ASSESPRO (as Detail A3.2 describes).

Detail A3.2



Assespro

ASSESPRO

The Brazilian Association of Software and Computer Service Companies (*Associação das Empresas Brasileiras de Software e Serviços de Informática - Assespro*), founded in 1976, has today more than 1,200 affiliated members in the area of ICT in 18 regions. A significant number of these companies are medium to small in size and work in the production of national software and hardware.

The organization is directed by a collegiate - with a president, vice president and 7 directors of themes or regions. The entity's Department for the Democratization of Computers and the Department for Mercosur Business reveal the great scope and aims of its activities.

Source: <http://www.assespro.org.br/>.

The 90s decade began with a sudden shift in the country's computer policy in the direction of a more open model, symbolized by a significant reduction of import dues for several items. However, the government's concern with providing support for the computer industry installed in the country and for domestic production led to the sanction of Law 8,248 of Fiscal Incentives in Computer Technology.

The beginning of the decade was marked by the introduction of several national initiatives in the computer area, under the auspices of the MST, such as the:

- National Research Network (*Rede Nacional de Pesquisa - RNP*), aimed at implementing the Internet for educational and research purposes in the entire country;
- Thematic Program of Computer Science (*PROTEM-CC*), aimed at structuring and supporting a model of research through a consortium between academic entities and the private sector;
- National Software for Exportation Program (*Programa Nacional de Software para Exportação - SOFTEX*), aimed at structuring and coordinating a nationwide effort to significantly boost the exportation of software produced in Brazil;
- National System of High Performance Processing (*Sistema Nacional de Processamento de Alto Desempenho - SINAPAD*), aimed at setting up a series of centers to render super computational services in the country.

For their development, the first three initiatives were placed under the joint coordination of SEPIN and MST (Detail A3.3), forming the so-called Priority Computer Programs (*Programas Prioritários em Informática - PPI*), according to the terms of Law 8,248.

Detail A3.3 Sepin/MCT



The Secretariat of Computer and Automation Policies (*Secretaria de Políticas em Informática e Automação - Sepin*) of the Ministry of Science and Technology is responsible for the conception, implementation and monitoring of industrial policy in the area of information technologies in Brazil, with a special focus on equipment, software and microelectronics. The agency is also in charge of managing all aspects related to the Law of Fiscal Incentives in Computer Technology (Law 8248).

Understandably, it's SEPIN that effectively coordinates all actions related to industrial policies in the Information Society Program.

Source: <http://www.mct.gov.br/>

The four initiatives enjoyed considerable success in their initial phase. The RNP research network in particular played a crucial role, not only in the setting up Internet services for the academic area, but especially in the transition and assembling of a model for open Internet services in the country. On the other hand, the PROTEM-CC program taught the research community how to set up joint projects with the Brazilian private sector and research groups abroad.

By 1996, however, the Priority Computer Programs then in existence were beginning to exhaust themselves, due to problems of institutionalization, financing and even the need to redefine the strategic goals. In 1997, at the initiative of the National Science and Technology Council, a study was undertaken on the possible outline of a national program of Technologies for an Information Society, involving around 150 specialists on 10 work fronts. The project that resulted from this study was approved by the Council at the end of 1998 and, in mid 1999, gave origin to this present Program.

National Research Network (RNP)

The RNP, besides providing pioneer Internet services to the academic community of Brazil, allowed for the qualification of a large and important contingent of professionals, with knowledge of the application of state-of-the-art technology in networks and with practical experience in the operation of services. They were able to meet the needs of a very demanding public - the academic community. Thus, when the Internet stopped being a purely academic network in Brazil, with the growing interest of companies in cheaper communication via electronic mail - and, later, in a more primitive form of electronic business, utilizing websites as electronic showcases and catalogues - this contingent of experienced professionals was ready to help Internet providers and users rapidly learn how to use the new technology applications.

SOFTEX 2000

The National Software for Exportation Program (SOFTEX) was created by the MST in February of 1993 to try to convince Brazil's computer industry to switch the focus from equipment to software; from

the domestic market to the export market; from small-scale production to large-scale production.

The Brazilian Society for the Promotion of Software Exportation (SOFTEX), a non-profit civil organization, was established on December 3rd, 1996, to begin administering the SOFTEX program as of January 2nd the following year. Since 1999, the actions undertaken by the program have been based on the priorities established in the government's four-year development plan, the 1999-2002 Governmental Plan (*Plano Plurianual*). The target to be achieved is for Brazil to be exporting software and related services in the value of US\$ 250 million a year by the year 2002. For this purpose, SOFTEX supports initiatives aimed at the generation of new companies, at teaching companies how to export, at financing exports and assisting in the sale of Brazilian products abroad.

The SOFTEX program has 21 agents, 19 regional nucleuses, 6 international offices (Austin, Boston, San Jose, Düsseldorf, Beijing and Buenos Aires) and 2 international commercial agents (Australia and Spain). The 21 SOFTEX agents, distributed mainly among the nation's universities, work to bolster the generation of new software and Internet companies. As a result of their efforts, the number of software and/or Internet companies to enter the market has been expanding: 10 in 1997, 39 in 1998 and 39 in 1999.

Government spending in the SOFTEX program totaled R\$ 150 million in December of 1999.

PROTEM-CC

The Multi-Institutional Thematic Program in Computer Science (*Programa Temático Multiinstitucional em Ciência da Computação - Protem-CC*) is aimed at bolstering the scientific and technological research necessary for the development of ICT in Brazil. It's a program developed by the National Council of Scientific and Technological Development (*Conselho Nacional de Desenvolvimento Científico e Tecnológico - CNPq*) aimed at giving greater impetus to research and to the training of qualified personnel in the area of Computer Science in Brazil. These goals are achieved by promoting greater cooperation between research groups in the country, as well as between the research

area and the industrial sector, by developing multi-institutional projects around themes and problems considered to be important.

SINAPAD

The National System of High Performance Processing (*Sistema Nacional de Processamento de Alto Desempenho - Sinapad*) is an initiative focused on encouraging the employment of high performance computation by the academic community and corporations, to raise the level of competitiveness of Brazilian services and products. During the period of 1992 to 1999, it was coordinated by the Ministry of Science and Technology's Studies and Projects Financing Agency (*Financiadora de Estudos e Projetos - Finep*), which was also its main source of financing.

SINAPAD emerged in the late 80s and early 90s, when a vital need was felt to reequip the computational structure available to the academic community, and to raise its computational capacity to a new level. In order to make the best use of the funds available, it was decided that the highest level of computation capacity should be concentrated in a few centers and that the services available at these centers should be made accessible to many users by means of a communication network, primarily the RNP. The success of the system for the distribution of access, via this communication network, depended on the availability of adequate services in the RNP, in terms of the location of points of access and the speed and reliability of the communication.

SINAPAD began operations with the inauguration of the first national center of high performance processing (the Cesup-RS) in July of 1992, at the Federal University of Rio Grande do Sul (UFRGS). Other national centers followed in São Paulo, Ceará, Minas Gerais and Rio de Janeiro - six in all.

Up to around 1996, SINAPAD was very useful for academic production in Brazil, contributing to the qualification and education of specialists and allowing for the development of advanced applications in scientific computation - for scientific research purposes and for the development of projects in the various branches of engineering.

More recently, however, problems involving funding, institutionalization and support for high-speed networks have led to SINAPAD's decline. The program has lost a great deal of its competence, computational capacity and technological up-to-dateness. The entire system of high performance processing services in Brazil must be reviewed, without which it will be difficult to recover the achievements of SINAPAD's efforts in the past.

3.4 – Current Status and Prospects

The Computer Technology Economy in Brazil (encompassing all types of goods and services involving computers and telecommunications) is currently in the order of US\$50 billion a year, as illustrated in Table A3.1.

Table A3.1

The Computer Technology Economy in Brazil

Sales

Classification of sectors – total gross operational earnings – in US\$ billions – 1998

1	Basic communication services	23,9
2	Computers, peripherals and components	10,2
3	Network and telecommunications infrastructure	5,7
4	Operational, consultation and distribution services	2,7
5	Products and services specialized in communication	2,4
6	Basic software, for production and management	1,3
7	Internet providers and services	0,1
	Total	46,3

Source: Info Exame - agosto/99

As occurs in the main countries, the sector of the economy linked to ICT is today one of the most dynamic in the country, with a catalytic effect on the whole economy. It's worth noting that in the USA, between 1995 and 1998, this sector was responsible, on average, for more than a third of the total real growth of the American economy. Furthermore, prices of ICT goods and services dropped 7% between 1996 and 1997, leading to a drop of inflation of 7/10s of a percent each year. This phenomenon helps to explain the fact that the American economy, in the last few years, has been able to keep inflation at bay and interest rates low, while growing at an average rate of 5% a year.

In Brazil, the widespread impact of ICT (especially after the achievement of some strategic targets, such as the privatization of telecommunications) is only now beginning to be felt. Analysts predict that the great Brazilian leap forward may occur in the second half of the decade, considerably behind many nations. The Information Society Program will work to turn this forecast into reality sooner than expected.

The Computer Sector

According to SEPIN, the computer industry grew nearly 14% in 1999, with the sale of computer goods and services generating revenue of R\$ 25.6 billion. During this period, the hardware segment grew 14%, software expanded 15% and the area of computer technical services increased 13%.

It's estimated that there are nearly 9 million computers in operation in Brazil, with projected annual growth above 30% by the year 2001. A close analysis of 1999 reveals that for every 1 billion in GDP, Brazil possesses nearly 11,400 working computers. The computer sector, currently, employs 100,000 workers directly, being that 36.23% are college graduates.

The quality of computer products and services is also of great concern to SEPIN. Due to market demands, companies and firms in this area have been adopting modern systems of quality management. Currently, there are around 198 computer companies in Brazil with ISO 9000 certification.

As the main instrument of implementation of the National Computer Policy, SEPIN can use the mechanisms made available through Law 8,248 of Fiscal Incentives in Computer Technology.

The results obtained with the incentives provided by this Law, during the period of 1993 to 1999, are quite remarkable. A close evaluation of these results reveals a significant increase in investments in the

R&D in Brazil, as a result of the law's incentives. In 1999, 183 requests for fiscal incentives were approved, filed by 263 companies.

The Law has managed to attract a number of domestic and foreign investments for the implementation, expansion and modernization of Brazilian industry.

Investments in R&D also rose significantly, being that a total of R\$ 600 million was spent in 1999 in this area by companies that took advantage of the incentives available through legislation. Of this total, R\$ 225 million was money spent in a partnership of private corporations with universities and research centers.

During 1999, the MST's Priority Programs received a significant volume of financial and material resources - a total of R\$ 15 million, resulting from the payment of charges established through the Computer Technology Law. With this money, the government was able to strengthen projects for the qualification and development of human resources in the area of R&D, to expand the national Research Network and bolster the exportation of software.

Local Technology

Since the 70s decade, one of the main directives that steered both telecommunications as well as computer policy in Brazil was the emphasis on the command of technologies and on the domestic production of equipment and software.

Throughout out the 90s, this directive was placed on a back burner in the telecommunications area, not only in Brazil but the world over, due to the need to speed up the efforts of countries and blocs of nations in the direction of an information society, in light of the deregulation and opening up of telecommunication markets. This was one of the main motivations behind the European Union's recommendation to its member nations that they privatize their state-owned telecommunication companies.

The concrete results achieved by many nations with the privatization of telecoms seem to corroborate this thesis: in general, the offer of communication services has risen considerably and, to a lesser degree, the fees for telephone and communication services have dropped appreciatively, due both to free competition, as well as to the introduction of technologies with a better cost/performance ratio. However, the proclaimed free competition of telecommunication services isn't reflected in the area of implementation of the infrastructure needed for these same services, in the domestic markets of the main countries of the world. Table A3.2 shows the status in 8 nations, including Brazil, through which it becomes clear that the domestic market of commutation equipment in each country is largely dominated by local manufacturers. Brazil faces, therefore, a formidable challenge, which is to try to keep a significant parcel of its market of telecommunications equipment in the hands of national technology.

Trade Balance in Information and Communication Technologies

The status of commercial trade in the computer sector has been deteriorating continually since 1992, with imports surpassing exports in ever increasing volumes. This situation became even more serious beginning in 1995, when the value of imports reached into the billions of dollars, while exports, highly concentrated in a few leading companies of the market, remained practically stagnant. In 1997, imports more than doubled, surpassing the value of exports 5-fold. The expansion of the Internet in

Table A3.2

Digital Commutation Equipment – Domestic Markets

Markets	Manufacturers	Share of the Market %
USA	Lucent (50), Nortel USA (32)	82,0
Canada	Nortel	84,0
Germany	Siemens (67), Alcatel Germany (31)	98,0
Sweden	Ericsson	97,0
France	Alcatel	88,0
Italy	Italtel	54,0
Japan	Fujitsu (23), NEC (29), Hitachi (22), OKI (19)	93,0
Brazil	Ericsson (17), Siemens (23), NEC (17), Tropic (31)	88,0

Sources: Sepin/MCT

Brazil is basically sustained through the importation of telecommunication equipment, and the trade deficit in this sector is on the rise.

Table A3.3 synthesizes the current situation.

Table A3.3
Brazil: Trade Balance – Computer Technology and Telecommunications 96/99 (in US\$ million)

Discrimination	1996	1997	1998
Importations	4.126	5.357	5.008
Computers and peripherals	2.662	3.070	3.015
Telecommunications	1.464	2.287	1.993
Exportations	382	553	592
Computers and peripherals	289	329	337
Telecommunications	93	224	255
Deficit	-3744	-4804	-4416

Source: Sepin/MCT

Local Manufacture and Exportation

The efforts made towards the generation and utilization of domestic technologies is economically justifiable when analyzing the evolution of the country's foreign spending. The growth of the sector of the economy linked to ICT in Brazil obviously implies in a growing and concurrent need to import inputs for the production/exploitation of computer and telecommunication goods and services in the country. Such inputs include motherboards, optical/electronic components, software, etc., which are added to other items produced on the domestic market (such as video monitors and other components) to assemble finished products. Currently, in the measure that the demand for numerous technological items rises in the country, it becomes feasible and even necessary (from the point of view of cost) to produce more and more of these items in Annex III in this country. Therefore, critically planned initiatives to replace the importation of items of high technological density for those produced domestically have their place in the new economy.

Conditions are such that the exportation of ICT products will become an increasingly more strategic option for Brazil, since:

- Great manufacturing corporations, that operate on a global scale, are setting up plants in Brazil to produce, domestically, goods for both the Brazilian market as well as for exportation;
- Secondly, the companies that supply parts, components and services of high technological density in the areas of computer technology and communications create a working environment that is highly favorable to the generation of new innovating products;
- And lastly, companies with a long tradition in the Brazilian computer and telecommunications market, once repositioned in the highly competitive domestic market, become qualified to dispute markets abroad.

Generation and Transfer of Technologies

The R&D community in ICT in Brazil is highly qualified (being that a large part of them are returning from post-graduate programs in the best universities abroad), as well as very active and integrated. They regularly produce results that are very important and beneficial for worldwide scientific and technological advancement in various state-of-the-art areas of ICT.

However, there are some critical challenges to be overcome:

- In quantitative terms, there are too few researchers in the R&D community to help the country face all the challenges that will undoubtedly arise in upcoming years. This problem and possible ways to resolve it are discussed in Chapter 5 – Education in the Information Society.
- In terms of distribution, another problem that becomes quite evident is that the Brazilian scientific community is concentrated, in large part, in universities and research centers - to the point that only 2 to 3 researchers out of 10 are working

in industry. Though there is no specific data regarding this problem in ICT, it's not preposterous to suppose that the situation is even more serious in this area. This tends to make it harder to pinpoint and focus on strategic actions for a series of key-technologies, as is proposed in Chapter 7 – R&D, Key-technologies and Applications.

- Finally, a third aspect to note is the low rate of transferal of technology generated in academic circles to the Brazilian industrial sector. This matter is extremely complex and demands a detailed study. It's worth noting here that strategic actions to change this will become necessary, in order to introduce concrete measures able to counterbalance the natural tendency for this problem to only worsen, in the measure that privatized companies or those absorbed by larger corporations begin to have access to technologies from their headquarters overseas.

Tendencies in the MST

With the fiscal incentives provided by Law 8,248, the country's computer and telecommunications industrial park clearly expanded. However, the manufacturers of peripherals, components, semi-conductors, industrial automation and digital instrumentation reduced their industrial output, which clearly indicates the need to create new mechanisms and instruments to bolster these industries.

With this goal in mind, SEPIN has actively participated, together with other government agencies, of efforts undertaken by the BNDES to finance the purchases - by the new operators of the A and B bands of wireless phone service - of products manufactured domestically.

Another initiative, begun in 1998, is being developed jointly with the Brazilian Association of the Electric and Electronic Industry (*Associação Brasileira da Indústria Elétrica e Eletrônica - Abinee*) and the Brazilian Association of Subscription Television (*Associação Brasileira de Televisão por Assinatura - ABTA*), as well as with federal government agencies, for the purpose of advancing domestic production of parts,

components, cables and equipment used by companies that render cable and satellite-based TV services. After certifying the viability of the undertaking, the federal government pursues ways to encourage domestic production. For those components not produced locally and that need to be imported, the government considers the possibility of reducing import dues. With these measures, a significant reduction in the price of services may result, leading to an increase in the number of paid TV subscribers. Once again, the BNDES would act as a potential financing agent for the purchase of items produced domestically.

Multinational corporations that have set up and expanded their manufacturing plants in Brazil have been able to supply the needs of the South American market and are exporting increasingly more to the Mercosur trade bloc and other neighboring countries. Their exports to Mercosur nations are benefited by compliance to the Regime of Origin (*Regime de Origem*), which in most cases is similar to the basic productive process, a necessary prerequisite for the corporations to benefit from an exemption of the IPI (tax over industrial production).

