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Latin America on its path into the digital age: where are we?

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Abstract

This paper is part of an investigation about the impact of modern Information and Communication Technologies (ICTs) on Latin America. Based on the theoretical groundwork given in the introductory paper ("From industrial economics to digital economics: an introduction to the transition"[1]), the present paper gives an inventory of the state of development with regard to the regional transition to the so-called Information Society, in order to untangle and structure present dynamics. As knowledge and information are becoming the focus of activity, penetrating and dominating capital, natural resources and the workforce, degrees of development will be determined by the capacity to manage and take advantage of technologies that support the processing of information and the generation of knowledge. Analyzing the special characteristics of Latin America with regard to the integration of Information and Communication Technologies, five fields of focus are identified, for inclusion into development theory: access, regulatory framework, financing, education and the so-called soft factor (eWareness). Latin America is currently given a historic opportunity with regard to improving its relative degree of development, if joint efforts can focus on setting an agenda for guiding the region smoothly and rapidly into the Digital Age.

[1] Hilbert, Martin R. (2001a), Serie CEPAL, Serie Desarrollo Productivo, February 2001, Nr. 100; http://www.eclac.cl/publicaciones/desarrolloproductivo/7/lcl1497p/dp100.pdf .

I. New basic conditions

> "…the focus is changing. Coherences appear "in a different light". …(But it) is nothing mystic, it just needs to be untangled. … The New Economy is not really reflected in the daily rise and fall of the Nasdaq. In allusion to the great Immanuel Kant (1724-1804), we could say that in the long run our "Formen sinnlicher Anschauung" (Kant, 1787)[2] are getting influenced –since the two principles of …(them) are time and space." ("From Industrial Economics to Digital Economics: An Introduction to the transition." P.124)

In less than a decade, modern Information and Communication Technologies (ICTs) have changed the way we communicate, work, study, think and live, forever. The genie went out of the bottle, and no Nasdaq is able to put it inside again. Never in history has mankind experienced such a concentrated impact of progress. The world seems to spin faster now, due to a "digital nervous system" (Gates, 1999) that spans it. The transition we are living in is all penetrating, all embracing and generic and will lead to the creation of a new society -- the so-called "information-", "knowledge-" "hyperlinked-" or "networked society[3]". At this moment, in no region in the world this impact is being adopted as quickly as in the Latin American region.

Like all of society, the world economy is also in the midst of a profound transformation. The cumulative effect of the micro-level changes in firms and their markets is evoking a macro-level shift to an

[2] Kant, Immanuel, "The Critique of Pure Reason", www.wmelchior.com/wis/philo/kant/works/kdrv.txt .

[3] …as I like to term it, referring to the global interconnectivity and the information exchanging and knowledge creating forces which are unleashed.

increasingly knowledge-based global digital economy. The new global-information-infrastructure is an extreme accelerator for globalization. It is often driven by the private sector, making it a globalization "driven by the people". While analyzing the actual state of development with regard to the transition from the industrial age to the digital age and its networked world, we have to keep in mind that we are not pursuing the expansion of Information and Communication Technologies as an end itself, but rather as a mean for increasing economic growth, improving social standards, or stabilizing democracy --in short: to improve the relative degree of development of a society.

It is clear that the first countries to enter the networked- or information society are reaping the greatest rewards, and they will set great part of the agenda for all that follow. By contrast, countries which are behind, could --in the short term--, face disastrous setbacks. Latin America is seen as a "perpetual latecomer". The region came late to the world's process of industrialization, and has suffered from it ever since. Now the world is proceeding into the digital age, which is surely an evolution from the industrial world setting, and therefore closely related to it. But the world is ever "evolutionizing" and settings can get mixed up, especially during an all-penetrating vertigo as right now. Remembering Charles Darwin (1809-1882), we know that it is not the strongest, or most intelligent that survives, but the one that is able to adapt to changes most flexibly[4] (Darwin, 1839; 1859). This is bringing up potential costs, but also unique opportunities for the region[5].

On balance, we might not be sure yet where we are going- but we already know that we are going there very fast! "Unfortunately we often tend to overestimate the short term impact of changes and forget to consider the long term effects." (Hilbert p124, 2001a). What is commonly understood as the "Internet" today, will be the "networked world" of tomorrow. To refer to the "Internet" as a computer with a browser, would be like explaining the term "multimedia" by mentioning a gramophone. We are living in a world where every human conduct is based on the exchange of information and on communication, and we are evolving to a networking model based on connectedness to information and communication technology that is transforming into a expansive and pervasive framework that touches every aspect of our lives. This paper describes what is known about the transition "from bricks to clicks" in Latin America until now, in order to draw conclusions about where the focus of further development needs to be set.

1. Revolution, evolution or hype?

> "One thing we can see already is that the Internet diffusion is a lot quicker, compared to when the 'old inventions of the past' invaded the planet, and that the Internet is turning out to have a greater economic impact." ("From Industrial Economics to Digital Economics: An Introduction to the transition." p.12)

The general conscience about that modern ICTs (like cellular phones or the Internet) are existing and governments' recognition of it, is amazingly high in Latin America, in comparison with other developing regions[6]. In comparison with leading developed countries however, Latin

[4] Darwin's **theory of evolution** holds, simply, that the survival or extinction of each organism is determined by that organism's ability to adapt to its environment. Darwin's principal thesis became central to all kind of modern scientific thought.

[5] **ECLAC ("Latin America and the Caribbean in the transition to a knowledge-based society", Florianópolis, 2000): "In Summary, as has been proposed by the working group of the United Nations Commission on Science and Technology for Development, although the cost of making the transition to an information and knowledge-based society is high, Latin America and the Caribbean must take up this challenge because the cost of not doing so are even greater." …two questions remain: first WHEN? and second: why talk about costs and challenges- why not about the benefits, chances and historical opportunities we would loose?**

[6] Like the fact that almost every established newspaper in the region does have an online extension, and is in most of the cases also maintaining a special "Technology- or Internet section", where it is frequently reported about the state of development. Or political statements:

America has, generally speaking, a lot to catch up[7]. Nevertheless the region is the world's fastest growing Internet community. At times behind, at the same pace and in some respects even faster than developed countries the region has entered this "time of great structural change" and is hurrying to leave the industrial age behind. So how big is the expected impact of all this talk about the transition to a "knowledge-based" or "networked economy"?

Looking at the GDP structure of Latin America, it seems obvious that the implementation of a so-called Digital Economy, should provoke a very profound and decisive impact on the region. "Wholesale and retail trade", "restaurants and hotels", "transport, storage and communications", "finance, insurance, real estate and business services community", "social and personal services" and "government services", make up almost 70percent of Latin Americas GDP (1997: 67percent, 1998: 68percent) (ECLAC, 2000). From basic theories of Digital Economics and the Information Society (see Hilbert, 2001a) (theories which have mainly been elaborated in the most industrialized countries though), it is known that the use of modern ICT do have a major impact on all of these sectors. Combining Latin America's GDP structure and Digital Economic basics, it is expected that the economic organization, business models and manners, most production processes and value chains and therefore also productivity of at least these industries, will undergo profound changes in the near future, while the transition from Industrial- to Digital Economics is evolving.

Furthermore there is cross-country evidence that telecommunications rollout facilitates economic growth (infodev, 2000). The Internet's power to leverage a network connection suggests that this link will only be stronger, and there is already evidence for this. The development of information technology (proxied for example by the number of Internet hosts and personal computers) is linked with what some economists call the "economic creativity of nations". The Internet is highly positively correlated with innovation, start-up of new business and technological transfer. This correlation of ICT and "economic creativity" can already be observed in Latin America, the same as in other regions of the world (see Chong, 2001).

The region just recently entered the race, which involves almost every country in the world. Even though in 1995 all Latin America and the Caribbean (except Honduras) have been connected to the Internet already (Landweber, 1996), all major countries in the region entered the year 1998 with less than one percent of their population being connected. After that, the "Internet-high-speed-evolution" (Hilbert, 2001a) took off in Latin America.

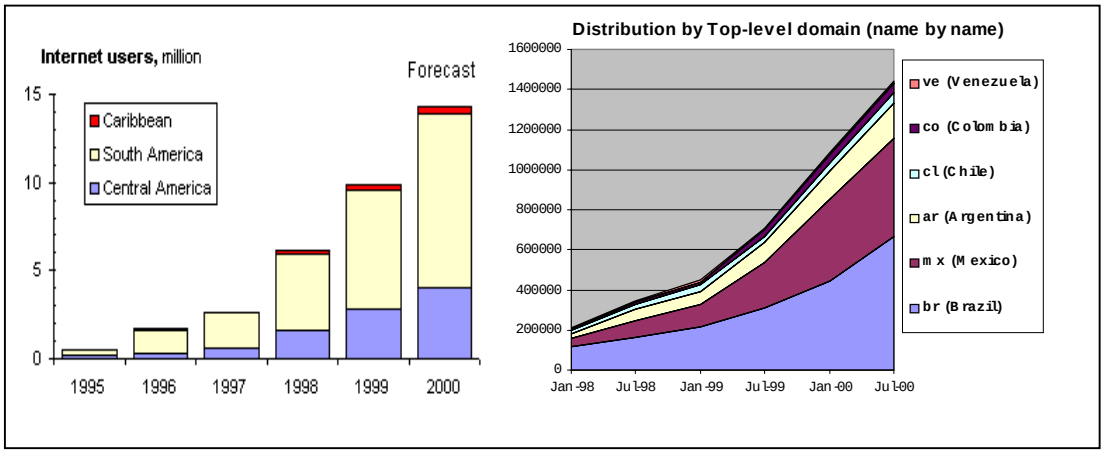
Internet usage might have started to explode around 1998 already (see Figure 1, left), yet active participation of Latin Americans in cyberspace just started to gain significance during 1999 (see Figure 1, right).

Declaration of Florianópolis (Santa Catarina, Brazil, June 2000):
"…ICT represents the central pillar for the construction of a global, knowledge based economy and society, and constitutes the basis for new forms of organization and production."
"…(asserted that) the shared aspirations of Latin American and Caribbean countries to become full-fledged members of the information society by the year 2005 on a efficient, effective and sustainable basis within the framework of the global knowledge-based economy."
Declaration of the **Summit of South American Presidents** (Brasilia, Brazil, September 2000):
"…(called for) an acceleration of efforts to access the information and knowledge society and the creation of a South American Fund to achieve it."

[7] A recent survey of the Comunidad Andina revealed that out of 1085 businessmen 36percent consider the Internet as very important, 33.2percent as important, 21percent not important, and 6.7percent not at all important (Comunidad Andina, 2000).

Figure 1

EXPLOSIVE CYBERSPACE PARTICIPATION IN LATIN AMERICA



Source: ITU World Telecommunication Indicators Database 2000; ISC, 2001

As a result of this infant development, much of the present research is based on estimation or sporadic, anecdotal evidence.

In Latin America the generic dynamics provoked by the Internet occur at an unprecedented speed. While U.S. retailers spent the last six years cultivating their online retail industry, "in Latin America, pure-play and bricks-and-mortar retailers alike are having to compress this process into the space of one to two years. Not only do online retailers need to iron out some of their operational difficulties, they also have to develop business models suited to the unique challenges and characteristics of the Latin American market." (BCG, 2000a)

But also consumers understood quickly how to profit from the new possibilities. While more sophisticated Internet applications (like e-commerce) still face some implementation problems, simple and especially cheap online applications (like e-mail, Peer-to-Peer techniques[8], chat, SMS[9] etc.) get euphorically welcomed by the regional population. According to a survey of AOL Latin America, 75percent of the questioned consider their e-mail address more known as their Telephone number.

2. Latin American Special Characteristics

To begin with, Latin America is a very "fortunate" region. The vast majority is conversing in only two different languages, which are even very similar in their written form[10]. This is very helpful because information and communication and therefore everything related to modern Information and Communication Technologies, is basing on data which is mainly codified by language.

So who are the Latin American "internautas"?

On average the online profile in Latin America is very similar to the ones in developed countries. Almost half of the online population is younger than 25 years old (Brazil: 49%; Mexico: 55%; Argentina: 44% (eMarketer, 2001)) and almost two-thirds of the "onliners" do have higher education (Media Metrix, 2000, U.de Chile, 2000). While in 1997 around 76percent of the region's

8 Like the famous Napster.

9 Short Message Service, a service which enables to send short (usually up to 120 characters) written messages over digital mobile networks for a minimum cost.

10 Great advantage, in comparision with other regions like Papa New Guinea, where around 700 languages are getting spoken...

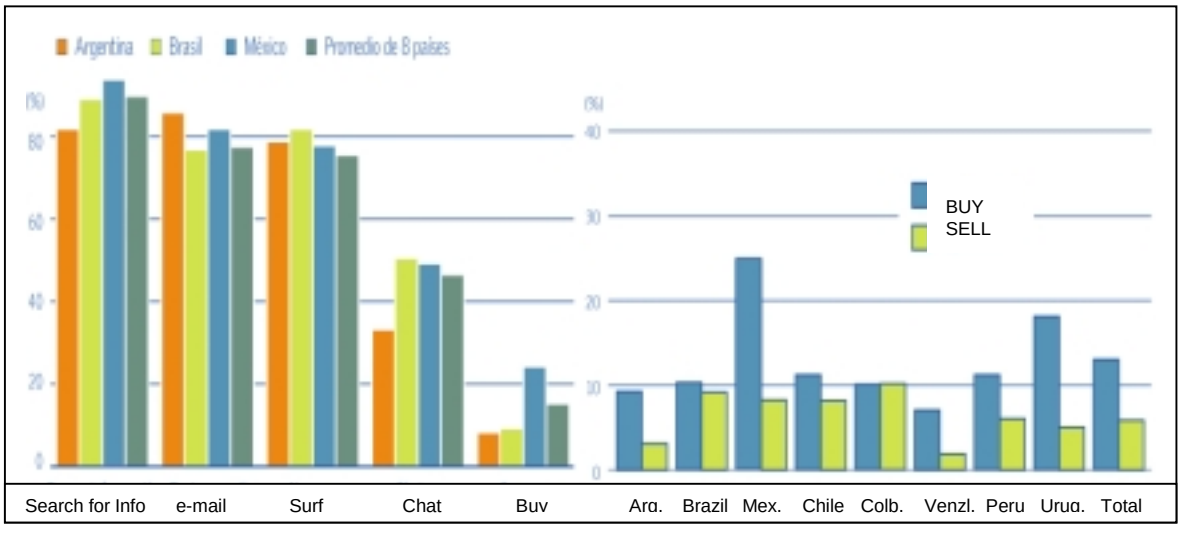
online population have been male (TGI Latina, 2000), actual development is driving fast towards **gender parity**. In January 2001, 57percent of the Brazilian users were men, for example, and they surfed for an average of 8.04 hours per month. Women (43percent) spent an average of 5.5 hours online (Ibope, 2001). According to a report of Certifica.com of January 2001 the average online surfer accomplishes around three page views per session (3 in Argentina, 2.35 in Chile, 3.29 in Peru, etc). The time of one session is around six minutes (5.85 minutes in Argentina, 5.6 in Chile, 6.5 in Peru). Online surfing reaches its peak on weekdays around 15.00, 22.00 and 23.00, according to the report.

Even though the actual number of Internet users in Latin America is not clear (do to measurement problems, see Chapter I.1.3), there is enough information available to discern the present pattern of use. Overall, the primary use of the Internet is for information and entertainment. This would include reading online publications, visiting educational or government sites, visiting news or chat groups, or just surfing around on online Portals; but also visiting company sites, obtaining company information, and obtaining information for potential purchases (Latinnews, 2000; IPSOS-ASI, 2001). The percentage of actual online shoppers is pretty low in Latin America (see Chapter III.1.2).

From the macro-perspective, the world can get classified in three major groups:
First, countries that already have implemented and are using the new tools actively. They are producing goods in a (more or less) small, but established Digital Economy. Secondly there are countries, which understood the benefits and importance of the new tools (e-wareness), but rather use them passively. They are consuming goods in a Digital Economy. And thirdly, countries that not yet discovered for what and to what extend the new tools serve. Latin America as a whole clearly left the third stage around 1999, but still did definitely not yet reach stage one (see also Chapter III.1.1: e-Readiness).

Figure 2

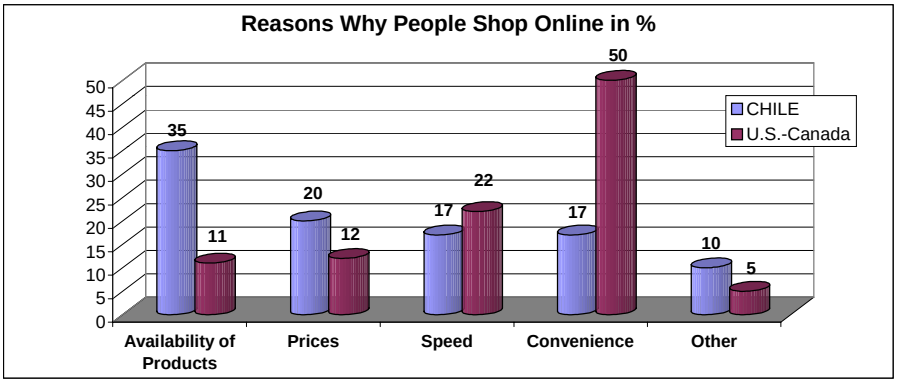
SURVEY ABOUT LATIN AMERICAN ONLINE ACTIVITIES



Source: IPSOS-ASI; http://www.ipsos-asi.com

Moreover, Latin Americans definitely do see different benefits in the worldwide web as their northern counter parts, for example. They use the new tools out of other reasons:

Figure 3
DIFFERENT PRIORITIES IN DIFFERENT REGIONS



Source: U.S.-Canada: Forrester Research; Chile: Universidad de Chile

It is essential to understand and remember that basic conditions, overall development and specific motivations related to the adoption of modern ICTs differ from other regions of the world. The given paper describes some of these differences, which is essential in order to understand the characteristics of the transition in Latin America. The region will definitely go a different path than the developed world is taking, facing different obstacles and therefore calling for different solutions.

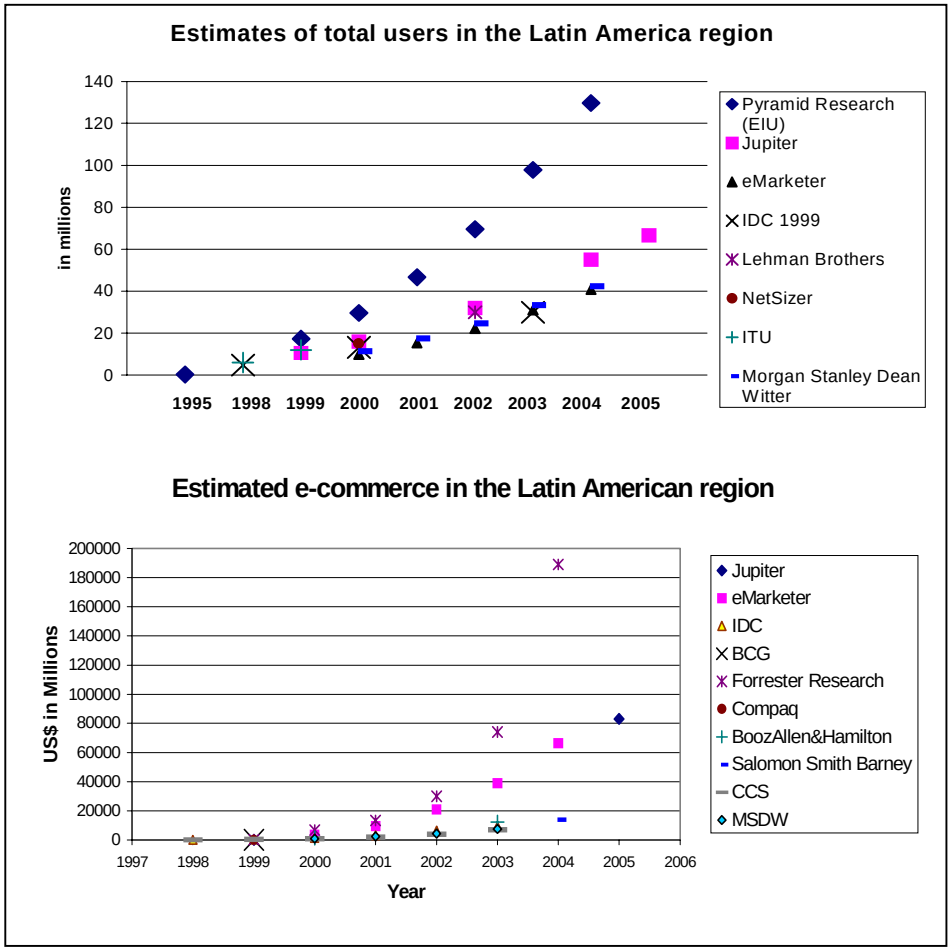
3. Measuring the digital economy

> "There is no common consensus yet about what one means by the digital economy for data collection and measurement purposes." ("From Industrial Economics to Digital Economics: An Introduction to the transition." p.23)

It is hard enough to give solid estimates on further advanced Digital Economies like the United States. In emerging markets like Latin America, the task is much more difficult, because statistical representation did not yet become critical. Like this many private market researchers do not yet dedicate more resources on developing research techniques in the region. As our analyzes will make clear, estimates and projections about Latin America's Digital Economy vary (sometimes extremely) (see Figure 4). From two of the most recognized private research agencies in the field of the Digital Economy, one (eMarketer) is claiming for 9.9 million online users in the region in 2000, while the other one (Pyramid Research) is counting 29.694 million. Morgan Stanley Dean Witter saw US$1000 million flowing through e-commerce channels in 2000, while Forrester Research accounted for US$6800 million. These divergences are generally due to differences in methodology or in definitions. Starting with simple questions like for example, how many Internet users are entering the Web through one single Internet host[11]? Definitely this number varies between countries. For example, in a country like Peru, where public access is making a huge proportion of Internet access totals, this number is expected to be higher than in the United States (Netsizer.com claims for about 2.3 users per host in the US, and about 81.1 in Peru, 02/2001).

[11] Counting the number of Internet hosts themselves may only be interpreted as the minimum size of the Net. Telcordia's NetSizer, for example, solved the problem by taking random samples of IP addresses. Like this it is possible to give daily updates of the number of Internet hosts and users, and to estimate the number of "active" participants in cyberspace. NetSizer collects and analyses the data continuously, therefore estimates are provided on a real time basis (www.netsizer.com). See also: www.nua.com/survey/how_many_online/index.html .

Figure 4
HIGHLY VARYING STATISTICAL INVESTIGATIONS AND ESTIMATIONS



Source: EIU, Jupiter, eMarketer, IDC, Lehman Brothers, NetSizer, ITU, MSDW, CCS, BCG, Forrester Research, BoozAllen&Hamilton, Salomon Smith Barney.

EMarketer uses Internet penetration figures which are restricted to people over the age of 14 and who are online for at least one hour a week. Other research institutions survey an albeit random sample of online users, while some count on the so-called "advanced Internet users" (users that respond to banner ads that are requesting their participation in a survey about the Internet). The Boston Consulting Group starts its estimates for e-commerce expenses from the supply side, IDC from the demand side, Forrester from the regulatory framework and the demand side. Another example would be that eMarketer's definition of an electronic commerce purchase of a product or service is one in which the buyer initiates and completes the entire purchase order, or contract via the Internet (including via e-mail). Forrester Research is including EDI transactions as part of their projections. Other researchers will often include revenues, which are "facilitated" or "influenced" by the Internet – such as a person researching merchandise online, but then makes the final order through a telephone call, salesperson visit or other non-digital means. Actually most of the reasons stem from **different definitions** or basic conditions.

Last but not least, the **unprecedented dynamics**, unleashed by this high-speed-evolution is making it extremely hard to give accurate estimates even for the most experienced experts. IDC for example had to review their estimates on Latin America recently, due to the unexpected

development. Their former estimate of 19.9 million people connected in the region in 2003 had to be revised to 30 million, and was just recently adjusted to even 42 million. In many cases this is closely related to euphoria or enthusiasm. The way Latin America embraced the Internet surprised many specialists. Also fast technological development and the unpredictable path of the creative destruction are contributing to this uncertain future. Only a couple of years ago, it has not been as obvious to many people that the advent of the mobile Internet (third generation; see Chapter: II.2 and IV.8), with its entire far-reaching signification, will have such a great impact on the digital landscape. In very few years we will be confronted with measurements problems like, if a connected refrigerator will count as an access point to the network of networks, or how many user to count for a connected car, etc..

Uncertainty and unprecedented speed of development led to this stage, where it became obvious that we already left the Industrial Age on our way to the Information Society, but still do not have scientific theories and potential explanations about how to deal with this heavy focus on information and knowledge. All we can perceive are tremendous and all-penetrating dynamics. Nevertheless, we need to stand up to them, in order to make the most of the progress, for development. The given paper is taking an inventory of the dynamics in Latin America, in order to draw some conclusions about what could be done, with regard to moderating, supporting and facilitating the region during its transition into the Digital Age.

II. E-fra-structure

> "...the "Global Information Infrastructure' is the raw material for electronic commerce... ." ("From Industrial Economics to Digital Economics: An Introduction to the transition." p.105)

As the "digital nervous system" (Gates, 1999) which is recently spanning the planet, the e-frastructure can be seen as the basic requirement of a digitized and networking world. Looking at the short term effect, a weak information infrastructure reduces the trade attractiveness of a much wider range of goods and services to a greater extent than, for example, a weak port infrastructure reduces the attractiveness of all merchandise trade with a country. The fact that information transmitting and communication is the basis of human conduct (and therefore for trade as well), it thus can act as a (if not the) bottleneck to development. Looking at the long-term effect, it is most reasonable that in the future all kind of economic activities will be facilitated by ICTs and therefore the introduction and incorporation of the tools is inevitable.

In this chapter the focus is set on the first Layer of Internet Economics, the Infrastructure Layer. It needs to be remembered that this Layer is a "traditional" industry (i.e. the Telecommunication Industry), rather than an all-penetrating and generic business tool (basing on the creation of knowledge or the exchange of information), like the second, third and forth Layer[12] (see Hilbert, 2001a).

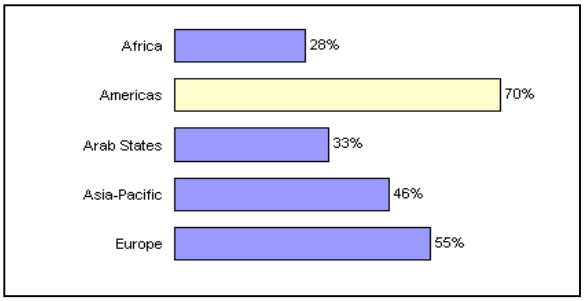
[12] In order to untangle the different aspects of modern ICTs and their effect on the economy, the schema of "the four Layers of Internet Economics" got introduced:
Layer One: The Infrastructure Layer; Layer Two: The Application Layer; Layer Three: The Intermediary Layer; Layer Four: The Commerce Layer (Hilbert, 2001a).

Nevertheless, there is a strong economic interactivity and dependency between the different Layers.

1. Reforms in the telecommunication industry

No other region has embraced the privatization of telecommunications as enthusiastically as Latin America. Of the 89 incumbent public telephone operators worldwide that had been privatized by the end of 1999, one quarter were found in the Americas region (ITU, 2000).

Figure 5
PERCENTAGES OF COUNTRIES THAT HAVE PRIVATIZED



Source: ITU, Americas Telecommunication Indicators, 2000

Chile was the first country in Latin America to sell its state-owned telecommunication company already in 1988. More than one decade later, in nearly every country in the region, the major telecommunication operator is either fully or largely-owned by private investors[13]. Nevertheless, the primary focus of privatization policies in the telecommunication sector of Latin America might --with the notable exception of Brazil-- not have been an increase in competition, but rather to maximize foreign direct investment and establish access to the international financial markets (Argentina) or to defend an important national operator (Mexico) (CEPAL, 2001). After all, in a decade of economic crises during the 1980s, the sales turned out to be most lucrative for the governments of the region, raising more than US$ 40 billion altogether (ITU, 2000). But simply selling the public telephone operator did not turn out to be a panacea. Privatization does not necessarily introduce competition. Performance targets set for monopoly providers, which are making use of the immense economics of scale in the fixed line telecommunication markets, and official long time concessions to the participating companies, went against all recommendations in favor of higher competition[14]. The state owned monopolies got replaced by private monopolies in many cases (CEPAL, 2001). After the early years following privatization, investment in the fixed-line network actually fell in many countries and main telephone lines distribution is still low (ITU, 2000). An often chosen solution has been the introduction of "regulated competition". However, regulatory agencies were often created at a late date, and therefore lacked the independence, resources, institutional powers and operational capacity that would have been needed (ECLAC, 2000). Ironically, when comparing heterogeneous experiences of the region's telecommunication sectors, it turns out that privatization itself has neither been necessary nor sufficient to increase the quantity of a country's fixed line network. Substantial relative network growth (doubling the number of fixed-lines during 1990 and 1999) has been seen in almost all the cases (Argentina,

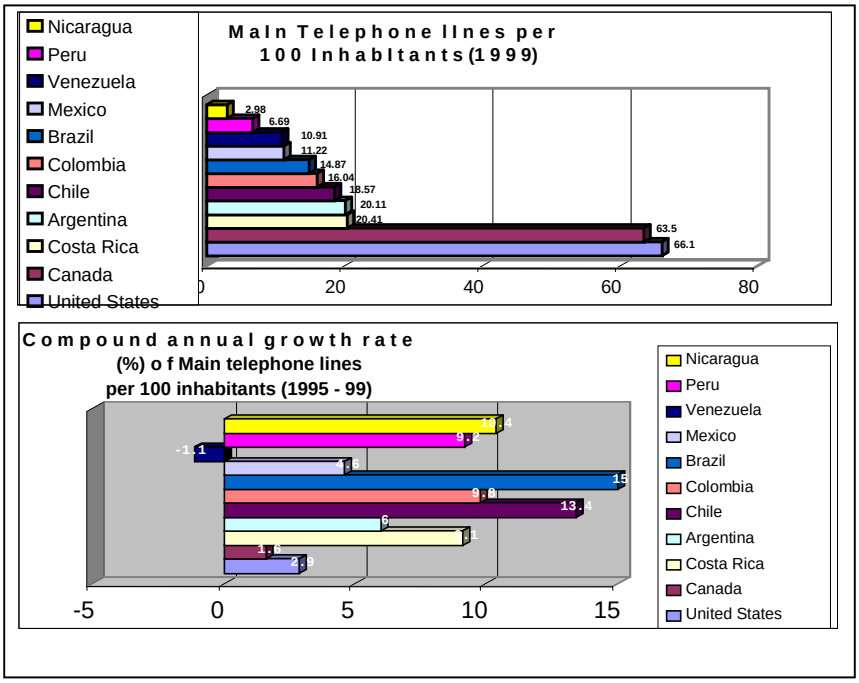
[13] Country and year of first transaction of telecommunication's privatization: Chile 1988, Belice 1988, Mexico 1990, Argentina 1990, Guyana 1991, Venezuela 1991, Perú 1994, Panama 1997, Brasil 1998, Guatemala 1998.

[14] Just to get a general feeling about the different markets: Pyramid Research (EIU) set Latin American's countries in the following order on their "competition scoreboard" (from highest (4.0) to lowest competition (1.0)): Chile(2.88), Colombia(2.61), Argentina(2,14), Brazil(2.03),Venezuela(1.79), Mexico(1.73), Peru(1.60)

privatization in 1990: 12 lines/100inhabintants (l/100i), 1997: 22 l/100I; Costa Rica (not privatized) 1990: 10.4 l/100i, 1997: 19.5 l/100i) (Katz J., 2000a). On the other hand, out of the consumer's perspective, privatization has often improved performance (shorter waiting lists, professional staff, better quality of service, etc.). The defects per 100 principal lines in Argentina, fell for example, from 42 in 1991 to just 17 in 1998 (ITU, 2000). But telecommunication costs stayed relatively high with the privatized monopoly. The debate continues in the telecommunications industry over the necessary level of regulatory intervention to enhance competition[15]. Bolivia, for example, recognizing that few countries have had success in opening the local market, established the rule whereby no operator can hold more than 40% of the local loop during the first four years of competition (gov.bo, 2001)[16]. In general, the Latin American experience has been very heterogeneous, but obviously the introduction of competition into the privatized market has brought better results from the consumers perspective, than switching from one monopoly to another (Katz J.,2000a). As another result, in some cases, the new telecommunication companies turned out to become the biggest private companies of their country (e.g.: Teléfonos de México (Telmex), Telecommunicaciones de Chile (CTC), Telefónica de Perú, Nacional Teléfonos de Venezuela (CANTV))[17] (Business Week, 1999).

Figure 6

MAIN TELEPHONELINE PENETRATION IS STILL LOW IN ALTIN AMERICA



Source: ITU, Americas Telecommunication Indicators, 2000

15 Latin American countries created 18 new regulatory agencies during the 1990s. This is representing the world's highest proportion of separate regulatory agencies (ITU, 2000).

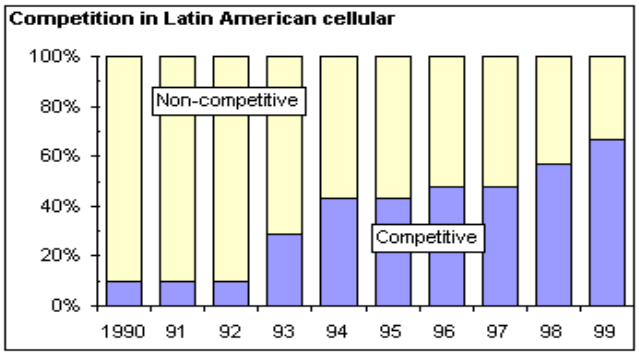
16 Bolivia is planning to open and liberalize their telecommunications market, scheduled to take place on 21.11.2001. The plan proposed by the Ministry of Economic Development and the Superintendency of Telecommunications was released almost one year prior to the actual liberalization of the market, which will give operators, investors and vendors ample time to prepare. The plan carefully outlines the rules that will take effect when deregulation occurs, setting dates and deadlines for each specific step that will lead to an open market (http://www.desarrollo.gov.bo/). Bolivia's actions stand in stark contrast to other markets, such as Venezuela, where regulators published rules for liberalization virtually at the same time the market was opening, creating confusion.

17 Classification based on market value, with respect to the other companies of the country.

By the end of the year 2000, fixed line teledensity in Latin America and the Caribbean topped around 15percent, giving the region more than 80 million fixed telephone lines, up from 60 million main lines and 12percent teledensity by the end of 1998 (ITU, 2000b)[18].

While in the basic service, over two thirds of the Latin American countries have been dominated by a monopolistic structure in the communication industry in 2000 (ITU, 2000), the trend with regard to new communication media is pointing into a much more competitive and dynamic direction. Many analysts expect that fixed-line networks will adapt the competitive market structures of Latin America's mobile market. Wireless markets are traditionally a great deal more competitive than fixed-line networks, due to their younger tradition (making it not dependent on using nets of existent operators (CEPAL, 2001)) and extreme economies of scale in the later mentioned. Wireless mobile techniques made it easier for new entrants to enter telecommunication markets successfully during the last decade. Like this the explosion of the regional cellular market and the competition of this market grew hand in hand. The chart shows percentage of countries in Latin America with choice of one (non-competitive) or more than one cellular operator (competitive).

Figure 7
L.A. MOBILE MARKETS BECOMING INCREASINGLY COMPETITIVE



Source: ITU, World Telecommunication Indicators Database, 2000

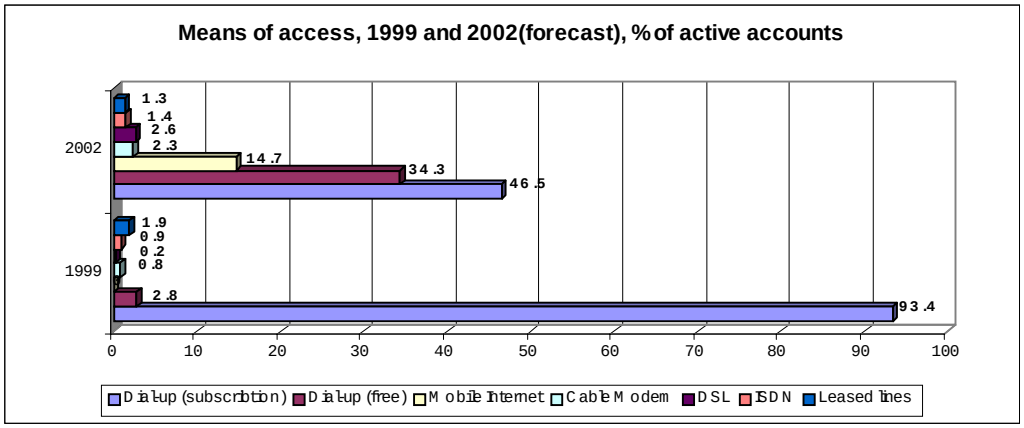
In general the Latin American telecommunications industry shows a rather low competition in the fixed line segment, "medium-competitiveness" in the mobile segment and great dynamics in the Internet segment (CEPAL, 2001). This order seems to follow some inheritance-logic and seems to get equilibrated as time progresses and the different segments interact.

[18] But numbers vary extremely between countries. Only about six percent of Bolivia's inhabitants have a fixed-line telephone. The figure is even glimmer when considering urban-rural disparities, as about 80percent of all lines in service are in the three largest cities of Bolivia.

2. Network access

In Latin America the traditional telephone line is still the most common way to get connected to the largest network:

Figure 8
THE WAY CHOSEN TO ACCESS IS EXPECTED TO CHANGE RAPIDLY IN LATIN AMERICA



Source: Pyramid Research; "E-Business in Latin America", 2000

But this is not the only way to get connected. This landscape is changing rapidly and could even change faster as suggested, for the benefit of the region. The so-called "convergence of ICT" (what Gartner calls the "Supranet"[19] (Gartner, 2001)) is coming up with various alternatives to connect to the heart of the Knowledge Society:

2.1 Bandwidth[20]

In order to keep the proportions, it is essential to review some magnitudes concerning transmission speed. A normal dial-up connection with a commonly used modem is counted for about 56 kbit/s. As an ISDN (Integrated Services Digital Network) connection it is claimed to provide a transmission of 64 kbit/s. We can talk about "broadband" (la banda ancha) if the transmission speed exceeds 256 kbit/s. This gives the user the possibility to download greater files, and to consume digital goods like music or videos "on demand". DSL (Digital Subscriber Line), which is especially in Europe becoming the new standard, is enabling data transfers from 192 kbit/s up to 2,3 Mbit/s, depending on the needs of the end-user. The "broadband-issue" is always a decisive part of the discussion, since "broadband means content". Information and Communication are not only based on language, and especially not only on the written form of language. Broadband enriches communication with sounds, moves, "flashs", images and the like, and therefore enables a better way of transmitting information and a more profound way of communication. With 44percent of Internet users dialing up through 33.6 kbit/s or slower modems in Brazil (eMarketer, 2000), sophisticated e-commerce sites (that are image-rich, contain substantial content and

[19] "The key to the Supranet lies in linking the variety of communication networks – voice and data, television and computer – that have been independent networks. This task is more than a networking issue. User interactions spanning these networks will be multimodal, involving many devices that interact in many ways." (Gartner, 2001)

[20] Bandwidth, measured in terms of bits per second, determines the speed at which data can flow through the computer and communications systems without interference. A bit (binary digit) is the smallest indivisible unit of digital information- either a one or a zero. One byte = 8 bits. Kbps=kilobites per second=1000bps; mbps=megabits per second=1,000,000bps; gbps=gigabites per second=1,000,000,000 bps.

therefore enable the e-commerce shopping experience) are virtually unusable by a large portion of the Internet population.

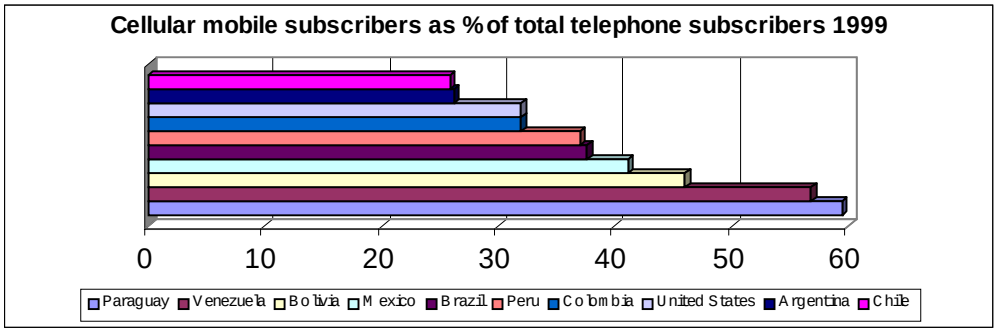
Forecasts for Latin America's broadband market, predict growth which is mainly driven by the business sector (small and medium size enterprises, SMEs), while the private sector is expected to continue using dial-up connections for the near future (Jupiter and Pyramid, for 2002: 5percent broadband; half cable modem, half DSL). There is a kind of regional divide expected concerning the speed of adoption to broadband. While countries like Argentina or Chile have a pretty good cable network (as one broadband alternative), the rest of the region will have to make some extra investments, in order to reach the critical mass that allows sufficient economies of scale to reduce broadband access costs. MSDW and Infoamericas give DSL techniques the biggest chance in the region to succeed in the three years to come (DSL: 44%; Dedicated (T1): 28%; Wireless: 14%; Cable: 14%) (infoamericas, 2001b).

2.2 Mobile

Mobile Internet access and the upcoming m-commerce (mobile-commerce, Chapter IV.8) can surly be seen as the talk of town at this stage of development. Mobile Communication Technologies are playing a very crucial role, especially in Latin America's market. A combination of private ownership, increasing competition and lack of fixed-line network has placed mobile markets in Latin America amongst the fastest growing in the world. Up from just 100,000 subscribers in 1990, and 3.5 million in 1995, the number of mobile cellular subscribers in Latin America soared to over 39 million in 1999 (ITU, 2000)[21]. This trend is expected to continue. Yankee Group estimates that the number of mobile phone users in Brazil only, will rise from 15 million in 1999 to 34 million in 2002, to reach 48 million in 2005. Paraguay, Venezuela and recently Mexico and Chile have become the first countries in the region, where mobile phone users outnumber those who depend on a fixed-line connection and most other Latin American countries are expected to cross the 50percent rate in the nearest future[22].

Figure 9

MOBILE PHONE IS BECOMING THE MOST WIDESPREADED ICT IN LATIN AMERICA



Source: ITU 2000

[21] Comparing this eleven-folded boom with the fact that the number of subscribers in the USA and Canada "only" doubled from 36 million at the end of 1995 to 74 million by the end of 1998.

[22] In 1998 the fixed-line telephone penetration per household has been: North America: 95percent; Central America: 33percent; Caribbic: 34percent; South America: 40percent (ITU, 2000)

Looking at this impressive dynamics, several most agencies are predicting that the number of people using mobile devices in Latin America to access the Internet will surpass those using PCs, around 2005[23].

So how far is the development of the mobile Internet access?

First of all essential to point out that the majority of cell phones in Latin America are still analogue (the so-called first generation). The first step of the convergence is based on the digitized **second generation** (2G), generally known through the applications SMS (Short Message Service) or WAP (Wireless Application Protocol), which offer a flexible way to deliver Internet content over wireless, digital networks. WAP is a rather simple, but open protocol, which is providing a standard for the provision of plain text- and simplest graphical information for mobile end-user devices. Due to its simplicity, the slow connection (less than 10kbit/s in plain 2G) and some problems WAP is having on its transmission technique, (which are not in accordance with several digital signature laws), the application widely failed until now, making it rather a branded technology- not a service. SMS however, is enjoying increasing popularity among Latin American mobile subscribers[24]. The technological 2G infrastructure is very heterogeneous in Latin America. At the end of 2000 41.36million GSM subscribers (European favored alternative) have been found in the region, 28.8million TDMA subscriber, 11.64million cdmaOne subscriber (North American favored alternative). TDMA and GSM are expected to merge into GPRS (General Packet Radio Services). This is a new Internet-oriented standard, which will boost data transmission speed over GSM to 171 kbit/s (max). EDGE (Enhanced Data rates for GSM Evolution) could then be introduced over GPRS networks offering high-speed data rates of up to 473 kbit/s. GPRS and EDGE are known as 2.5G (2.5 generation).

But they are only the first steps towards mobile multimedia, which will come with **Third generation** networks (3G). Third Generation standards was made possible by the groundbreaking work of the International Telecommunications Union (ITU) through IMT-2000 (see http://www.itu.int/imt/). IMT2000 is aiming at reaching a worldwide international standard, in order to allow globally available, mobile Internet access. An ultimate worldwide consent on standards is not found yet, since IMT 2000 describes three different 3G alternatives (WCDMA, UWC-136, cdma2000). 3G will also bring the important “always on” aspect. Contrary to being obliged to “dial-up” every time you want to network in the Net, being continuously connected to the network, evokes a totally different attitude towards its use (see Chapter IV.8). WCDMA (UMTS) is becoming the standard in Europe and Asia and was initially expected to boost data bit rates to up to 2 Mbit/s, yet technical implementation problems lately forced companies to correct the number down to less then 400 kbit/s, for the first days of 3G. The introduction of “Multimedia Concept Phones” is then expected to enable wireless downloading of music files or to consult the Internet by the means of a high-solution touch screen. NTT DoCoMo is planing to introduce 3G mobiles to the Japanese market during this year. In Europe mass market entry is expected around 2002/2003, depending on how the European telecommunication sector is handling its actual debts (which are the result of 3G-spectrum license auctioning). Generally speaking, the provision of equipment is the bottleneck of migration to 3G until now. Technology is not yet small enough, and batteries too weak in order to introduce them to the mass market. Generally speaking Latin America did not yet decide on which standard they do want to migrate to 3G. This is majorly stemming from the uncertainty of development in the United States. The U.S. cannot use the

[23] At the end of 2000, about 5 percent of Latin American households owned computers, while 12 percent of individuals in the region owned mobile phones. The gulf will widen by 2005, with just 13 percent of Latin American households owning personal computers but 39 percent of the population owning mobile phones, whereas it is predicted that most of them will be Internet-capable (Jupiter, 2001).

[24] Worldwide SMS experienced an explosion from 3billion messages per month at the beginning of 2000, to 15billion messages per month at the end of this year.

European/Asian band for 3G in the years to come (U.S. Department of Commerce, 2001). This and the U.S. approach of letting the market determine which standards succeed (in contrary to the rest of the world that is rather seeing standards as a way to create markets) put many countries in Latin America into a "wait and see" situation. The basic question here is about **economies of scale** in technology and equipment manufacturing. Without massive economies of scale in technology, Latin American countries will not be able to survive or even to enter the "3G-life-style-revolution". The technology pluralism in Latin America's 2G, is making it difficult to draw a general conclusion on which will be the prevailing 3G standard in the region. Due to favorable spectrum allocations, Venezuela and Brazil seem to go for the European/Asian alternative, while the rest of the region is observing U.S. development very closely and is trying to keep themselves all doors open. Interestingly enough, it is expected that especially Asia (and also Europe) will play the leading role in the upcoming "mobile revolution", as North America is expected to start late and fall even more behind (Chapter IV.8). Latin governments are preparing for the licensing of the demanded 3G spectrum (in Venezuela for example it is planned for the beginning of 2002, in Chile for the end of 2002). Auctioning these spectrum licenses collected almost 100DM billion for the German Finance Ministry in August 2000, for example (around US$ 46billion at this time (more than all telecom privatization in Latin America together)). Nevertheless, due to the smaller and weaker markets in Latin America and in order to push the fast introduction of these services, it is expected that the regional governments will choose the so-called "beauty-contest" approach, in which proposals from interested parties get evaluated and afterwards rewarded --using certain pre-determined criteria--, instead of auctioning the licenses.

The **Forth generation** is expected to be introduced around 2008/2010. 4G will unify many of the different wireless access possibilities (see following section), giving a very high-speed connection to the network in an entirely covered world.

2.3 Wireless

There are many other wireless alternatives to enter the global information highway. **Satellite** would be one of them. In favor of a satellite Internet connection, would be its overall extension (especially in order to reach rural or far-off areas, like mines, etc.) and its high transmission speed. But for private user in developing countries, this alternative would be financially not considerable (due to the necessity of the expensive dishes). Nevertheless Microsoft is planning, together with Teledesic to install their own satellites in space (28 Mbit/s). Another wireless possibility would be to bring the data to a base, and then just to bridge the "last (couple of) miles" wireless. These alternatives are often referred to as "fixed-wireless-broadband" (in contrast to "mobile-wireless"). Because of deficiencies in the wireline infrastructure in the region, demand for fixed wireless broadband is high (U.S. Department of Commerce, 2000). **WLL** (Wireless Local Loop), or **LMDS** (Local Multipoint Distribution Services) would provide the adequate infrastructure. Here the restriction of speed is mostly set by the technique used. In Latin America, many countries are licensing the WLL during this year, putting great expectations into the technology. The Yankee Group estimates that WLL lines in Brazil will account for 8percent of the country's total mainlines and 50percent of the region's WLL lines by 2003. **Sky Station** International has pioneered technology that utilizes a solar powered lighter-than-air platform held geostationary in the stratosphere to provide high capacity wireless telecommunications services, planned majorly to provide large metropolitan regions. Sky Station International claims that ultimately there will be at least 250 Sky Station platforms, one about 21 km (70,000 feet) above every major city in the world. The technique used is called "Stratospheric Telecommunications Service", which will commence with the first Sky Station platform (in shape similar to a zeppelin, in size bigger than a football field) deployment in 2002. After this, Sky Station platforms will be implemented in accordance with user demand as expressed by responsible organizations in each country. Sky Stations provide

a 2 Mbit/s- 10 Mbit/s broadband service and are not expected to be too expensive, due to the fact that it is not required to set up as many terrestrial radiobases (www.skystation.com). Wireless **LAN** and **Bluetooth** are mainly indoor solution, enabling the "wireless, mobile office", for example. Like this laptops or the like, can be connected no matter where in the office building one might be (up to 20Mbit/s). But also hotels and airports get connected already.

The future will be a mix of wireless systems, and a seamless roaming between them, automatically switching to the connection which is giving the end-user the best transmission rate.

2.4 Television

Another way of accessing the "net-of-nets" would be through the TV-cable (in most of the cases around 300-400 kbit/s provided). Cable-modems reach impressive transmission speeds (when coupled with glass fiber-cables up to 40 Mbit/s). It is expected that the market for Internet access by a cable modem will increase manifold in the years to come –starting from less than 100,000 in 1999 (Multichannel News International, 2000). Especially in Argentina, where the Cable TV penetration is extraordinarily high (over 60 percent, in comparison to around 20percent in Brazil), cable-modems should provide an adequate alternative. This alternative enables users to connect to the Internet at a cost that is around the same as the cost of cable television service. Also the "dial-up barrier" gets eliminated, enabling the "always on experience".

TV penetration throughout the South American homes lies by around 83 percent and in Central America by about 77 percent (ITU, 2000), while PC penetration is ranging from a low of 3 percent in Peru to a high of 10 percent in Argentina (ecommercetimes.com, 2001). In the long run, the television itself should become the best-equipped short-term solution for the private front-end problem. Focusing on entering the Internet through television, two principal categories can be differentiated: One is digital television; and the other one to "up-tune" a traditional TV-set through a "set-top box", a video game console (like Playstation2) or the like. The second alternative is basically making use of the fact that a television does have a screen, connecting the user to the "traditional Internet". Set-top boxes for a TV are a lot cheaper than a PCs. However this solution might be more relevant for the private sector and not to connect the business world. Some ISP are already providing access for Internet set-top equipped TVs. Here the tremendous forces of the "convergence of ICT" become evident. The introduction of digital TV will introduce a new form of Internet (Chapter IV.9). Nevertheless, the implementation of digital television is still fighting with differences in standards on an international level, and Latin America finds itself once again in the middle of an European-U.S.-Japanese "standard war" (U.S.'s ATSC, European DVB, Japanese ISDB-T, whereas the European DVB is hardly considered anymore for Latin America). Even though there are no official decisions made yet, many Latin American countries are expecting to be able to introduce digital television until 2003/ 2004[25].

2.5 Powerline

Powerline solutions provide Internet access through every electricity outlet. Given the wide-spread electricity net in Latin America, this alternative seems like a big opportunity for the countries of the region. Up- and downloads are expected to be around 1 Mbit/s, but depend on the number of users online. Several transnational companies that are working on the technology announced their interest in entering the Latin American market. For example the purchase of the Chilean mobile operator SmartCom by the Spanish electricity company Endesa España has by

[25] A big boom in the television industry is expected here (from 2003 onward…).

many been interpreted as a step into the powerline direction[26] (CEPAL, 2001). Unfortunately end-user devices are not market ready yet, but expected to be presented during 2001.

Bottom-line is that the access to the network of networks is by far not restricted to a telephone line and a computer. Actually, Latin America's existing e-frastructure and its economic characteristics disfavor this traditional access alternative, setting the focus on technological e-novations, like television set-up devices, digital television or 3G. Second conclusion would be that the roll-out of a network and national coverage, is not anymore seen as a major problem. The region might only have a 15percent fixed telephone line penetration, but in contrary to what many assume, the by far largest part of the Latin American population is already "covered" (means reachable) through a digital network (2G mobile telecommunication[27]). Also powerline could prove as a useful alternative to gain some ground. The focus is shifting to the end-user access problem, means the provision of cheap ICT equipment.

3. Internet Service Provider

ISP (Internet Service Provider) is used as a generic term to describe companies and organizations that provide Internet access to others. Internet access services in the region generated revenues of $1.79bn in 2000, up from $57m in 1995 (EIU.com). Traditionally ISPs seek revenues from subscription fees, interconnection revenue from call-charge sharing, advertising and e-commerce. Revenues from e-commerce are small so far but are growing fast. Terra Networks reported total commission revenues of US$3.3m in the first half of 2000, stating that this implied a five-fold increase in six months[28]. There is an interesting and important business model concerning the combination of ISPs and Portals (see Chapter IV.2). Besides often being Portals themselves, ISPs do often go deeper, from the first into the third layer of Internet Economics (see Hilbert, 2001a), as --for example-- Terra bought Lycos Inc.[29] for US$12.5 billion, last year, marking the most extensive combination of a first and third Layer company. Interesting dynamics are expected here, as 3G or digital television is getting introduced[30].

The vast majority of Latin American Internet users still pay standard local call prices to access their ISP. The composition of the total price for Internet access (usually a combination of public switched telecommunication networks (PSTNs) prices and ISP costs) has been shifted extremely towards lower ISP expenses for the customer[31]. Large ISP charges in Latin America for connecting to the Internet via an analogue modem is rapidly becoming a thing of the past. This may be partly due to the advent of **free Internet service providers**. Traditional ISP, like UOL *(market leader Brazil),* Starmedia *(US based),* TerraLycos *(Telefonica subsidiary; market leader Chile, Peru, Guatemala),* Ciudad Internet *(Argentina),* IFX's Tutopia *(US based),* Telmex's Prodigy *(market leader Mexico),* AOL Latin America, etc. got recently challenged by the arrive of free Internet access service companies to Latin America. The free Internet access paradigm was pioneered by Freeserve (UK) in September 1998 and adopted by the Bradesco Bank (one of Brazil's largest commercial financial institutions) in early 2000, as the bank decided that offering

[26] In June 2000 the Spanish company purchased the Chilean operator for US$300 million, as part of its international strategy to introduce telecommunications into its electricity market focus.

[27] Transmission speed might be low until now (10 kbit/s), but we know experience has been showing us that **bandwidth is doubling at least every six months**… .

[28] Terra Networks and El Sitio have developed co-branded auction sites with DeRemate and Lokau, respectively. Starmedia and UOL, through alliances with Visa International, are moving into the security aspects of e-commerce. Mexico's Todito has set up an impressive string of alliances to facilitate offline payment. Brazil's iG has started direct sales of flowers and pizza through its site; ElSitio has gone a step further by acquiring DeCompras, a Mexican e-tailer. (EIU.com)

[29] Lycos Inc. is the fourth biggest Internet Portal in the United States and with strong presence in Europe (Germany, UK, France).

[30] Once Internet access is getting extended from fixed line to wireless devices, other and additional telecommunication infrastructure players will enter the Internet market, creating new dynamics between the four different Layers of Internet Economics.

[31] In OECD countries for example ISP cost make up only around 20 percent of the final costs nowadays (OECD, 2000).

free access to their clients would encourage them towards Internet banking. The cost of offering the service would be offset by lower transaction costs and fees from account-management services. The strong response from the banks' customers was enough to persuade others in the region, that a public free-access service was viable (such as BRFree (Brazil), iG (Brazil), iCero (Argentina), Banco Comercial (Uruguay), TerraLivre (Terra), Gratis1 (Starmedia), Netgratuita (UOL) and even the Catholic Church). There are several different business models underpinning 'free ISPs'. One would be the reallocation of costs (see Bradesco Bank), another one would be shared call-charges, or advertising. These models tend to share certain characteristics. A common element, is a reduced expense for customer management and support.

Reliable data on free access are hard to find, but initial growth was clearly explosive. UOL's free ISP (which actually folded late in 2000), and iG (InternetGratis) claimed to register 830,000 and 420,000 users, respectively, in their first two weeks and 3million and 2million users apiece after five month. Outside Brazil the impact was less dramatic, but free-access model had reached all the major markets by the middle of 2000. TerraLivre recorded 100,000 users in its first 25 days in Mexico. In Argentina free providers had taken one-quarter of the market by the middle of 2000.

Following the initial boom, the natural selection already claimed the first casualties. This is partly due to that, in some countries telecommunication regulators do not compel local telephone companies to share connection charges with ISPs, eliminating one lucrative income alternative for free ISPs. Industry specialists estimate that it costs US$ 7-8 per subscriber and month to offer a reasonable dial-up access service (EIU, 2000a). If the provider has sufficient economies of scale, the figure is at the lower end of the range. Until now there is not enough of the advertising- and e-commerce pie to feed all free ISP initiatives. Super11 (Brazil) failed to attract fresh capital and was forced to abandon its 800,000 registered users to iG. UOL's Netgratuita and Starmedia's Gratis1 cut services, while IFX's Tutopia began charging for access in January 2001.

Nevertheless, the shrinking number of free ISPs is not expected to have a substantial impact on the number of Internet users in the region. First, the practice shows that the remaining players in the free ISP marketplace will absorb the subscribers of the failed services. Usually, clients of free ISP services are from lower classes and here the cost factor is the most decisive. Second, for the middle- to upper-class people who make, and will make up the majority of Latin American Internet user population, paying the monthly cost of an ISP represents a minor additional burden, which they are willing to pay for a better service.[32]

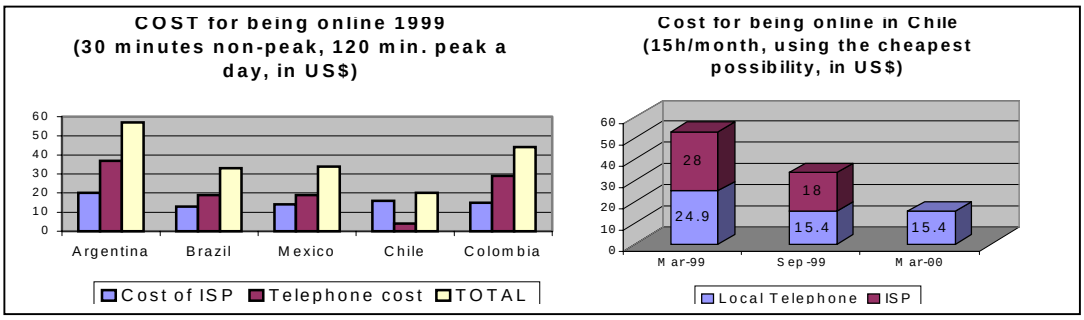
The often misinterpreted catchword "Internet gratis", of course does not free from charges for telephone-, cable-, satellite- etc access. But also prices for the commonly used dial-up Internet access are dropping dramatically in most of Latin American countries[33].

[32] A survey by Ibope in February 2000 claims for example that fee-charging ISPs did not loose too many subscribers with the appearance of the free service. What the Ibope results suggest is that free access has brought online people who were not users because of the high access cost. The number of users belonging to the C income group in Brazil has risen from 10.6percent in December 1999 to 16percent in February 2000.

[33] The BCG estimates that overall costs of accessing the Internet (including communications charges) have fallen in 1999 on average by 23percent in Argentina, 20percent in Brazil and 8percent in Mexico.

Figure 10

ACCESS COST VARY HIGHLY BETWEEN COUNTRIES BUT ARE GENERALLY FALLING



Source: Telenexo, 2000; CCS 2000

Interesting to point out the low average access cost in Chile. This is mainly credited to high competition in and between the many different access alternatives available.

Considering the "convergence of ICT"(i.e. the upcoming introduction of 3G and digital television), great dynamics are expected in the ISP-sector.

4. Conclusions ICT infrastructure

Micro-level introduced technical progress and marco-level introduced privatization have been the two coining factors in the region over the last decade. Investments into the telecommunication sector have been immense and the demand for the service is still highly unsatisfied[34]. The level of competition is disparate in the industry: rather low in fixed-line, medium in mobile, and high in Internet. Traditionally it has been distinguished by two different challenges:

One of them is to increase the availability of telephone service. Traditional telecommunication (voice transmission) is still the driving force in the transition to the information- or network society, and will continue to be for the near future[35]. While the region has made major strides in this area, there is still considerable work to be done. The other issue dealt with is, to provide access to what is known as the Internet (through Cable TV, Powerline…). Nevertheless it becomes already obvious how these two ways of exchanging information melt down to merge in the network of networks. VoIP (Voice over Internet Protocol) is developing rapidly, and even though it is until now far from perfection, it is already being used, especially in poor countries, due to its low cost. But in the near future, talking, reading, hearing, writing and even seeing will merge, once technical difficulties are overcome, unleashing the tremendous power of the networked society. A frequent prediction is that there will be more mobile devices accessing the Internet than PCs by 2004/2005. Few people disagree with this proposition. Nevertheless there is an important distinction to be made here between broadband mobile access, mobile access in a local area network, and mobile devices in the wide area network. Mobile Internet will certainly

[34] "The region represents an excellent telecoms investment opportunity, with huge unmet demand for telecoms services and a regulatory regime in place in many countries that now favours investment as well as competition in some if not all sectors, thus driving down costs of services to consumers and improving access. … Telecoms operators in Latin America and the Caribbean invested more than US$ 50 billion in their networks in the four years to 1998. Telecoms revenues were up to 59percent during the period, from US$ 29billion in 1995 to 46 billion in 1998." (ITU, 2000b)

[35] According to UWCC (Universal Wireless Communications Consortium) Latin America is the market with the highest potential for TDMA (Time Division Multiple Access, which is a second Generation standard (like GSM)), showing us how the 2G still will continue to be important in the region. On the other hand, there is the example of Venezuela, which decided not to get itself involved too deeply into the 2G and will rather focuses on leapfrogging directly into the 3G (which is bringing certain benefits and challenges).

replace some high-speed access, but will not be a complete substitute for fixed line Internet access, in the near future. The difference between the two will be decisive, and will be dominated by different business models.

Pricing will continue to be a determining factor in telecommunications development, however. Generally speaking, there is evidence that competition and pluralism in access alternatives is significantly lowering prices (as in Chile). The rapid increase in the number of people able to access telecommunications services in the region will depend on governments and regulators adopting policies that encourage carriers to make services affordable for the masses and not just the privileged few. Countries in the region should carefully consider the costs and benefits of existing telecommunications tariffs for Internet dial-up connections. In most countries, end-users are forced to pay the time they are connected per-minute. Evidence collected by the ITU, the OECD and other organizations demonstrates beyond any doubt, that per-minute tariffs have had a direct and significantly negative impact on Internet usage around the world, whereas the handful of countries with flat rate tariffs for local telephone have witnessed explosive growth in Internet use[36]. Flat rate charging for local calls, special reduced tariffs for Internet dial-ups, reduced rates for second lines to the home and other innovative charging schemes could go a long way in stimulating Internet use and the development of creative applications in business and non-commercial settings. Focusing on the long run, technological development (like VoIP) can be very useful (i.e. cheap) innovations for developing countries.

Beyond what can be achieved through telecommunications reform, special measures are required to accelerate the national and regional deployment of Internet infrastructure and services. For example, every region in the developing world lacks adequate bandwidth to optimally manage the routing of Internet traffic and grow network-based businesses and relationships. The net effect of this situation is that more than 90% of all traffic originates, terminates or transits in the United States (G8, 2000). This in turn decreases local network performance, resulting in the infamous "World Wide Wait", and deters the flourishing of business and non-commercial usage. Looking at the numbers of routers and response time in the region visualizes the problem:

Table 1

RESTRICTED NETWORK CAPACITY IN LATIN AMERICA

	Routers	Response Time (in milliseconds)
South America	5	508
Asia	9	415
Australia	9	410
Europe	16	188
North America	24	137

Source: InternetTrafficReport.com/index.html (based on the 60 days prior to 16.03.2001)

Latin American countries urgently need to build out network capacity in order to realize the digital opportunities. This is underlining one of the most urgent issues concerning e-frastructure policies: regional and international cooperation and adjustment.

[36] European internet usage surged between June 2000 and February 2001 after companies started offering flat rates that covered both internet access and usage of phone lines. A Jupiter MMXI report found that the monthly time 'net users spent online at home in Germany increased by 226% to 13 hours, the most in Europe. Runners up included Spain and Norway (averaging 9 hours monthly), Italy and Denmark (about 8 hours) and Britain and France (7 hours).

III. Digital Divide

> "Visions about a global, knowledge-based New Economy and universal electronic commerce are hard to implement in a world where as much as half of its inhabitants have never made a telephone call, where a city like New York has more telephones than all of rural Asia or where you can find more Internet accounts in a town like London than in all of Africa." ("From Industrial Economics to Digital Economics: An Introduction to the transition." p.105)

1. Worldwide

There is much justifiable concern about the "digital divide", which can generally be seen as the gap between the "information-rich" and the "information-poor". Almost seven percent of the world's population has already been connected to the heart of the networked society in 2000 (expected 1.2billion in 2005, 3billion (= almost half of nowadays world's population) in 2010), whereas in some Northern Europe countries or in the U.S. two thirds of the population is networking in cyberspace already, in contrast to only 4percent in Latin America (Nua, 2001). In the preceded paper the two general theories of the digital divide have been discussed: the "big divider" vs. the "big equalizer" (Hilbert, 2001a). The worldwide academic discussion about these two theories let to the question if the digital divide should actually be called like it is, or if it rather should be renamed with "digital opportunity", in order to underline the tremendous chances this high-speed-evolution is bringing with it (G8, 2000).

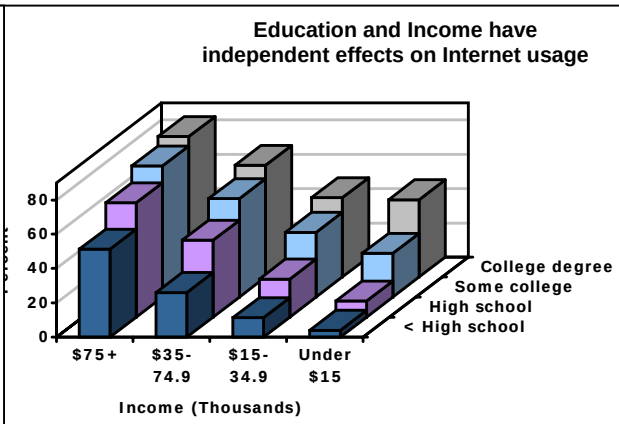
The digital divide can be measured in different dimensions. There is the divide between regions with different degree of develop-

ment, the divide between different countries, the divide inside regions and the divide inside a country. The divide can be looked upon in demographical dimensions, in locally geographical dimensions, in socio-economic dimensions and so forth.

Figure 11

PROFOUND RESEARCH ABOUT THE DIGITAL DIVIDE IN U.S.

Some characteristics of the divide might seem obvious, like that income and education are strongly positively related to Internet usage. Interesting, nevertheless to see (from detailed studies made in some developed countries -- especially in the United States, where the careful observation of the national digital divide is reaching its fifths year already) how income and education do have independent effects on Internet usage:



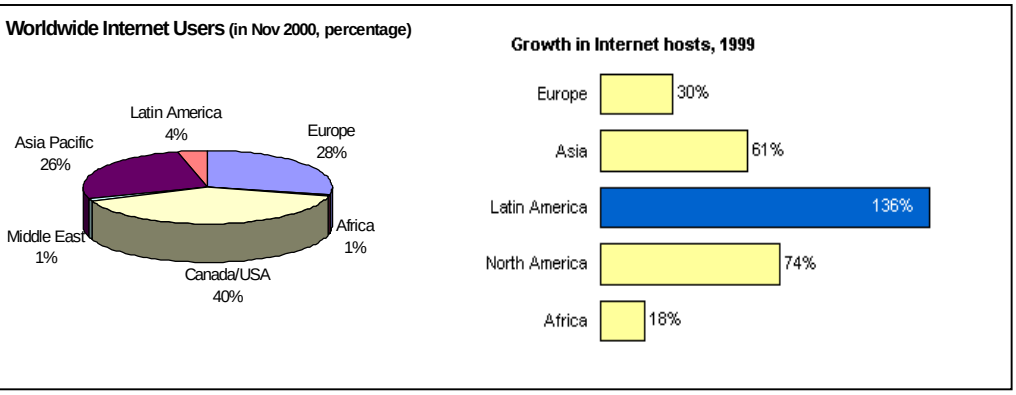
Source: U.S.Department of Commerce, 2001; "Falling through the net IV: towards digital inclusion"; www.esa.doc.gov

1.1 General Divide

In this chapter we will have a closer look on different aspects of the divide. There are different dimensions, provoking different challenges and chances. It is essential to focus on the entire spectrum in order to understand the origin of the divide and the signification for the region, in order to be able to draw valid conclusions. Today's **Internet access** is surely one of the key parts. Latin America lags behind the developed world in terms of connectivity, but the region is the fastest growing Internet community in the world[37].

Figure 12

LATIN AMERICA ENTERS THE CYBERSPACE AT AN IMPRESSIVE SPEED



Source: Nua Internet Surveys, 2001; Internet Software Consortium (www.isc.org)

[37] Packard Bell reports that in December 1999, there were some 700,000 Chileans with Internet access, which increased to two million in September last year. On average that is making for more than 4000 Chileans who are connecting to the Internet everyday for the first time. This represents 167 new users per hour!

Even though numbers of course differ (see Chapter I.3), there is a broad consent about the continuation of this positive trend. Jupiter predicts that the number of users in the region will grow at an annual compound rate of 36percent between 1999 and 2005. That compares with a rate of 30percent for Asia, 18percent for Western Europe and 11percent for North America. Like this the region is claiming for a bigger and bigger piece of the global Internet-pie at an impressive speed. While in September 1999 Latin America only accounted for 2.6percent of worldwide Internet user, it claims for twice as much in early 2001 (Nua, 2001).

As the number of Latin Americans who are passively entering cyberspace is growing rapidly, necessary to take a look at their active participation as well. Around 10.5percent of the world population is native English speaking, 6.25percent Spanish and 3.17percent speaks Portuguese (Funredes, 2000). According to a recent study of Funredes (Fundación Redes y Desarrollo) Latin countries won substantial ground during the last two years, with regard to the dominating English **language** in cyberspace, with Spanish and Portuguese being the fastest growing. Nevertheless Latin content still seems underrepresented in cyberspace compared with real world proportions.

Table 2

LATIN LANGUAGES REPRESENT A SMALL SHARE AND ARE NATURALLY GROWING FAST

Language	Real World Share %	1998 cyberspace %	2000 cyberspace %	1998-2000 growth cyberspace %
English	10.5	75.0	60.0	-20
Spanish	6.25	2.35	4.85	+95
French	2.17	2.81	4.39	+55
Italian	1.0	1.50	2.77	+85
Portuguese	3.17	0.82	2.14	+162

Source: Funredes 2000, http://funredes.org/LC .

This is often getting misinterpreted as a lack of adequate content for non-English speaking Internet participants. Taking a more accurate approach, comparing the number of pages in a certain language with the number of people of a language group that is actively participating in cyberspace, proportions are relatively equally distributed.

Table 3

IN RELATIVE TERMS LATIN LANGUAGES ARE NOT AS EXTREMELY UNDERREPRESENTED

Language	Sites %	Online Surfers %	Sites/Surfers
English	60.0	49.6	1.21
Spanish	4.85	4.9	0.99
French	4.39	4.0	1.10
Italian	2.77	3.2	0.87
Portuguese	2.14	2.5	0.86

Source: Funredes 2000, http://funredes.org/LC .

Even though in Latin America (and all over the world) many sites are set up in English, the lead in this comparison to Latin language sites, is amazingly small, showing that the loudness of

voices of a specific language group in cyberspace, is growing parallel with the people who communicate through this language in the virtual world (i.e. demand is creating its content).

At this stage of development languages in general, are another key to the divide. A relatively high **illiteracy rate** --in especially in some small countries in the region like Haiti, Nicaragua, Honduras, Guatemala, El Salvador- but also in Brazil-- is a basic obstacle which is creating the divide. The major part of the data stored in cyberspace is until now in forms of written language, which is making it difficult for illiterates to directly participate. However this might become less of a problem as bandwidth increases. Very sophisticated applications are already developed, which are reading any kind of text out loud by simply marking it. Thinking a little bit further afield, we will confront the barrier of language pluralism. Ideas about the "global brain storming" (Hilbert, 2001a) are set on the assumption that the globalized world is speaking a globally unified language (or that highly advanced translation technologies exist). The fact that the majority if the information stored in cyberspace until now is in English (in absolute terms), set a kind of standard in cyberspace and many claim that English is and will continue to be the language of the globalized world (also due to the fact that it is the most common second language spoken). This enables English-capable user to profit more from taking part in the "global brainstorming"[38].

Evidence seems to suggest that there are many kinds of obstacles contributing to the digital divide. In order to be able to classify different countries according to their stage of development in this transition, more than just "Internet hosts per capita" has to be considered. Many groups have approached a measurement, which became known as "**E-readiness**"[39]. Of course, assessing the capacity of nations to participate in the networked economy is more an art, than a science. There are statistics abound, but they have to be viewed with skepticism. The parameters that get chosen often depend highly on the individual gusto or purpose[40]. Emphasis gets laid on the underlying infrastructure, on business or economic growth, on education, social benefits from ICTs and overall society inclusion, or government contributions. Two big scale and country-specific rankings attracted attention recently: one made by McConnell International (McConnell, 2000), in collaboration with WITSA, and another one from the Economist Intelligence Unit (EIU, 2000b).

In the "EIU's e-business-readiness rankings", 60 countries get examined and listed according to their ability to "reap the benefits from the new networked economy" (EIU, 2000b). The report weights two factors: the general business environment (which screens 70 different indicators covering criteria such as the strength of the economy, the outlook for political stability, the regulatory climate, taxation policies and openness to trade and investment; actually very similar to the "old economy"- business environment rankings), and "connectivity" (which takes into account not only the state of the existing telephone network but also other factors that affect Internet access, such as dial-up costs and literacy rates). The final result divides the world in three: the first third of the countries are already settled, and are very close to each other in the ranking; the next 20 or so

[38] Considering the long-term information and communication evolution, at the end, language itself is nothing more than a tool, enabling us to exchange information (which includes communication), just like all the other ICTs…

[39] One would be the measure of the Mosaic Group (the ITU is working with). It uses five dimensions: pervasivesness, geographic dispersion, sectoral Absorption, Connectivity Infrastructure, Organizational Infrastructure, Sophistication of Use (http://mosaic.unomaha.edu/gdi.html). The Sociedade da Informaçao no Brasil apapted an "IT Footprint" established on 8 indexes: PCs, telephone lines, electronic production, electronic consumption, graduates in technology, literacy rate, internet hosts, television sets (SocInfo, 2000). Also the World Bank is sponsoring a lot of them: For example, the private, non-profit High-Technology Advisory Foundation (CAATEC), created by economist Ricardo Monge in conjunction with the academic sector and the general managers of many of Costa Rica's high-tech multinationals, is working on an analytical system to gauge Costa Rica's "e-readiness" in four areas: infrastructure, regulations, institutions and human resources to provide an objective "report card" on Costa Rica's level of technical competence. See also: http://www.infodev.org/ereadiness/methodology.htm, and http://www.bridges.org/resources/ereadiness.html for further listing of initiatives.

[40] Another nice example of e-readiness comparison can be found under: http://www1.worldbank.org/gdln-scripts/programs/kam/kamscript.exe/show_page where you can select your own parameters, and will instantly get an e-readiness graph.

countries have the potential to catch up if they put the right policies in place, but there is much work to be done. The bottom third of the rankings risk being left behind.

Table 4
E-READINESS RANKING OF 60 COUNTRIES (EIU)

Rank	Country	Business Environment Ranking, 2000-04*	Connectivity rating **	E-business readiness ranking***
1	US	8.69	9	8.88
2	Sweden	8.26	9	8.6
3	Finland	8.26	9	8.6
4	Norway	8.00	9	8.6
13	Germany	8.32	8	8.1
20	Israel	7.61	8	7.7
21	Japan	7.43	8	7.7
23	**Chile**	7.85	7	7.4
26	Argentina	7.22	6	6.6
27	Taiwan	8.13	5	6.1
34	**Mexico**	6.78	5	5.9
35	Brazil	6.37	5	5.7
42	Venezuela	5.51	5	5.3
44	Russia	5.16	5	5.1
47	Peru	6.36	3	4.7
48	Colombia	6.13	3	4.6
50	India	5.97	3	4.5
51	China	5.88	3	4.4
53	**Ecuador**	5.32	3	4.2
60	Iraq	2.07	2	2.0

Source: www.ebusinessforum.com * From EIU Country Forecast, score out of 10: more than 8 = very good; 6.5-8 = good; 5.5-6.4 = moderate; 5-5.4 = poor; less than 5 = very poor.** From Pyramid Research, out of 10. *** Average of business-environment rating and connectivity rating, out of ten.

While Colombia only comes in 48th in this ranking, other statistics claim that the country has the 4th fastest growing ICT market of the world (1992-1999), and comes in 6th by worldwide rankings about ICT spending as percentage of GDP (WITSA, 2001). Rankings always depend very highly on the parameter setting.

The World Bank's InfoDev, on the other hand used in a recent paper numbers about "Spending on Information Infrastructure", "R&D as percentage of GDP" and the number of "technicians and scientists per 1million inhabitants", to visualize the worldwide divide (InfoDev, 2000a). Here Latin America ranks relatively high:

Table 5

E-READINESS RANKING REGIONS (INFODEV)

Region	Spending on II (US$ per capita)	R&D as % of GDP	Technicians	Scientists
OECD	129.11	1.8	1326.1	2649.1
Latin America & Caribbean	28.28	0.5	205.4	656.6
Eastern Europe & transition Economies	22.89	0.9	577.2	1841.3
Middle East	19.93	0.4	177.8	521.0
East Asia	13.49	0.8	235.8	1026.0
South Asia	13.49	0.8	59.5	161.0
Sub Saharan Africa	11.56	0.2	76.1	324.3

Source: Worldbank; InfoDev; www.infodev.org.

The McConnell report examines 42 "critical economies for their E-Readiness– their capacity to participate in the global digital economy" (McConnell, 2000). The ratings measure status and progress on five interrelated attributes: Connectivity, E-Leadership, Information Security, Human Capital, E-Business Climate. Countries get classified into three different groups: (1) indicates the majority of conditions are suitable to the conduct of e-business and e-government; (2) indicates improvement needed in the conditions necessary; (3) indicates substantial improvement is needed in the conditions necessary; (+) indicates improving relative to prior time periods.

Text box 1

E-READINESS RANKING PARAMETERS (MCCONNELL)

Connectivity- Are networks easy and affordable to access and to use?

@ Availability of wireline and wireless communication services, community access centers (free and paid), and networked computers in business, schools, and homes.
@ Affordable and reliability of network access, including the cost of service, downtime, and the prevalence of sharing access among individuals.
@ Reliability of electronical supply for business-critical computer operations; and ease of importing and exporting goods of transporting them within a country.

E-Leadership- Is E-Readiness a national priority?

@ Priority given by government to promoting the development of an e-society on a national level.
@ Extent of demonstrated progress on e-government, including efforts to automate governmental processes.
@ Quality of partnerships between industry leaders and government to improve E-Readiness.
@ Level of effort to promote access for all citizens.

Information Security- Can the processing and storage of networked information be trusted?

@ Strength of legal protections and progress in protecting intellectual property rights, especially software.
@ Extent of efforts to protect privacy.
@ Strength and effectiveness pf the legal framework to address and prosecute computer crimes, authorize digital signatures, and enable public key infrastructures.

Human Capital- Are the right people available to support e-business and to build a knowledge-based society?

@ Quality of and participation levels in the education system, with an emphasis on efforts to create and support a knowledge-based society.
@ Culture of local creativity and information sharing within society.
@ Skills and efficiency of the workforce.

E-Business Climate- How easy is it to do e-business today?

@Existence of effective competition among communication and information service providers.
@Transparency and predictability of regulatory implementation, openness of government, rule of law, and general business risk (Political stability, financial soundness).
@ Openness to financial and personal participation by foreign investors in ICT businesses.
@ Ability of the financial system to support electronic transactions.

Source: McConnell International, 2000; http//www.mcconnellinternational.com .

Table 6
E-READINESS RANKING 42 COUNTIES (MCCONNELL)

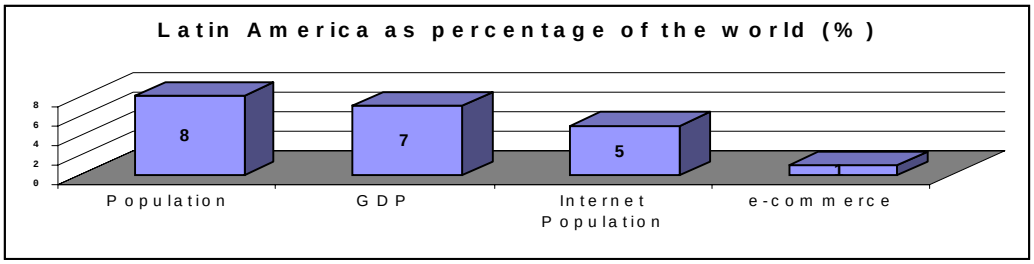
	Connectivity	E-Leadership	Information Security	Human Capital	E-Business Climate
Costa Rica	2	2+	3+	1	1
Chile	2+	2	2+	2	2+
Argentina	2+	2	2	2	2+
Mexico	3+	2	2+	2	2
Brazil	2	2+	2	2	3+
Peru	3+	2+	2	3	2
Venezuela	3+	3+	3+	2	3+
Ecuador	3+	3	3	3	3+

Source: McConnell International, 2000.

Here, in comparison with the rest of the world, the Latin American region still lacks assurance of information security (especially software piracy), low connectivity (especially the high inequality between social classes) and the lack of investment incentives would require more attention. The region's promise lies in its E-leadership, which is still expected to go up.

1.2. Economic Divide

Figure 13
IN COMPARISON WITH REAL WORLD PROPORTIONS LATIN AMERICA IS UNDERREPRESENTED

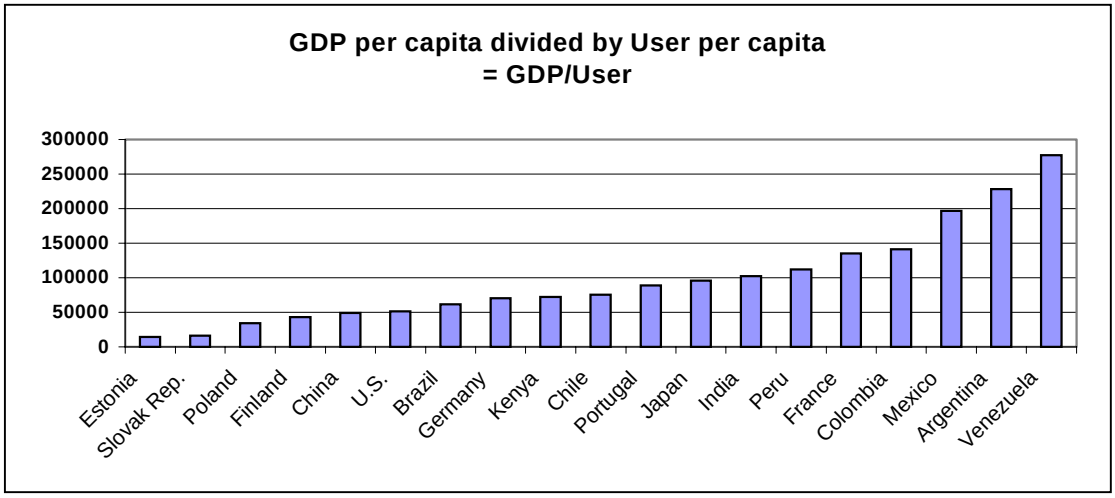


Source: CCS, 2000; eMarketer, 2000

While Latin America is accounting for around 8percent of the world's population, the representation in cyberspace is coming down to 5percent. While the region contributes around 7percent of the global GDP, it only makes one percent of total e-commerce. Latin America lacks behind in terms of how much weight is accounted to digital activities. Using simple mathematics and dividing a country's GDP per capita with the national number of Internet user per capita, we result with the variable "GDP per Internet user". In other words, we can specify which importance (in terms of its economic power) gets accounted to connectivity in a country[41].

[41] Of course, highly depends on the numbers chosen, due to the existing measurement problems and the highly varying numbers available.

Figure 14
ACCESS SEEMS NOT TO HAVE PRIORITY IN LATIN AMERICAN COUNTRIES



Source: Martin Hilbert, 2001; based on Netsizer 04/2001; World Bank 1999 (GDP per cap, Atlas method).

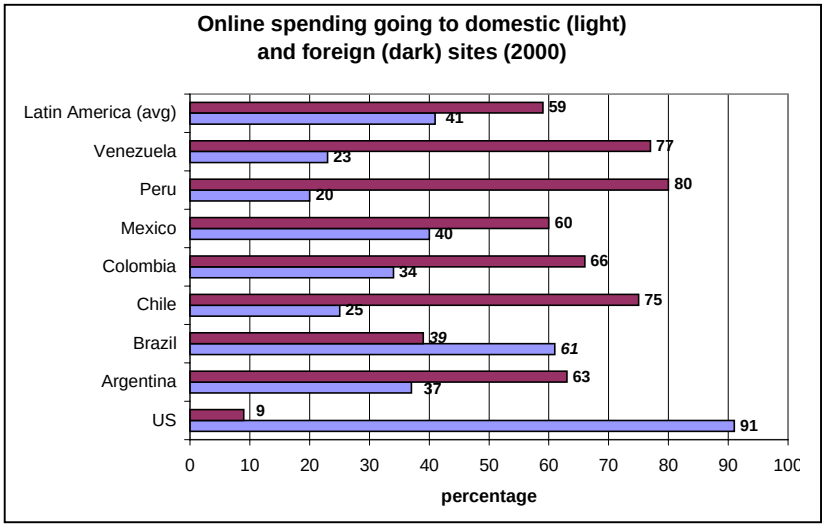
It is often claimed that it is a lot easier for "rich" countries (like the U.S.), to connect itself to the Internet, than in developing countries like in Latin America. Getting rid of these differences in overall wealth, is underlining that other countries in the world (especially in Eastern Europe) are making much more efficient use of their economic potential, with regard to connecting their population. Latin America shifts to the outermost edge and would only be topped by some Arab countries, due to the casi nonexistent connectivity there. Notable best practices are Peru (with very widespread public access), Chile (with very low private access cost) and Brazil (see Chapter III.2).

Of the worldwide US$285.88billion of global e-commerce in 2000, eMarketer is estimating, Latin America accounted for 1.3percent. Only the Middle East and Africa garnered a smaller piece of the global pie, which are accounting for just 0.7percent of Internet spending. North America remains the king of the ever growing e-commerce mountain, representing US$206.73billion, or 72.3 percent of the total. These numbers are not expected to undergo significant relative changes. Deloitte Consulting estimates that the US will account for around US$ 842 billion of the worldwide US$ 1.1 trillion generated by electronic commerce in 2002.

Latin American companies already reach an Internet penetration between 50 to 70 percent (see Chapter IV.1), yet only around 9.4percent of the individual **workers** in Latin America have PC-access to the networked economy (MSDW, 2000). And it is only assumed to double until 2004. Contributing to this, is the low percentage of the business PCs with Internet service (31percent; expected 64percent in 2004), still showing wasted potential in this decisive detail (see Hilbert, 2001; 2.2.1; 2.2.2).

Focusing on **capital flows** inside cyberspace, a dangerous dependency of Latin American countries on foreign providers becomes evident. With the notable exception of Brazil, almost 60percent of the Latin American online spending go to foreign countries. "This is almost like a customer becoming part of another economy." (Hilbert, 2001a).

Figure 15
CAPITAL FLOWS INSIDE CYBERSPACE LEAVE THE REGION



Source: InfoAmericas, 2000.

There are various reasons to explain this. The most striking might be a reflection of the limited availability or lack of a variety of the advanced products, many wealthy "early adopters" are looking for (like electronics, language books, computer software and hardware, etc…). One reason for the Brazilian case might be decisive tariff and especially non-tariffs barriers set up by authorities in the country. Consumers might have to pay 88percent of the declared value of small packages (EIU, 2001), or might have to wait for the item for several weeks, due to institutional controls. Another reason might be that Miami has become the de facto Internet capital for the Spanish speaking market, with many of the more ambitious companies transferring their headquarters there. This might sound strange at first sight, but does make a lot of sense considering the advanced state of adjustment of the United States legal system to the Digital Age, the lower equipment costs and the "death of distance" (Cairncross, 1997). Also the lack of professionallity of domestic retailers is a reason for the low appreciation from regional consumers. At least this last argument will vanish or at least soften the dependency, as regional businesses expand and improve their services[42]. The Cámera de Comercio de Santiago for example, estimates that from the US$ 13million in 1999, only around US$ 3million (23percent) account for sales of national e-tailers in Chile (CCS, 2000). For 2000 the Cámera accounts some US$ 25million out of US$ 45 million to national e-tailers (which would account for astonishing 56percent) (CCS, 2000). Even though this estimations aim at drawing positive conclusions out of development, a trend in the private consumers sector is becoming obvious, which is already known from the business world: out of the US$ 139billion of intra-industry trade in the eleven Latin American Integration Association (LAIA) member countries[43] in 1998, 78percent have the United States and Canada as a trading partner, and only 15percent correspond to intra-LAIA trade (Kuwayama, 2001). By making use of cyberspace, "the small man" (private consumer) is suddenly able to reach as far as traditionally only "big industrial players" (business sector) have reached. The general trend suggests that "the small man" in Latin America will make use of this, for his own personal benefit, creating a threat for his own economy. This is once again bringing the focus back to the old economic discussions about national protectionism or not.

[42] Mexico-based e-tailers increased their share of the domestic online shopping market to almost 50% in December 2000 compared only 20% two years ago, according to a report in Financiero (El Financiero, 2001).

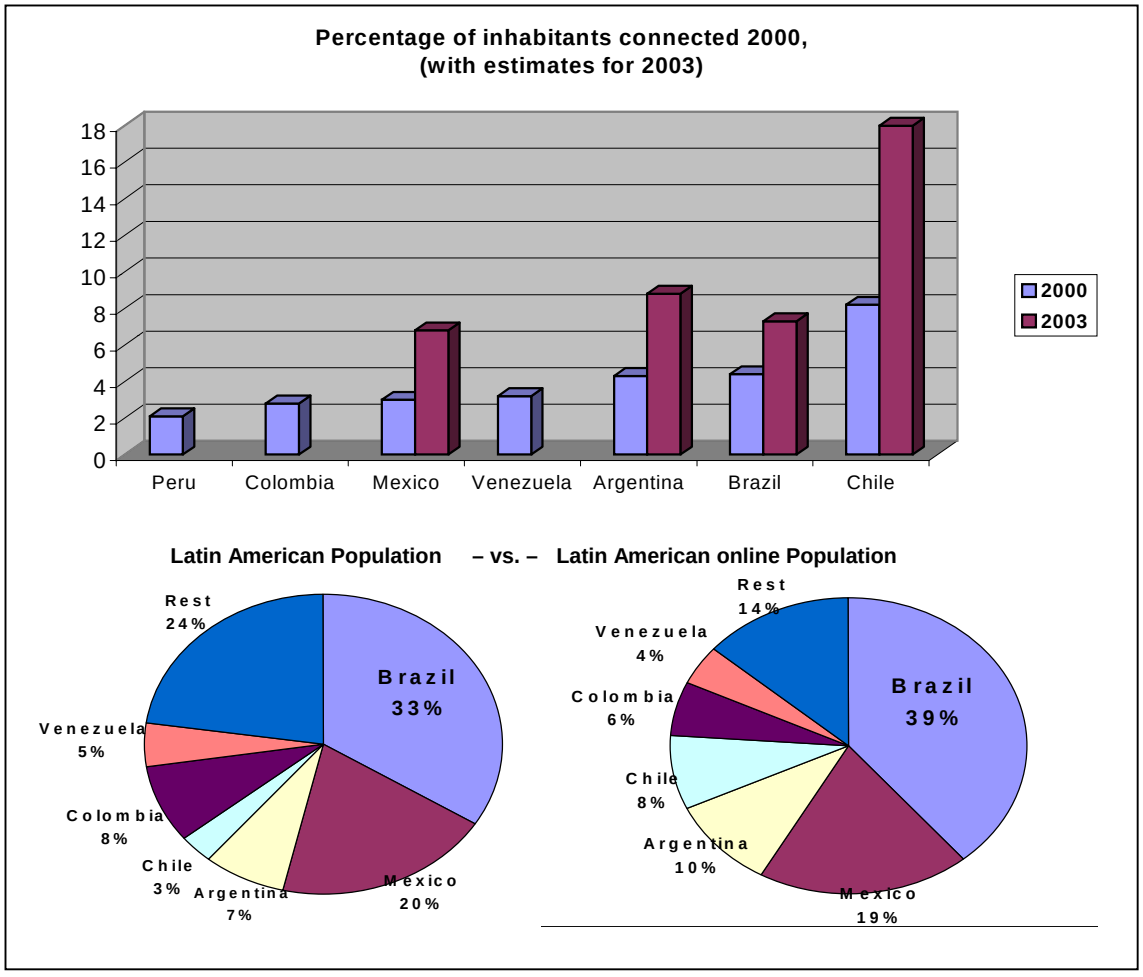
[43] Argentina, Uruguay, Mexico, Peru, Colombia, Paraguay, Brazil, Venezuela, Ecuador, Chile, Bolivia.

2. Regional Divide

> "La brecha digital interna es tanto o más amenzante." (Sr. Jose Antonio Ocampo, Presentacion del Secretario Ejecutivo de la CEPAL ante el segmento de alto nivel del consejo economico y social sobre tecnologias de informacion para el desarrollo, NY Julio 2000).

There is also a divide inside the Latin American region.

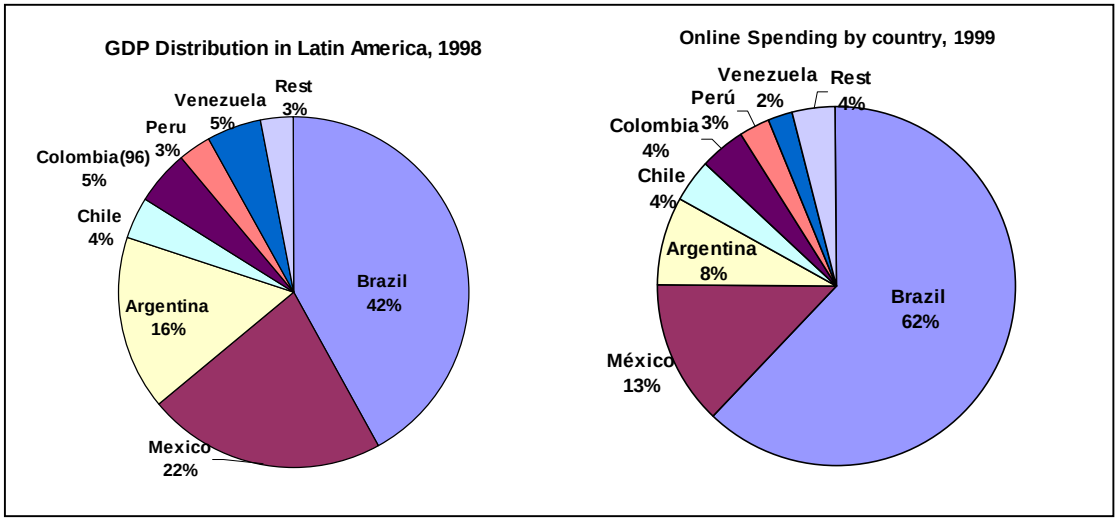
Figure 16
ACCESS IN LATIN AMERICA



Source: Martin Hilbert, 2001; ECLAC, Statistical Yearbook 1999, 2000.

Having a look at the degree of participation of the different countries in cyberspace, it is becoming evident that even though some countries (like Chile or Brazil) are more advanced with connecting their population than others (like Mexico or Venezuela), after all, Latin America's online population is more or less still reflecting real world proportions.

Figure 17
E-COMMERCE IN LATIN AMERICA



Source: ECLAC, Statistical Yearbook 1999, 2000; Jupiter Research, 2000; http://www.jup.com .

Having a look at the economic implementation of the new possibilities, surely Brazil is taking the lion share here. This is by far not anymore reflecting real world economic activities. In literature Brazil is known as "the region's Internet early adopter" (U.S. Department of Commerce, 2000) or the "powerhouse of Latin American e-commerce" (eMarketer, 2000). It became a popular discussion between digital economists in the region, why Brazil is as far advanced. What are the reasons for the **Brazilian pre-eminence**?

Of course when dealing with a complex question like this, there are many factors influencing. One obvious argument might be scale, which is as important in Internet economics, due to network externalities (Hilbert, 2001a). Also the government's role has been highly proactive and by no means neutral, helping tremendously to gain the trust of the people, to make use of the new tools (see Chapter VI). Another argument, which always gets mentioned, is the role private banks played in this process of adoption. Like in other countries o the region, banks have been playing a crucial role in Brazil over recent decades. Great economic instability and inflation demanded a banking system, which works efficient, very quick and possesses the trust of its clients. Like this, the banking sector has been "forced" (in a way), to constantly look for innovational solutions to deal with the problems they are facing. The special characteristic of Brazil is a system of "double intermediation", which left the Brazilian banking sector as the big financial winner of the time of hyperinflation during the 1980s. The combination of mainly three factors: extremely rich banks, the fact that in Brazil banks are not allowed to invest in other private business besides themselves and visionary individual leadership lead to the constellation that Brazilian banks highly invested in improving their own way of functioning. The use of modern ICTs in banking is a tremendous chance for a bank. Of course in a region where the traditional postal service is neither reliable nor dependable enough to carry out basic necessities, the potential for online banking is vast to begin with. Additionally there is the aggregate value of the online service in the overall final performance (effectiveness, comfort, etc.). But online transactions are also a lot cheaper for the banks (transaction cost branch: US$1.07; transaction cost Internet: US$0.01 (Booz-Allen Hamilton)). Like this one of the most developed banking sectors of the world emerged and brought a lot of positive spill-over effects with regards to the incorporation of the new tools in the country.

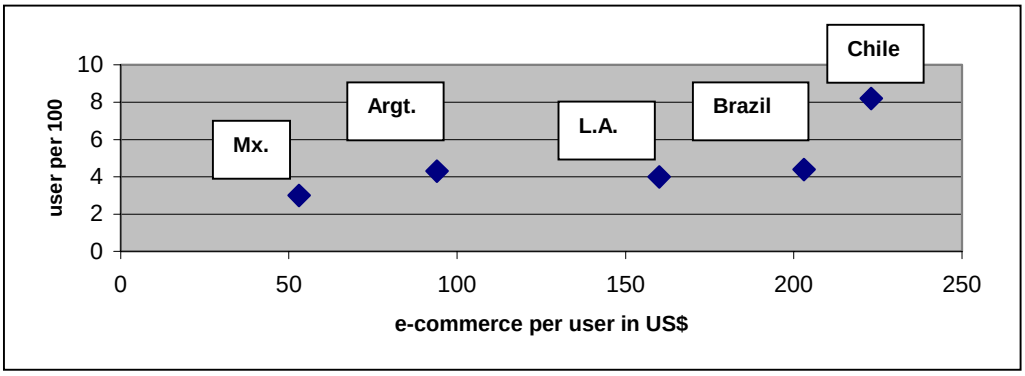
Due to investments in their own way of functioning, Brazilian banks took a very strong leadership role in the development of e-commerce[44].

Another kind of Divide is the one with regard to computer literacy, means on how far advanced are Internet users, and how far are Internet Economics already implemented and accepted by a society. Using the volume of e-commerce, or the number of people participating in e-commerce as a barometer is common praxis to do so. One way would be to have a look at the so-called "**surfers-to-buyers ratio**". 40 percent of Latin America's Internet surfers are Brazilians, but Brazil is providing around 60 to 70 percent of the region's online spending. Brazil's surf-to-buy ratio is therefore higher than the one of Mexico, which is providing 19 percent of Latin America's surfers, but only 13 percent of the online spending. While the surfers-to-buyers ratio partly also reflects the macroeconomic performance of an economy, it is surely highly related to the level of familiarity of Internet users as well (be it on the demand or the supply side). Research agencies set the surf-to-buy ratio at about 17 to 20 percent for Latin America for 2000 (emarketer.com, idc.com, 2000), up from 8 to 15 percent in 1999 (Latinnews, Jupiter, 2000). This is pretty low, comparing to a ratio of 58 percent in the United States, but numbers vary here as well. Nazca Saatchi and Saatchi found that 27percent of Latin American Internet users surveyed recalled having made an online purchase, while IDC's estimates a range from 29 percent in Chile to 43 percent in Mexico (measured by advanced Internet users[45]!). Jupiter is predicting Brazilian's surf-to-buy ratio to raise up to 37 percent in 2005.

Instead of looking at how many people participate in e-commerce, it could also be focused at the volume of e-commerce (including B2B, B2G, etc.). Like the following graph is showing, the volume of e-commerce seems to increase with the number of people connected.

Figure 18

ACCESS AND E-COMMERCE IN LATIN AMERICA



Source: Martin Hilbert, 2001.

Higher connectivity in Chile, in comparison with Mexico, seems to contribute to the fact that more money per Chilean is flowing within the Chilean cyberspace, than more money per Mexican in the respective case. While this is just a general trend and does not explain everything (like the case Argentina vs. Brazil is clearly showing), overall diffusion is surely one important contribution factor to familiarity (counting for a penetration of over 60percent in North America, would is claiming for an e-commerce volume per user of more than US$1000). On the other hand, there are

[44] Also in other areas of the digital economy, as we saw above with the example of Banco Bradesco, which introduced the free ISP model into the region.

[45] Advanced Internet users are users, which respond to Internet based surveys (like through banners, etc.).

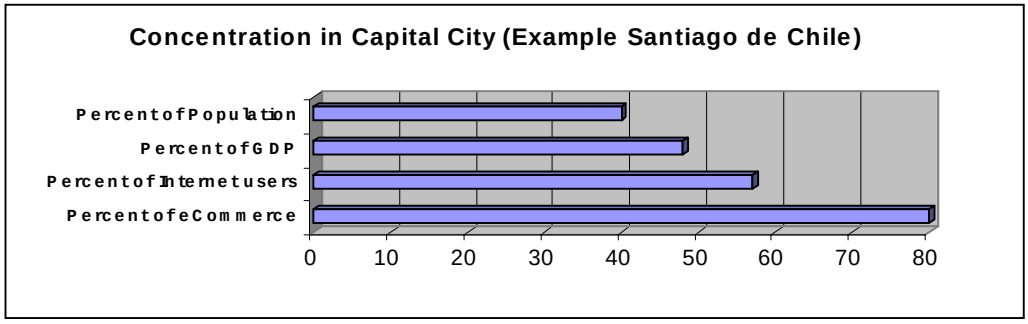
other positive impacts like killer applications[46] or interfering obstacles, like missing credit cards, security issues, etc.. A more detailed analysis is needed when discussing the adaptation to the new possibilities. Talking about the learning curve, with regard to making use of the new tools in general, some examples show that learning curves can even have steeper slopes than diffusion curves. Often the possibility or ability of an individual to get a benefit from ICT without operating the desired services directly and in person, is not getting considered (Takahashi, 2001). In Brazil the estimated number of Internet users was around 8.5 million, yet around 10 million people submitted their income declaration for taxing purposes through the Internet. "What happens and explains this discrepancy in numbers is that many of the informants get the help of professional accountants who are the effective Internet users in order to send the declarations on-line" (Takahashi, 2001). People understood to make use of the new possibilities, without possessing them personally. It is therefore about access, not ownership! An economy can profit very well from modern ICT if their people trust, accept and understand to make use of their existence.

On balance, the digital divide is on one hand about connectivity (diffusion curve) and on the other hand about making use of what is given (learning curve). Both have to be considered, and both can create a divide or a digital opportunity.

2.1 Geographical Divide

There is of course also a divide with regard to the geographic distribution inside a country. Latin America is generally speaking a highly urbanized region (Mexico: 75percent urbanized; Brazil: 80.4percent; Chile: 85.7percent; Venezuela: 87.4percent; Argentina: 89.6percent (ECLAC, 2000)). This continuing trend of urbanization gets reflected --and often highly multiplied-- looking at numbers that represent the implementation of modern ICT and Digital Economics. In Argentina, for example, 87percent of the Web sites had their physical domicile in Capital Federal and the Providencia of Buenos Aires in 1999 (CACE, 1999).

Figure 19
GEOGRAPHICAL CONCENTRATION



Source: CCS, 2000; http://www.ccs.cl .

On the one hand this might be seen as very dangerous, given all the disadvantages of exclusion from the knowledge society for the rural area. On the other hand, for overall progress and speed of development of the entire country, this model can be very efficient. Due to the heavily concentration of huge masses in little area, it is easier to provide service with minimum input and

[46] A killer application is generally speaking an application which successfully entered the mass market and therefore also drives many people to using an ICT. E-mail would be the killer application for the Internet in general, SMS for the 2G mobile phones in Europe, i-Mode in Japan. If now a government, for example makes it profitable for companies to pay their tax online, and in order to do so, many SMEs will adopt to online transactions because of this, online tax paying would be a killer application for SMEs and familiarity and online transactions will increase.

maximum output. Examples include wireless access covering[47], or logistical delivery of non-digital goods. Due to the concentration, the upgrading and maintenance of infrastructure is bringing a higher pay-off in urbanized areas, leaving rural areas ever behind. São Paulo, became one of the most famous best practices how big scale, assembled in a relatively small area, in combination with euphoria and visionary actions, can highly accelerate the speed of development and progress. This kind of development is raising questions about the marginal cost of connectivity and benefit of it -- as a "public good"--, and the need for public subsidiaries for universal inclusion (Chapter VI.3).

2.2 Divide between rich and poor

> "We believe that access to telecommunications is a fundamental human right." Yoshio Utsumi, Secretary-General International Telecommunication Union (ITU), on the World Telecommunication Day, 17 May 2001, the 136th Anniversary of the founding of ITU.
>
> Human Rights Declaration of 1948, Article 27: *"Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits."*

Looking at the general relationship between telecommunications and wealth, it is obvious that they are strongly positively related. The divide between rich and poor is a divide of costs. Traditionally electronic devices are even more expensive in developing countries like in Latin America, than in the developed world --like in the north of the hemisphere-- even though income per capita ratios are reverse.

Figure 20

ELECTRONIC DEVICES ARE OFTEN MORE EXPENSIVE IN LATIN AMERICA

PRICE COMPARISION ICT EQUIPMENT COST

(left picture **Chile** in Pesos incl. shipping: exchange rate 1/590 => 215990:590= **total US$ 366.08;**
right picture **United States** in US$ + US$13.25 shipping inside U.S.= **total US$ 178.20)**

Source: Falabella; http://www.falabella.com; Excite; http://www.excite.com; 04/2001.

The combination of low income and high costs for electronic devices in the fast changing ICT industry, is representing a major obstacle for the region. It is hard to find worldwide comparisons on price discrimination for electronic devices, even though this seems to be one of the

[47] It is calculated that it needs 30-40 antennas to connected entire Santiago to the WLL (wireless local loop), whereas for entire Chile 350 antennas are required. Here we can see that it would need only 10% of the investment to reach 39% of the population.

most urgent issues to discuss[48]. One possibility to soften this development would be to considerate participation in the Information Technology Agreement (ITA), in which 30 WTO members committed themselves to gradually eliminate all import duties on telecommunications equipment, including PCs and their component parts (Chapter VI.3). Another possibility would be national production. In order to meet demand (cheap and highly sophisticated), an interesting category of companies emerged in some Latin American markets. They make use of what could be called "reverse outsourcing". Mainly starting from knowledge about computer devices, high quality and far advanced hardware parts get bought to cheap prices from all over the world, and get assembled for less than US$10 per computer, inside the country. Like this, hardware (often even with guarantee) can get obtained to reasonable prices, just lacking the brand name[49]. With exception of a few parts such as resistors and transformers produced for special purposes, there is no parts industry in Chile connected with the electronics and computer industries, for example. Nearly all parts are imported. However, even around 10percent of Chilean electronics products are exported, mainly to Latin American neighboring countries (Kuwayama, 2001). Looking at the macro, some analysts are expecting that the sharp decrease of PC sales in the U.S. are going to have a positive impact on emerging markets like in Latin America[50] (IDC, 2001). Considering the dynamic convergence of ICT, notable that accessing the net of nets is not necessarily limited to a PC. To combine a Personal Computer and Internet access, might be a useful constellation in some fields (like in the office) but can also be too much of a good thing for other uses. Cellular and television are only two emerging alternatives to enter and profit from the network of networks. Different types of ICT-hardware get developed for different demands, and also for different "wallet-sizes".

The savings come to a halt once it comes down to software. While often black markets[51] are the only alternative for a great part of the population to be able to keep up with the fast changing industry, the focus should officially be set more on open software (like Linux), while the big question for Latin America remains if it is not already too late to switch[52]. Having a look at the business sector the software problem is even worse. While access and hardware costs are declining, the ongoing cost of ICT support represents a large investment, especially for SMEs. Even SMEs in the United States suffer from lack of funds for e-commerce applications[53], up-front implementation costs and lack of monthly cashflows to maintain their sites (Kuwayama, 2001).

Overall communication cost is generally a combination of some fix costs on the one hand (normally a phone, or the hard- and software of a computer), and some variable costs on the other (ISP, telecom charges…).

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48 While not the entire price difference might be explained by pure discrimination: shipping costs, import tariffs and the missing sales tax for U.S. online sales make a part of the margin showed in the graph.

49 This kind of computer assembling, does until now only work of the PC market, not for more sophisticated devices (like laptops or Palms (see graph)).

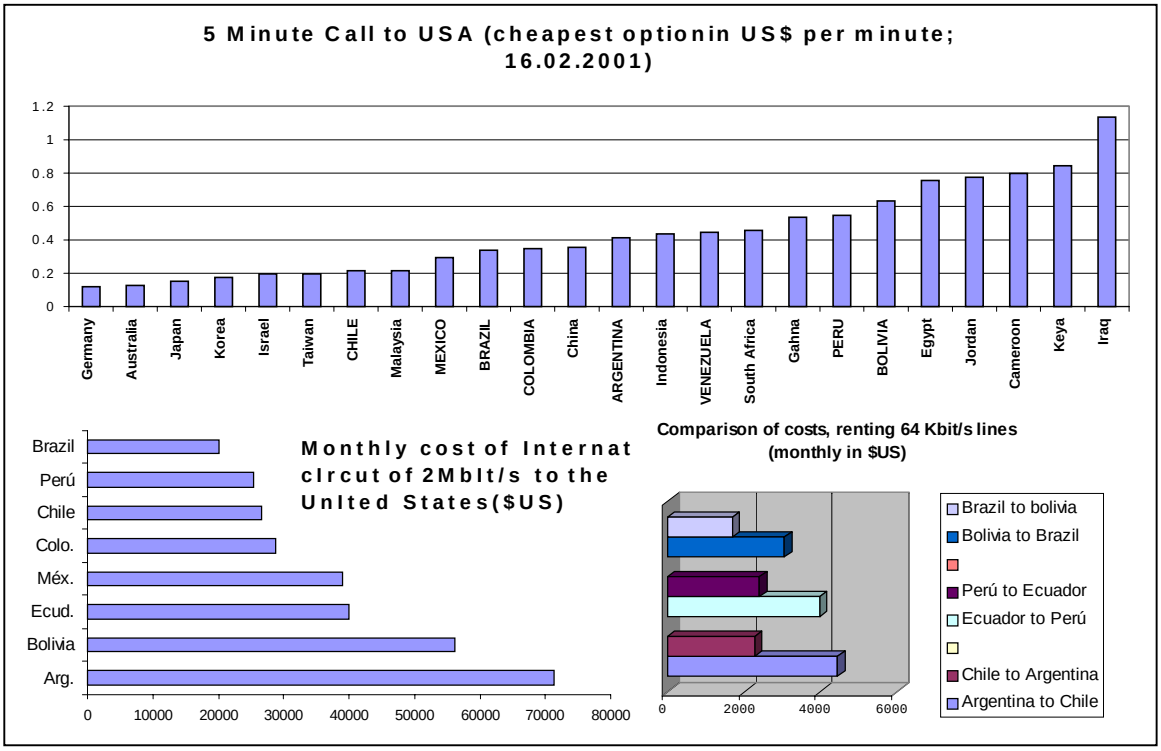
50 "PC makers in Latin America shipped 1.8 million units in the first quarter of 2001, 39 percent more than the same period last year, despite an apparent deceleration." (Gartner Dataquest 18/05/2001).

51 Software piracy is seen as a severe problem for economic relations between software producing and consuming countries. According to a recent study of the Chilean newspaper El Mercurio piracy (especially in the main economies of the region) is steadily falling, but nevertheless the level of software piracy in Latin American countries are still as followed:
Bolivia: 85%; El Salvador: 83%; Paraguay: 83%; Honduras: 75%; Costa Rica: 71%; Ecuador: 71%; Uruguay: 70%; Perú: 63%; Argentina: 62%; Venezuela: 60%; Brasil: 58%; Colombia: 58%; Mexico: 56%; Chile: 51%; Puerto Rico: 48%; Europa Occidental: 34%; Estados Unidos: 25% (El Mercurio, 2001).

52 However, some research agencies report about explosive growth of Linux in Latin America (www.idg.net/go.cgi?id=466255, www.ebusinessforum.com/index.asp?layout=rich_story&doc_id=3245). IDG even expects **Linux** to reach a **33percent penetration by 2003** (http://idgnow.uol.com.br/idgnow/corporate/2000/09/0055). In March 2001 Mexico City announced its switch to free software. The Argentinian government recently revealed plans of a bill that would require its agencies to use open source software (IADB, 2001).

53 Such as enterprise resource management (ERM) applications, supply chain management (SCM), business intelligence (BI) applications, or customer relationship management (CRM).

Figure 21
VARIABLE ACCESS COSTS

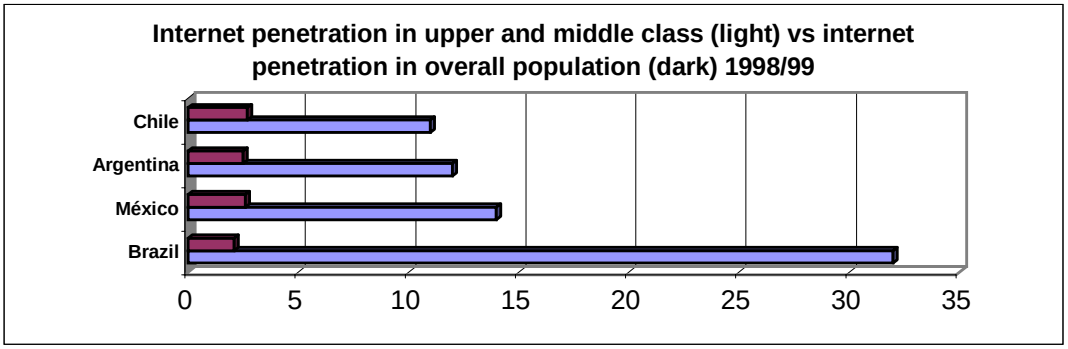


Source: Bestratecalls.com, http://longdist.net/?bestratecall; Peter Stern for the Superintendency of Telecommunications, Bolivia, (ITU, 2000).

Focusing on variable access costs on a worldwide scale, Latin America is taking a middle position between the clearly favored developed countries and less developed often less competitive countries, like in the Middle East or Africa. Inside the region there are also big differences, which are mainly due to discrepancies of competition or regulations. While communication cost is a field of great dynamics, the picture here is changing constantly, as for example higher competition is expected in key countries, like Argentina and Brazil during this year. Nevertheless it would be premature to evaluate the results in these cases.

Due to the fact that ICT is not a public good, people with the greatest economic power are generally the first ones to be able to afford access to modern Information and Communication Technologies. The **upper and middle class** reached a relatively high Internet penetration already at an early stage of development in the region. According to the Boston Consulting Group about one-third of the Brazilian population in the upper and middle class had Internet access in early 1999, in contrary to a national overall connectivity of around three percent.

Figure 22
THE DRASTIC INCOME DIVIDE IN LATIN AMERICA 1998/1999

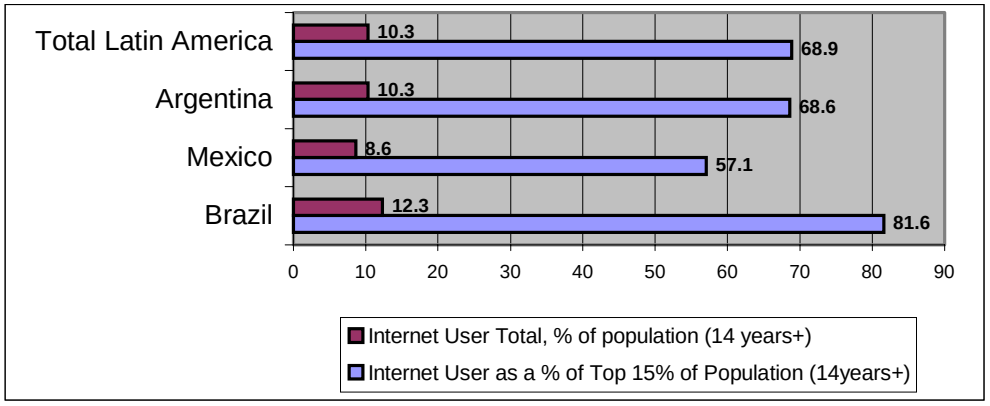


Source: ITU, Americas Telecommunication indicators, 2000; BCG, 1999.

Right now overall Internet penetration accounts for around 4 to 5percent in the region. But only the region's upper socio-economic strata, (about 10-25percent of the populace, depending on the measurement conditions), is currently accounted for being effective "online-potentials". Nevertheless the number of people which posses sufficient economic power to pay for Internet access and drive consumer commerce are changing rapidly, as access cost fall and consumer commerce gets facilitated. While in July 1999 the BCG claimed that approximately 10 million Latin American households had enough economic power to afford Internet access (BCG, 1999), in their consecutive report in 2000 it was stated that due to WebTV and free ISP almost half of the population would theoretically be able to afford simple access (BCG, 2000).

Nevertheless, practical numbers give enough reason to seriously worry about the divide between the "information rich" and the "information poor" in Latin America. According to Emarketer's estimates, 18.1percent of the "top 15% of the Latin American population" have been connected in 2000, compared to an overall connectivity of 2.7percent . In 2004 these discrepancy is expected to rise, for example to 81.8percent in Brazil, in contrary to an estimated overall connectivity of 12.3percent (eMarketer, 2000a).

Figure 23
THE ACCELERATING INCOME DIVIDE IN LATIN AMERICA, ESTIMATES 2004



Source: eMarketer, The eLatin America Report, with friendly permission, 2001.

Numbers here vary as well, but it is generally accepted that around 50percent of the "realistic market" (that means upper and upper middle class --what often gets classified as A, B and C1) will be connected by 2003 (infoamericas, 2001).

Keeping Latin America's harsh gross socioeconomic inequalities in mind, it is clear that those relatively few who are online, are not only in the advantage of accessing the unlimited vastness of information in cyberspace, but also control a major part of the region's income. According to the definition of the knowledge society and the crucial role the important input factor "information" is playing in a knowledge-based society (Hilbert, 2001a), worries about increasing inequality in the region seem very justified. Increasing economic inequalities might be the first ones to become obvious, given the almost pecuniary value of information, and the application of information --which is knowledge-- in a knowledge-based economy (Hilbert, 2001a). But the information society is about a lot more. Access to the network of networks is providing assistance in general education, health issues, political information, cultural development and all the things, which at the end are aimed at contributing to maintain or to reach social peace in and between communities.

This flagrant injustice makes the region on the other hand not less interesting for investors. Looking at it from this perspective, low access penetration can be neglected. Somehow positively from an economic point of view, as at least most of Latin Americans "purchasing power" should be "connected to the network economy" pretty soon, the socially dangerous gap between the haves and the have-nots accelerates to widen meanwhile, reflecting and reinforcing the more fundamental economic and social divide between and within countries.

3. ICT for development

In absolute terms, the number of Latin Americans living in poverty right now is as high as ever before: 224 million. In relative terms, poverty has fallen between 1990 to 1997, from 41percent to 36percent, but this still has not been enough to make up for the rise in the eighties (35percent to 41percent) (CEPAL, 2000a).

On the global level a discussion evolved about whether it is desirable to invest money into modern ICTs for poverty reduction, or instead to aim "more directly", or in traditional ways at reducing poverty. The discussion continues, yet the majority already moved away from this kind of "either-or" approach[54]. However, one always has to ask what are the things that a society or social group urgently needs, and which of the new tools would most effectively provide them with the information they need, without getting caught up in enthusiasm about what new things are technically possible already. Poor regions are facing a whole set of problems. Without setting an order, they may be seen as "front-up" issues (e.g., provision of basic services such as water, pharmacy, electricity) and "back-up" issues (e.g., development of ICT or education). Solutions will have to be found in addressing the front-up issues through the application of back-up issues. "ICT is not an end in itself, but a (powerful) means to an end[55]" (UN ICT Task Force, 2001). How, for example, can one aim more efficiently at reducing poverty than by providing a couple of cell

[54] "Sin embargo, la solución de nuestros problemas más apreminates no debe hacernos postergar nuestra integración a la Sociedad de la Información, ya que, más bien, las innovaciones tecnológicas que ella trae consigo pueden ayudar a resolver de manera más expedita varios de los problemas que actualmente nos aquejan." (Grupo de Río, 2001, "Nueva Economía, Brecha Digital y Empleo: Propuestas para la Integración de América Latina a la Sociedad de la Información", XX Reunión de Ministros de Relaciones Exteriores).

[55] UN ECOSOC, UN ICT Task Force ("Report of Secretary-General"): "The challenge before us is to enable the currently excluded 4billion of the world's population to participate in and benefit from the information revolution. …The Task Force should aim to harness ICT to bridge the social and economic gaps that divide the world –not as a substitute for broad development efforts, but to complement them as a leveraging factor that can empower the por with the knowledge an skills they need in order to grow out of poverty." (UN ICT Task Force, 2001).

phones to a group fishermen, so they can create their own network, boosting productivity over night, as was the case in India[56]? How much more independent and efficient can developing regions commercialize their (traditionally large) focus on tourism, by dis-intermediating their businesses[57]? How much does it cost --compared with the great development programs of the past-- to connect poor farms to the worldwide knowledge networks, so that they will be able to make use of the accurate weather forecasts (e.g. of the United States military), check the actual market prices in real time, reach high quality consultations about an animal sickness almost instantly, etc.[58]?

As experience is showing, the most substantial way of development aid is not patronizing, but rather helping to stand on ones own feet. The amazing thing about Information and Communication Technologies is that their network can be fed with the individual content desired. Focuses can be set regard to the individual needs and priorities, substantially supporting development specifically. By definition ICT is also the most powerful tool to enhance new knowledge (which is the application of information) and therefore definitely is the best-equipped tool to help bridge the gap, while the world is advancing towards the Information Society.

Leapfrogging is one of the most popular issues in the ICT-for-development discussion. On the micro- as well as on the macro level, there is --of course-- no leapfrogging on diffusion and learning curves. The most basic development scheme, where learning to walk precedes learning to run and where the size of the steps defines the pace of movement, reasons this. But there is nevertheless leapfrogging on the decision about which technology to ride down these two curves[59]. There is a large variety of all different kind of tools available in the ICT sector. Some more advanced and some less. Some more helpful for the specific situation, some less. We know for many years already that the provisions of telephones and radio is a lot more efficient in a low developed region (with often high illiteracy rates) than introducing newspaper or telegraph. We know that in Africa nowadays many people surf the Internet before they ever made their first phone call. We know that in a country where the traditional postal system is neither secure nor dependable, applications like online banking have vast potential, leapfrogging part of the postal system development. We know that while at the end of 2000 telephone line penetration only reached 15percent in Latin America and only 5percent owned a computer, the mobile telephone became the most widely spread telecommunications medium in many countries of the region, penetration of television passed 80percent and the electricity- and mobile network coverage in the region is also almost complete. Furthermore broadband (which means content) does actually not exist in Latin America. And we also know about technological e-novations, discussed in Chapter

[56] Referring to an example of a poor **community of fishermen in Kerala (India),** who always have been networking together (The Economist, 2001). Recently they started to discover mobile phones. This has been raising the productivity of these fishermen tremendously. Now they are suddenly having full information about the highly fluctuating fish prices, while before deciding which would offer the best price was sheer guesswork, which has been leading to a great misallocation and losses. They also "dis-intermediated" their information flow. Keeping each other informed about lucrative fishing grounds, saving expensive fuel and energy, or being able to stay informed about the latest weather news are all factors that contributed to the advancement. Their traditional network (which most probably usually has been taking place at the harbor early in the morning or during a cup of tea at night) has been replaced by a lot more efficient and real-time network.

[57] World Tourism Organization: "…niche players are no longer constrained by the cost of breaking through goegraphic barriers. The niche player can now tackle global markets. …world markets can be captured by organizations which, a few years ago, could not have contemplated looking beyond their borders. Global distribution is available to the smallest players" (WTO, 2000).

[58] Veerampattinam, a village in India, is actually one of five now hooked to the Internet as part of an Indian research center's village information project (M.S. Swaminathan Research Foundation (MSSRF)). One of the villages serves as the information hub, with full access to the Internet. The others have wireless access only to the hub, to which they send information and requests for information. The hub searches the web and electronically delivers the requested information to the other centers, along with standard information in an email newsletter. This hub-and-spoke model avoids the cost of providing full Internet access to all villages and also creates a network for information sharing across the villages. MSSRF and its granters fund the project, asking only that the villagers house and operate the technology (IFPRI, 2000).

[59] "Developing regions may potentially leapfrog traditional copper- and fiber-based land lines, and go directly to leading-edge wireless technologies that blend voice and data (broadband) over the same networks." (OECD, 2000a).

II.2[60]! There are many examples from small countries like Singapore, Costa Rica, Uruguay, Taiwan or Estonia, where a lot of visionary political will, helped the society to jump, in a very short time, onto the vanguard of technological development. The case of Estonia is impressive: after its independence in 1991, the country started with a GDP per capita in real terms around $600, virtually no computers, no mobile phone network and the existing telephone net was really a "leftover from the nineteen thirties". After a combination of well-designed policy issues, aiming at e-Readiness[61] the country ended up only 9 years later with "a higher rate of Internet penetration than half of the European Union", more than 40percent mobile phone penetration, a broadband fibre optic connection network spanning the entire country and a GDP per capita of $2000 (DSE, 2001a). Estonia and Taiwan were the only countries in McConnell's e-Readiness ranking (Chapter III.1.1), that achieved the highest score in three different categories. While the industrial age created development gaps during the last century, which seem impossible to catch up (industrially), around ten years ago, countries of very different degrees of industrial development, started more or less on a level playing field with regard to their digital development. This gave and is giving --as the high-speed-evolution is continuing-- developing countries a chance to overtake highly industrialized countries with regard to making successful use of the new possibilities (for example third Generation spectrum placement[62]). The economic and especially the psychological effects on the "leapfrogging" country seem impressive. Nonetheless, most successful examples --which have been implemented until now-- come from very small countries, whereas in larger countries the benefits often only get contributed to a small fraction of the population, creating a "leapfrogging island" (which is digitally surely competitive with the so-called developed world) inside a slowly developing society[63].

The core of the ICT-for-development discussion is a more long-term issue. The point is that, instead of being afraid of globalization, technological progress and digitalization, and hopelessly trying to fight or soften its impacts, better stand up to it, by making use of its own tools. It may on one hand be a question of not falling further behind, and like this improve one's absolute level of development, by jumping on the train of overall worldwide progress. But the outstanding feature about modern ICTs is that they bring so many special leveraging characteristics[64] that there is a historical chance for the poor to also improve their relative degree of development. Which brings us back to the "Big Equalizer" or "Big Divider" question.

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60 3G, digital television and powerline for example, are all expected to have transition-rates higher than most of the actual "traditional" broadband solutions.

61 See: http://www.dse.de/ef/digital/ilves-e.htm .

62 For example the WDCMA (or UMTS) technology, which is requiring a separate band in the radio spectrum. This is making it in some cases even easier for developing countries to adopt to this new (and very powerful) tool, than for some developed countries (like for example the U.S., which is having a lot of its MHz bands occupied already with other services).

63 The other way round we could also claim that in the developed world there is a fraction of people (often the poor minority) left behind, leading to globalized world-views, where the "developed segment of this world" meets in cyberspace (regardless to its geographical belongings) --implementing the information society already--, whereas the "low-developed segment of this world" (be it someone of the slums in Washington or the favelas in São Paulo) is left behind. "Desde el punto de vista político, el crecimiento y la difusión de la tecnología de la información y el comercio electrónico parecen estar dividiendo al mundo de una forma nueva, no en función de ideologías políticas, ni de estado-nación, sino desde el punto de vista de la posesión y acceso al conocimiento. Las clases sociales y económicas de hoy traspasan las fronteras y se están formando horizontalmente y a escala internacional dentro de un modelo más global que se asienta en la Red. La nueva línea divisoria parece formarse entre los que poseen conocimientos, en otras palabras, acceso eficiente a Internet, implica que, quienes gozan de esto se comunican e interactúan cada vez más entre ellos, desarrollan progresivamente valores en común, estilos de vida y hábitos de consumo en todo el mundo sin moverse de su computadora, esto es, de su lugar físico habitual."(ALADI; Associacion Latinoamericana de Integracion, "Situacion actual Perspectivas del comercio electronico en los paises de la ALADI"; 09/2000; http://www.aladi.org/inicio.htm)

64 "ICT can have a levelling potential, giving poor countries and poor people access to markets, information, and other resources that would otherwise have been inaccessible." (OECD, 2000a).

4. Conclusions Digital Divide

> "... (Some) claim the Internet to be the "Big Equalizer." Comparing with the obstacles we have faced before, it has never been easier to bring everybody up to the same level." ("From Industrial Economics to Digital Economics: An Introduction to the transition." p.108)

The real divide is not a digital one. The real divide is social and economic in nature[65]. What starts as a divide of costs, becomes a question of social participation. The digits underline and emphasize the social and economic inequalities inside and between societies, evoking fears about creating conditions of exclusion (big divider). According to the Kutznets curve, when something useful, but scarce gets introduced into a social setting where resources and opportunities are already distributed asymmetrically, it is more likely that those with more resources will employ them to gain additional ones, increasing inequality, in the short term. The goal is, to leverage this curve (to fasten the process of adoption to reach all society), before conditions of exclusion manifest[66]. This goal can be set for the international and national range.

In order to be able to make the best of it (or to avoid the worst), it is essential for developing countries to understand and to observe the reality and development of the developed world very carefully. This is essential in order to make the most of leapfrogging and therefore catching up in the high-speed evolution from industrial- to digital economics. On the other hand, it is essential understanding the specific problems Latin America is facing with implementing the Digital Economy[67]. Definitely the development of Latin American's Digital Economy will go another route than the US or Europe did. In some cases Latin America is far more advanced than even the leading United States, in making efficient use of modern ICTs (see the income tax-paying example of Brazil (Chapter VI.2)). But the downside of the coin is surely a demanding one. Problems such as the fact that the majority of Latin Americans shop outside their country when shopping online, the brain-drain, as well as the urbanization of development and progress or the low surf-to-buy ratio are regional problems we will have to face. Low PC penetration, low fixed-line telephone access, high mobile phone and television penetration, low credit card ownership and insufficient fulfillment mechanisms mean that businesses need to focus on different solutions. Alternative access devices, the proactivity of individual actors (such as the banks; also Chapter IV.5) and the e-commerce extension onto existing retail outlets (clicks-and-mortar) will mark regional markets.

Positively for investors, most of Latin Americas economic power is expected to be connected to the network economy very soon and the vast majority of the population is reachable in comfortable distances in a logistical and e-frastructural sense (urbanized areas). This is creating flourishing and self-sustainable markets. On the other hand, many countries in the region are

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65 "Habida cuenta de las nuevas condiciones en que se desenvuelve la economía mundial, la llamada "Sociedad de la Información" es cada vez más gravitante para nuestros países y se hace cada vez más patente que, en un futuro no muy lejano, la brecha entre las naciones más ricas y más pobres estará determinada por al capacidad de dominar y aprovechar mejor las tecnologías de la información. El conocimiento, la tecnología y la información serán mucho más relevantes que los recursos naturales, la abundancia de capitales o la mano de obra barata para formar parte del grupomás próspero de la economía mundial." (Grupo de Río, 2001, "Nueva Economía, Brecha Digital y Empleo: Propuestas para la Integración de América Latina a la Sociedad de la Información", XX Reunión de Ministros de Relaciones Exteriores).

66 ECLAC, "Latin America and the Caribbean in the transition to a knowledge-based society: An agenda for public policy": "In each country only a small segment of society has access to these new technologies, and countless forms of exclusion and adverse selection are at work." (ECLAC, 2000).

67 ECLAC, "Latin America and the Caribbean in the transition to a knowledge-based society: An agenda for public policy": "The latecomers to this process may take advantage of the knowledge that has been accumulated and do not necessarily have to go through each of the stages of learning that their predecessors had to complete; however, their relative degree of underdevelopment and the financial constraints they face as they begin to make the transition to information and knowledge-based societies make it necessary for them to undertake a determined investment effort to (for example) build up their infrastructure and to develop the necessary human resources." (ECLAC, 2000)

running a high risk of creating a "society of exclusion". The focus gets set on the economically interesting part of a society. Markets are mainly created for the top 15 to 25percent of the population and the rest seems to be left out. Business and government (see also Chapter VI) create two social realities: one for the "have" and one for the "have-not".

It is true that in the developing countries of Latin America the possibilities of allocating resources to investments in modern ICTs are limited. Nevertheless the region is far behind the rest of the world in terms of making efficient use of their available economic potential, with regard to incorporating the new opportunities. Eastern European countries, for example, seem to put a lot more importance on advancing to the Digital Age, in comparison with Latin American countries.

Text box 2

ACCESS- NOT OWNERSHIP [68]

In the "new age economy", the source of competitive advantage is predicated on privileged and easy access to sources of competence. Therefore it is about access, not ownership! In a fast changing industry, ownership may not be the best choice, even for the well to do. The public access model is another special characteristic, which became very important for Latin America. While Netsizer counted for 2.28 Internet users per Internet host in the US, in 04/2001, it counted for 79.96 in Peru (www.netsizer.com). Latin America's internet community is growing at an impressive speed, but even if it will continue to grow 36percent until 2005 (like expected) –which will mean an almost 20percent connectivity then – and will then take on the growth rate of Europe (which has been at an 20 percent connectivity in 2000), Latin America will need another 13 or 14 years to reach the 50percent penetration the U.S. passed in 2000. A time span, which becomes light years, counting in Internet time. This is a vague calculation, but demonstrating the challenges. Making use of adequate new technologies (like 3G mobile, digital TV, set top devices, etc.), as well as public access points can surely bring down this time tremendously.

The model of public access is not new and has successfully been pioneered by the traditional telephone. In Argentina, so-called NetKiosks providing public Internet access in the pedestrian precinct. Everybody can send, receive and print mails, order movie tickets, or chat through a web-cam with a friend, using the newest technology available. There are many other examples of public access from the public and private sector. Nevertheless the most successful ones come from the private sector (like in Peru). The public sector does have problems in keeping up with the speed of development in the ICT sector, and should rather concentrate on setting Macro-variables right, like low personal access costs (Hardware, open-source software, low telecom prices), or supporting cheap e-novations (like powerline, Set-top devices, etc.).

Source: Martin Hilbert, 2001; netkiosk.com.ar .

[68] Another efficient example of "access not ownership" are Little Intelligence Communities (LINCOS). The Costa Rican Foundation for Sustainable Development and the MIT have devised these digital community centers that allow village inhabitants to make constructive use of technological tools. From the outside LICONS look like small, easily transportable steel container. Connected to the rest of the world by satellite, they provide services such as post office, a small medical center, a big screen for videos, speakers for music, an information booth (for schools and business needs), tools for analyzing chemical and bacterial content of local soil air and water, etc.. The cost per center is around US$100,000, with most of the cost in training the human crew. So far there are seven LINCOS operating. Planned expansion into countries outside Costa Rica includes a project with the Banco Interamericano de Desarrollo, which intents to install 35 donated LINCOS units (www.digitaldividend.org/case_study_exp_temp.asp?name=25).

However, there is a lot more to the networked economy than what is nowadays considered as Internet access. Bridging the digital divide is not simply about giving people access to tools. It is about creating policy and regulatory environments, institutional frameworks, and human capacities that foster information flows, innovation, and effective use of the world's knowledge resources in every dimension of sustainable development, from health, agriculture, medicine and education to trade, economic development and effective governance (DSE, 2001). E-Readiness controls seem as a very useful tool to monitor and like this being able to moderate and support the transition to the digital age.

IV. The new performance: e-commerce

> "Broadly speaking, what society wants from producers of goods and services is good performance. ... Obviously it is not a new thing that performance is improving, but the shocking aspect is the speed in which it takes place and how deep and profoundly these improvements cut." ("From Industrial Economics to Digital Economics: An Introduction to the transition." pp.30, 38)

1. Introduction to electronic commerce in Latin America

The expansion of electronic commerce in the region can be seen as a barometer of the degree of implementation and actual use of the new tools. This enables to measure the progress achieved in the different sectors, with regard to the economic evolution underway in Latin America.

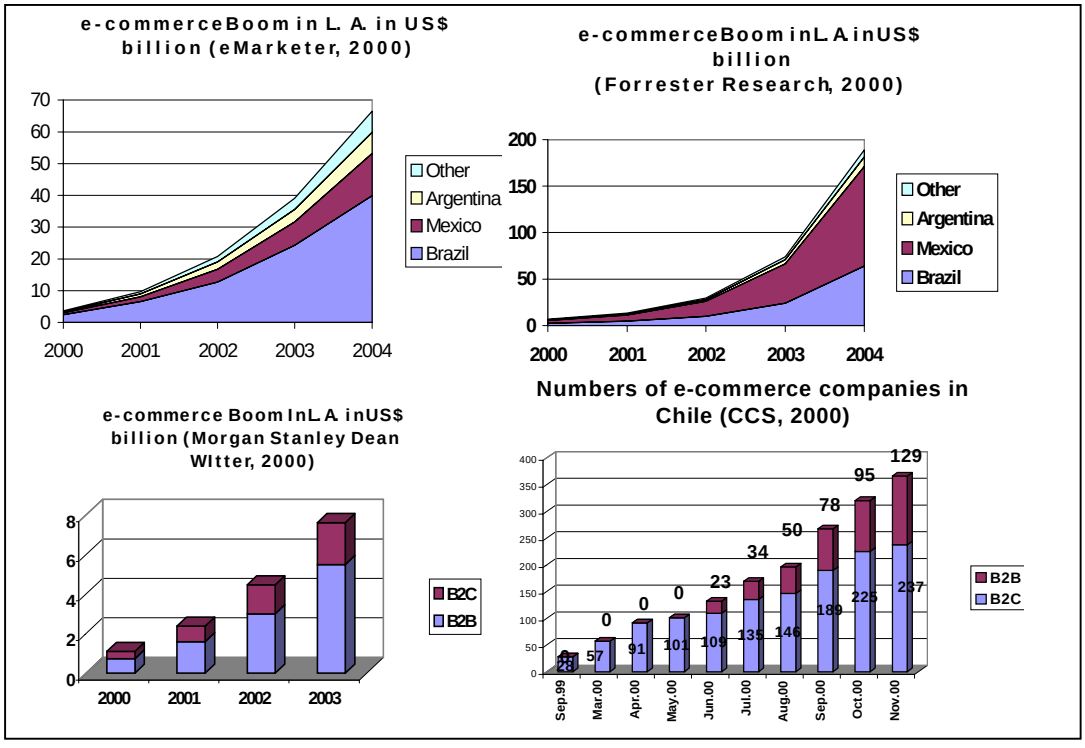
E-activities are usually divided into different segments:
There would be **B2B** (Business-to-Business), **B2C** (Business-to-Customer), **B2G** (Business-to-Government: often in the form of reverse auctioning), **C2C** (Customer-to-Customer: matching service online, private deal between the two parties), **G2C** (Government-to-Citizen: for example online tax paying), **P2P** (Peer-to-Peer: file sharing- like Napster), **B2E** (Business-to-Employee: Inner-firm management), **B2A** (Business-to-Affiliate: actually a kind of B2B, but specifically aimed at marketing purposes- promoting each other), **G2A** (Government-to-Administrator: B2E in the public sector), etc., etc..

Apart from this kind of classification, **ASP** (Application Service Provider) attracted major attention during last year. This implies to transform the Internet into a useful tool. ICQ or Napster would be two of the most successful applications of last year in Latin America. These two models succeeded in adding instant value to the Internet, which is not as simple, as can be observed with many B2C companies. ASPs are playing a crucial role in the transition to a digital economy, as outsourcing parts of the value chain by consulting an ASP is often the first step of "brick-and-mortar companies" towards becoming a "click-and-mortar company". After all, the greater economic impact in Latin America is expected as the traditional players make use of the new possibilities. And the incorporations of "clicks" into the "brick-and-mortar" framework already started in the region. IDC concluded in a recent survey for example that Latin American companies became even more enthusiastic about ICT applications outsourcing than their U.S. counterparts (IDC, 2001). ASPs provide ERP (Enterprise Resource Planning), CRM (Customer Relationship Management), supply chain management (SCM) or business intelligence (BI) solutions, GroupWare, vertical applications for specific markets, office programs, etc.. While in Europe 49percent of the companies consult ASP-services already, in Latin America the expenditure's for software have almost entirely been covered by medium- or large companies[69]. In Chile 93percent of the SMEs know about the ASP concept or have heard of it, but only 7percent use it (CCS, 2001).

The alternative of putting business negotiations online, just started in Latin America, but is explosively growing. In Chile the number of e-commerce companies almost ten-folded during 2000. Estimates about e-commerce proceed on assumptions which vary between a seven-fold (Morgan Stanley) until a 27-fold in volume (Forrester) between 2000 and 2004.

Figure 24

E-COMMERCE IS BOOMING IN LATIN AMERICA



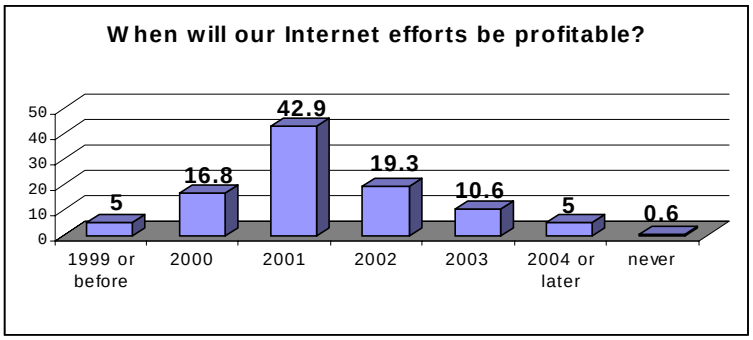
Source: eMarketer, www.emarketer.com; Forrester Research, www.forrester.com, MSDW, www.msdw.com; CCS, www.ccs.cl; 2000.

[69] According to the Camera de Comercio de Santiago, 89 percent of all the spending on software in Chile have been made by medium or large firms (micro: 1.6 percent), while 82 percent of the country are SMEs.

Of course, stages of development are different in different countries, and also in different regions of a country. Brazil, --especially São Paulo-- is accounted for being the ”powerhouse” (eMarketer) of Latin America’s Digital Economy, while countries like Chile started late, but are catching up quickly in their relative degree of development.

To get a general picture, it is worthwhile to consider a recent study of IDC (“Best Practices of Online Merchants: Volume I”, Dec 2000), where 161 leading e-commerce practitioners in six Latin American countries got interviewed. The split of the analyzed firms was fairly even between pure-Internet players and clicks-and-mortar companies in the survey. Nearly two thirds (65percent) of respondents said they expected their “Internet efforts” to be profitable by the end of 2001.

Figure 25
SURVEY OF LATIN AMERICAN 161 E-COMMERCE PRACTITIONERS



Source: IDC, 2000; http://www.idc.com.

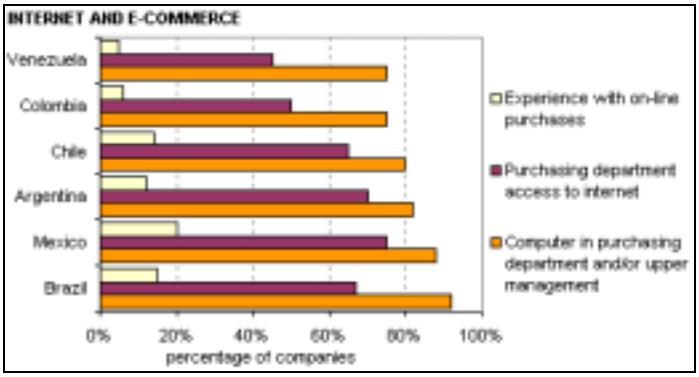
Like all over the world, there is also a **consolidation process** expected in Latin America. The supply grew faster than the demand for the new services and business models of many players did proof to not be sophisticated enough. But this is a normal phenomena of economic development, and usually does not hinder the growth of markets. Around the year 1790 there have been 600 stock markets in Manhattan; nowadays there are two main exchanges left. Nevertheless, trade did not decline since then. Out of the 2000 car firms in the U.S., there are only three left nowadays, but the automobile market in the U.S. has definitely not shrunk (Hilbert, 2001a). In March 2001 the Chilean Chamber of Commerce concluded following general characteristics for failed Chilean Websites: they offered only few products, never made publicity for their site, and therefore there has never been market positioning, pages are static, they are slow, no efficient distribution systems are implemented and no payment system gets offered (CCS, 2001). It is not a secret that the lack of a serious business model and half-hearted implementation are the main reasons for failure, also in Latin America. A recent report of the Boston Consulting Group stated that in a test of 118 e-commerce sites in the region, almost half did not respond to email inquiries and 42percent of goods ordered arrived later than their promised delivery date. Surely performance of many Latin American players needs to improve if e-commerce wants to succeed. Looking at it from this historical and sober angle, the “high failure rate” of e-commerce start-ups does not really give reason to worry (see also Chapter V).

It is estimated that the **connectivity** of Latin American **companies** lies around 50 to 70percent. The Cámara de Comercio de Santiago indicates that 60percent of Chilean companies have been connected in March 2001 (excluding micro-enterprises!) (CCS, 2001). According to a survey of 400 companies in Argentina, by the consulting firm Prince & Cooke, 86.8% of small- and medium-sized enterprises (SMEs) have Internet access in the country. Other findings also indicate that SMEs and large businesses are well represented online. An InfoAmericas survey conducted in

March 2000 showed that more than 80% of medium-sized companies in Mexico and Brazil have at least one person with access to the Internet. By the end of 2001, Prince & Cooke predicts that nearly all companies with 200 or more employees will have a Web site and nearly ¾ of SMEs will have an online storefronts. In addition, businesses are increasingly using the internet both for procurement of goods and services as well as a sales channel. InfoAmericas estimates that just over 80% of Argentine companies have a computer in purchasing department and/or management. Approximately 50-70% of purchasing departments have internet access, but figures from InfoAmericas show that only 10% have actual experience with e-procurement, while Prince & Cooke estimates that around 20% of SMEs and large businesses have bought goods online. According to the "Federación de Industrias del Estado de São Paulo", in its local market, only about 4percent of the companies realize B2B transactions through the Internet, while 83percent use e-mail for their negotiations. This can be seen as a normal process of adoption. In North America, only 16percent are taking place in some kind of e-marketplace until now, and 43percent are planning in doing so the next two years to come (LehmanBrothers, 2000). Having a general feeling about magnitudes in the market, it is expected that in the near future companies in Latin America will use the new possibilities more efficient on a larger scale, quickly catching up with their northern counterparts.

Figure 26

COMPUTER AND INTERNET PENETRATION IS RELATIVELY HIGH BETWEEN LATIN AMERICAN COMPANIES



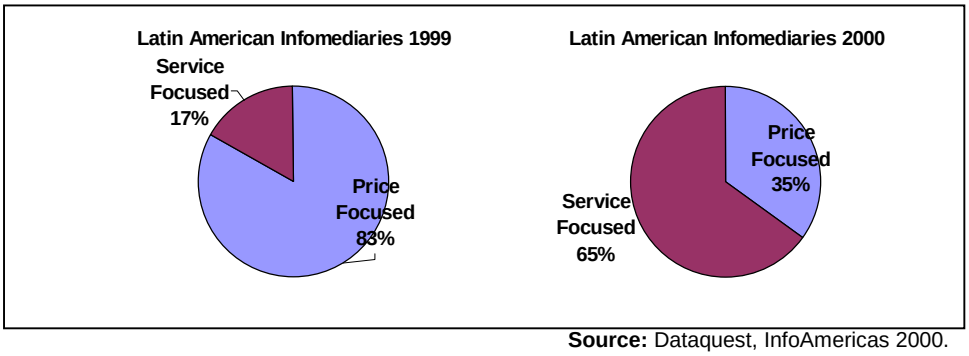
Source: http://infoamericas.com/Tendencias/General/0300/0300.HTM .

At the beginning of 2000, only 15 percent of the Chilean companies had their own Web-page (13percent of the micro-, 24percent of the small-, 33percent of the medium sized-, and 46percent of the big companies). Nevertheless 64percent are using email for commercial contacts (CCS, 2000). Observing the trends in developed countries, it is expected that the vast majority of companies will first start to buy online, while only a few pioneer companies will be selling. Looking at these numbers is underlining that the transition from industrial to digital economics is not about technological change. Lack of understanding and comprehension is the major obstacle. Vendor marketing efforts in Mexico during 2000 were somewhat successful in educating businesses about enterprise applications, but more extensive education campaigns --especially those targeting small and midsize companies-- are necessary in 2001 before strong revenues are realized. According to IDC, approximately 52% of all Mexican companies (micro, small, medium, large) are not familiar with enterprise resource management (ERM) applications and nearly two-thirds are not familiar with supply chain management (SCM) or business intelligence (BI) applications. In addition, almost 70% of all Mexican companies are not familiar with the powerful customer relationship management (CRM) (IDC, 2001).

Typical for an economy in transition, first of all traditional business focuses get transmitted to the web. 94percent of the goods traded online in Argentina in 1999 have been non-digital goods (CACE, 1999). This proportions are of course expected to change rapidly, considering the benefits from trading digital goods (see Hilbert, 2001a). Very rapidly online business models get more and more sophisticated. The graphic below shows how Latin American Infomediaries (for a closer discussion about the model of infomediation see: Hilbert, 2001a) shift from just focusing on shrinking distribution margins and selling on the strength of low prices to add substantial value to their services, exploiting more and more the full possibilities of infomediation and learn how to manage content.

Figure 27

COMPANIES ARE QUICKLY ADOPTING ADVANCED APPLICATIONS AND SERVICES



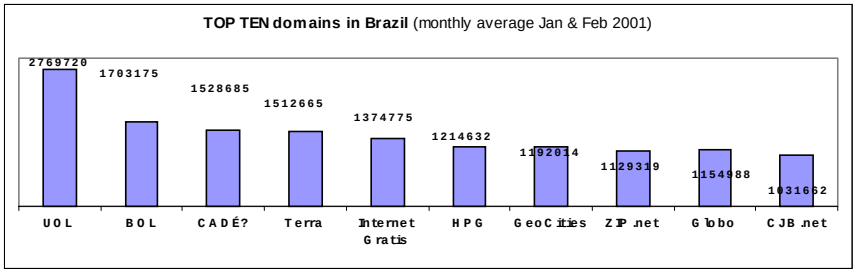
Source: Dataquest, InfoAmericas 2000.

2. Portals and content

The term “portal” is usually used as a marketing term to describe a Web site that is (or is intended to be) the first place people reach when entering the Internet. Methodologically it is situated in the third layer of Internet Economics (see Hilbert, 2001a) and is seen as a rather indirect, but very influential component of e-commerce, due to their funneling and distributing functionality. Typically a “portal site” has a catalog of web sites, a search engine, it offers free email and other services (ranking from stock market news to horoscopes) which allow them to create and generate as much traffic through their site as possible. Portals do not necessarily be combined with an ISP (like with AOL, TerraLycos, StarMedia) or a browser (Netscape, Microsoft Explorer), but this is often the case. This is partly due to the fact that many ISPs make use of configuring their portal on the installation disc by delivery, which comes in very handy for the provider, as estimably 90percent of the online surfers do not change their initial page (or do not even know how they could). The most visited Internet Portals in Latin America are StarMedia (Cade in Brazil), Terra, ElSitio and Universo Online (UOL), whereas the last one is more specialized on Portuguese content, and is often penetrating more than 60percent of the important Brazilian market.

Figure 28

NAMES AND NUMBERS OF BRAZILIAN PORTALS



Source: Ibope, 2001, www.ibope.com.br/eratings/links8.htm.

Naturally, portals mainly finance themselves through advertising. ElSitio raised US$7.7million of its US$13.2million of last years budget this way[70] (EIU, 2001). Coming to advertising, the so-called "**pan-regional**" model is playing a crucial role in Internet Economics. A pan-regional campaign is possible due to some basic characteristics such as language, religion, type of government, and geographic proximity that these countries share, as well as some more complex demographics and psychographics. Even though many foreigners are shopping on US sites, for example, a clear lack of "globalization" of US Websites is observable. Neither language nor content is getting translated to serve the different customer groups[71]. While US companies often compensate this lack easily with a wider product selection, many Latin American companies integrated country specific tailor-made attention directly into their business-strategy. The big players of the region (like StarMedia, UOL, ElSitio…) do not treat the entire Latin American market the same. Users may often select from more then 10 different countries of the region. While more efficient price discrimination might be part of the reason, also cultural differences demand the pan-regional model. Contents might naturally often be related (as the market and focus of interest itself), but especially between big countries of the region, the tailor-made attention can not be denied and is serving its purpose to bind customers. StarMedia, Latin America's largest portal is furthermore pursuing a strategy where it is buying local sites, but retains their original names, with their "look and feel", which has brought important traffic and the ability to sell country-specific advertisement. In order to acquire regional content portals are often purchasing or developing partnerships with large regional "brick-and-mortar" content provider. Terra, for example has been successful in attracting media groups such as Grupo Copesa in Chile (La Tercera, La Hora, La Cuarta, Que Pasa, Radio Zero, Radio Oasis) or Grupo Estado in Brazil (Jornal da Tarde and O Estado de São Paulo) (EIU, 2001). As local content is expensive, and time-consuming to produce, large global player, such as Altavista or AOL do have to fight hard for every little piece of Latin American market share.

Content became one of the most important catchwords in Internet Economics recently. "Content is the formal 'written down' expression of knowledge capital. … It is 'the' key resource – the key way that knowledge capital is expressed" (McGovern, 2001). In 2000, on average unique visitors spent the longest amount of time on Pogo.com, an online game service (175.8minutes; 2nd eBay: 117.3minutes; 3rd iWon.com 94.2minutes) (eMarketer, 2001). This is emphasizing how quality content does serve its purpose in cyberspace. Argentina[72] is now the largest producer of Spanish-language content on the Internet (eMarketer, 2000a).

While Chile is generally accounted for having the second most Webpages per inhabitant in the region[73] (after Uruguay: 9.8; Chile: 8.43; Brazil: 5.43; Argentina: 4.38; Mexico: 4.16; Venezuela: 1.33; all 1998 (ALADI, 2000)), a recent study of the Universidad de Chile is showing that almost 52percent of Chilean Web sites comprise just one single simple front page, mostly showing an e-mail address and some text. Just half of Chile's "punto-cl" domains used to update Web pages last year and Chile's 100 largest Websites hosted one third of the country's pages (Nua, 2001). In Uruguay, the highest connected country of the region, only 48percent of the companies operating online provide the prices of their products and services (EIU, 2001). The content of Latin American sites is still of low sophistication, often only serving a promotional goal, but not allowing more efficient use of the new possibilities, like transactions. Using the network of networks like a traditional information-distributing tool does of course hardly bring the desired economic advances.

[70] Other US$5.1million from connectivity and US$0.41million from e-commerce (EIU, 2001).

[71] "If I'm selling you something then I speak your language, if I'm buying something then muessen Sie Deutsch sprechen (you have to speak German)." Willy Brandt, German Bundeskanzler 1969-1974.

[72] 88percent of the pages which get opened in Argentina are in Spanish, 9percent in English and 0.6percent in Portuguese (www.cace.org.ar/cace_stats/ejemplos.asp).

[73] Please note that these numbers are per inhabitant of the "real world", not about inhabitant participating in cyberspace!

3. B2B

When analyzing the networking between companies, first of all the role of the Macro has to be considered. Just in recent years, with the greater economic stability (like lower inflation), it also made sense for small and medium sized companies to consider technical innovations as an effective and decisive tool. However the Micro might traditionally stand in the second row, its power and impact, especially considering the dynamics of today, is paramount. Intra-industry trade by Latin America has increased rapidly in the 1990s. For the eleven Latin American Integration Association (LAIA) member countries[74] intra-Industry trade reached US$ 139billion in 1998, which accounted for 26percent of the region's trade. Close to 43percent of Mexican trade can be characterized as intra-industry (Kuwayama, 2001). Putting this kind of commerce online, decisive savings can be obtained in the incoming, as well as in the outgoing value chain (in product purchase through transparence, product storage through reduced inventory, process rationalization through better timing, better allocation of resources and products, etc.). A recent report from the Aberdeen Group (Aberdeen, 2001) shows, for example that electronic procurement reduces purchasing costs and time by more than 70 percent, comparing the results of their research conducted in Nov. 1998 and Nov. 2000. Aberdeen estimates that an average midsize organization can expect to save almost $2 million per year through automation in process and product costs. In contrary to the estimated 10-20percent savings obtainable through bulk buying by an online intermediary (which is just a shift in income from suppliers to buyers), the first form of saving represents a permanent gain in productivity (The Economist, 2000). The OECD cites a B2B example from the US Automotive Industry Association Group (AIAG), which generated a 58percent reduction in lead times, a 24percent improvement in inventory levels and a 75percent reduction in error rates (OECD, 1999). Combining the importance of intra-industry trade in Latin America, with the cost saving obtainable through B2B, a decisive productivity rise is expected once Latin American companies should put their business-to-business commerce online.

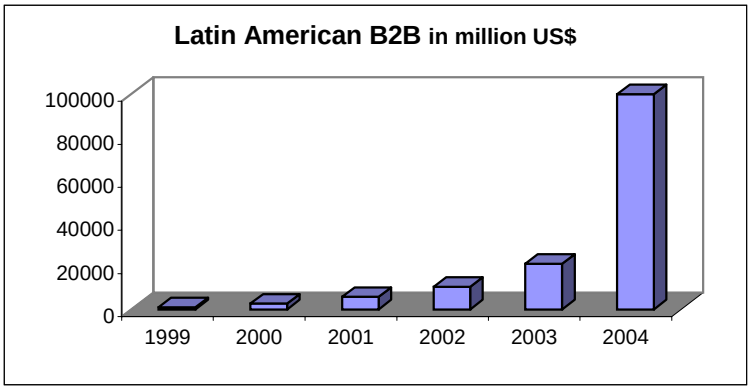
Until now B2B is still only a small proportion of total transactions between businesses (1.5percent in Brazil in 2000[75] (Symnetics, 2000)). However this way of conducting business is explosively getting adopted throughout the region. It is expected that almost every fifths inter-business transaction will be made online in Brazil in 2004. The Latin American B2B site SeNegocia.com (Argentina, Chile, Peru) claims to make a quotation every 7 seconds and every 8 minutes a new client is getting subscribed[76]. Looking at a cross section of (highly varying) estimates, it is generally anticipated that B2B volume in the region is doubling every year, until it will take of after 2003.

[74] Argentina, Uruguay, Mexico, Peru, Colombia, Paraguay, Brazil, Venezuela, Ecuador, Chile, Bolivia.

[75] Which is actually an amazingly high penetration, considering the only recent introduction of this business model in Latin American countries.

[76] How quick Latin American companies adopt new models can be observed by the dynamics in the outsourcing sector. Large implementation costs and additional maintenance responsibilities were the original barriers to applications like e-procurement. But this has been changed with the arrival of hosted procurement solutions, which allow smaller organizations to benefit from Internet purchasing automation. As professional application outsourcing did hardly exist until recently, it is nowadays among the region's fastest growing segments of ICT services (IDC, 2001). Companies which are offering specific applications, as well as complete business solutions (from voice portal until logistic tracking) are sprouting across the region.

Figure 29
LATIN AMERICAN B2B TAKING OFF AROUND 2004



Source: Martin Hilbert, 2001.

Measurement problems show up again, when considering absolute numbers (traditional EDI (electronic data interchange[77]) network vs. web-enabled EDI system, deal via telephone while info via Internet… . What counts for B2B e-commerce?).

It is by long no secret anymore that the driving force of Latin America's online trading will be the business-to-business (B2B) e-commerce in the years to come. Here estimates suggest that the B2B segment will account for up to 93percent of total growth in Latin American e-commerce (US Department of Commerce, 2000). Many factors are contributing to this. Between others there would be the relatively high access penetration between companies. Infoamericas is estimating that 50-70[78]percent of Latin America's mid-sized companies purchasing departments have access to Internet (Infoamericas, 2001a). This makes still clear that the B2B segment does have extreme advantages over a B2C segment, creeping around 2-6percent connectivity of their potential clients (depending upon the market). Also the volume of single transactions are a lot higher in B2B, comparing it to B2C. The international competitiveness pressure and a herd-effect, as well as the fact that often buyers switch to online purchasing because their traditional supplier modernized first --leaving them with not too many alternatives-- are other factors contributing to B2B pre-eminence. Actually the first heavy users of B2B services in the region, have been large, globalized Transnational companies[79]. Last but not least the fact that B2B is often standing with one foot in the powerful "bricks-and-mortar" world and is mainly pushed as the "old-economy" is discovering the new possibilities. Like this B2B e-commerce constitutes the lion-share of online commerce revenues in Latin America: 80percent in 2000. Its share is even expected to increase in the years to come: 88percent in 2004 (eMarketer, 2001a).

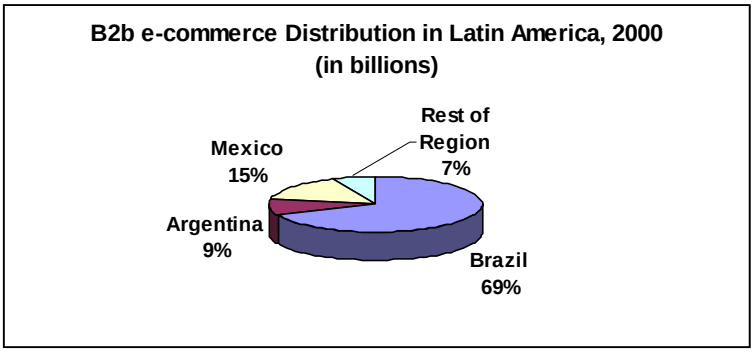
According to eMarketer, Brazil's booming B2B segment accounted for 69percent of total B2B e-commerce in the region. This would represent 54percent of the all e-commerce revenues in 2000, estimated by the same defintions (eMarketer, 2000).

[77] For an explanation of the EDI system see the footnote of the following page.

[78] The numbers for CHILE, for example have been in December 1999 (!): Micro: 37%; Small: 64; Medium: 81%; Big: 93%. Leaving a total of 42% (CCS).

[79] The best examples include Volkswagen's plant in Argentina, Brazil, and Mexico that use the Internet to link their suppliers, as does the Argentine oil firm YPF (Kuwayama, 2001).

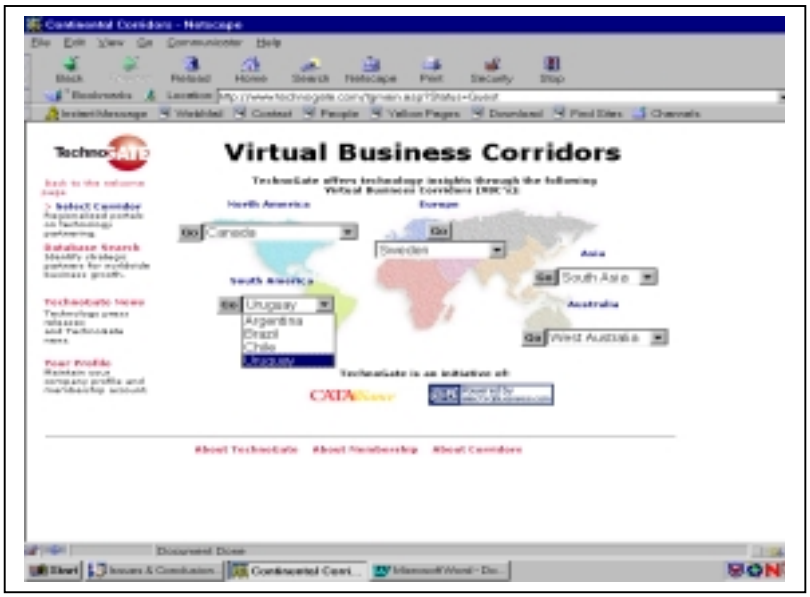
Figure 30
BRAZIL IS LEADING LATIN AMERICAN B2B



Source: eMarketer 2000; http://www.emarketer.com.

A first, rather simple, but highly effective model of how businesses are networking, would be an application called "**virtual business corridors** (VBC)". These corridors are set up to increase the information flow between businesses themselves and between businesses and markets, often on an international level. A very vivid example is "Technogate". With funding from the International Development Research Centre (IDRC), this VBC is the result of a collaboration between business associations in Latin America and the Canadian Advanced Technology Alliance (CATA). The project is intended to help Latin American industries to enhance business communications, increase their level of collaborative research and development, and to promote strategic alliances and partnerships. The Technogate's VBCs lead directly to the doorstep of other companies in Latin America or the world (idrc, 2001).

Figure 31
SUPPORTING INTERNATIONAL TRADE



Source: Technogate, 2001; http://www.technogate.com.

The software cannot make deals happen, but it is surly a case in point for the networked economy. It is easy to find a like-minded company, instead of searching for a needle in a haystack by going on expensive trips and through obscure channels of worldwide personal relations.

Text box 3
VIRTUAL BUSINESS CORRIDORS

The European Union has been running a project during 1995-1997, called "Information system on the Community Market for the Chilean fruit-farming industry". The main goal of this project was the setting up of an Information system on fruit-farming for European markets to provide the background necessary for Chilean fruit-farmers, in order to interpret market behavior and its export-related variables, and like this to acquire the knowledge of the different variables involved to maximize their fruit exports, such as: local prices, volumes, quality, seasonality, shipping requirements, distribution channels, EU market demand, overall import requirements, taxes imposed, price competition, etc (EU, 2000). The project makes "effective use of advanced ICTs, and engenders clear benefits to the Chilean economy. The project has a positive impact on trade between Chile and the European Union" (EU, 2000). Another EU project, called "fostering SME exports in Peru", set up a corridor to provide market information (such as duties, prices, transportation costs, etc.), including support, to European buyers. The final report of the project is claiming that "while the companies involved in the project experienced an increase of 14.7percent in their exports, total non-traditional exports fell by 9.1percent during the same period (Jan-Sept 1999)" (EU, 2000).

Source: EU, Information Society & Devlopment: Review, 2000.

An example of a private intermediator would be for example Grower2Buyer (www.grower2buyer.com). The idea is the simple infomediation between the flower export industry in the Andes to wholesale buyers in the U.S.. Channels like this are suddenly giving the single growers control over their market (who is buying? When? What price? What varieties are in demand? Where in the U.S.?), while they have been blind before. Asymmetries of information and misallocation of resources get reduced at both sides, and all the additional values of infomediation get introduced.

More methodologically speaking, the last 12 months have seen announcements referring to B2B Web sites as e-marketplaces, digital markets, trading communities, trading exchanges, virtual distributors, demand aggregators, lead generators, channel enablers, procurement portals, vertical maintenance, repair and operations exchanges, etc., etc.. It is enough to cause vertigo. We could divide them in three main categories (IDC, 2000):

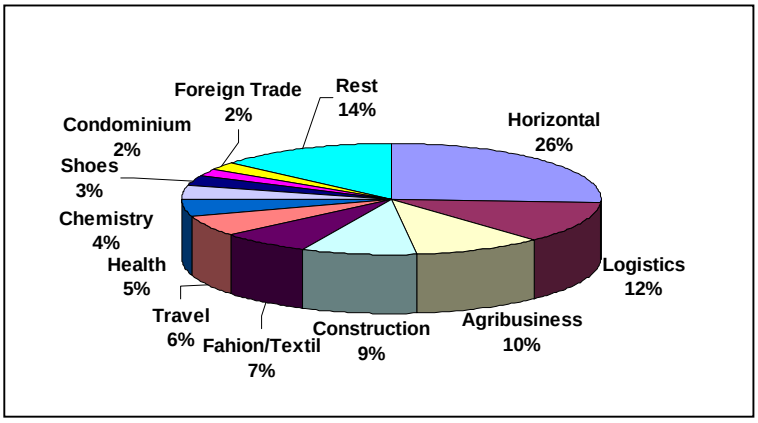
- e-Procurement (many suppliers, few purchasers in a trading community)
- e-Distribution (many purchasers, few suppliers in a trading community)
- e-Marketplace (many suppliers and many purchasers, and a neutral platform provider)

The last category is the least common until now, but expected to capture more than half of all the B2B transactions by 2004 (IDC, 2000). Which kind of B2B model is most likely to be used, depends highly on the market structure or the degree of product norms and standardization. Markets which rather deal with highly standardized goods or services (like office supplies[80], construction, etc.) naturally face lower hindrances, than markets where the traded products highly depend on the individual case (like entertainment, or food, etc.), and therefore the purchasing party rather relies on few, well-known suppliers (e-Distribution). Coming to the market structure, in general, in heterogeneous markets (like agribusiness, health, transportation, etc.) e-marketplaces are obviously more effective, than in markets with a firm oligopoly structure, like automobile, steel,

[80] Office Supplies turned out to be a very successful business in Latin American B2B (Like OfficeNet, OfficeMax, Office Depot, DeCompras.com…). Forrester Research is predicting that office supplies will constitute 24percent of the regions B2B by 2004.

oil, gas, mining, etc., which leave little space of independent initiatives and rather conduct their inter-business transactions via secure EDI systems[81].

Figure 32
PORTALS PER SECTOR (BRAZIL 2000)



Source: Symnetrics, 2001; http://www.symnetics.com.br/.

Like the following graph is showing, the number of companies which have already subscribed in B2B sites is a lot higher than the number of companies actually making use of this subscribtion (see Figure 33: middle column (actual opportunities) vs. left column (signed up companies) = usually less than 20percent).

It is easy to subscribe, even to make orders online and to process them. But the complete incorporation into the firm structure, the professional implementation of the fulfillment, delivery and clearing, is bringing demanding obstacles with it, as practice shows. While substandard networks and high investment costs can partly be blamed for the delay to adopt new information technology, much of the resistance may also be habitual. The problem is the distrust between companies, which only know each other "virtually". Long established business relations are hard to be replaced in a culture which is established as much on "personal ties", as in Latin America. While several organizations (like Chambers of Commerce, Mercosur.com…) are working on this problem by handling out certificates which are "brandmarking" and classifying companies and products, it still remains a change in attitude. Another problem for Latin Americas B2B companies is the verification and concession of **credits** and the process of **financial transactions** at all. Banks already started to work on some solutions, but the development of an integrated process is expensive, complicated and needs its time. Part of the problem is that every market is having its

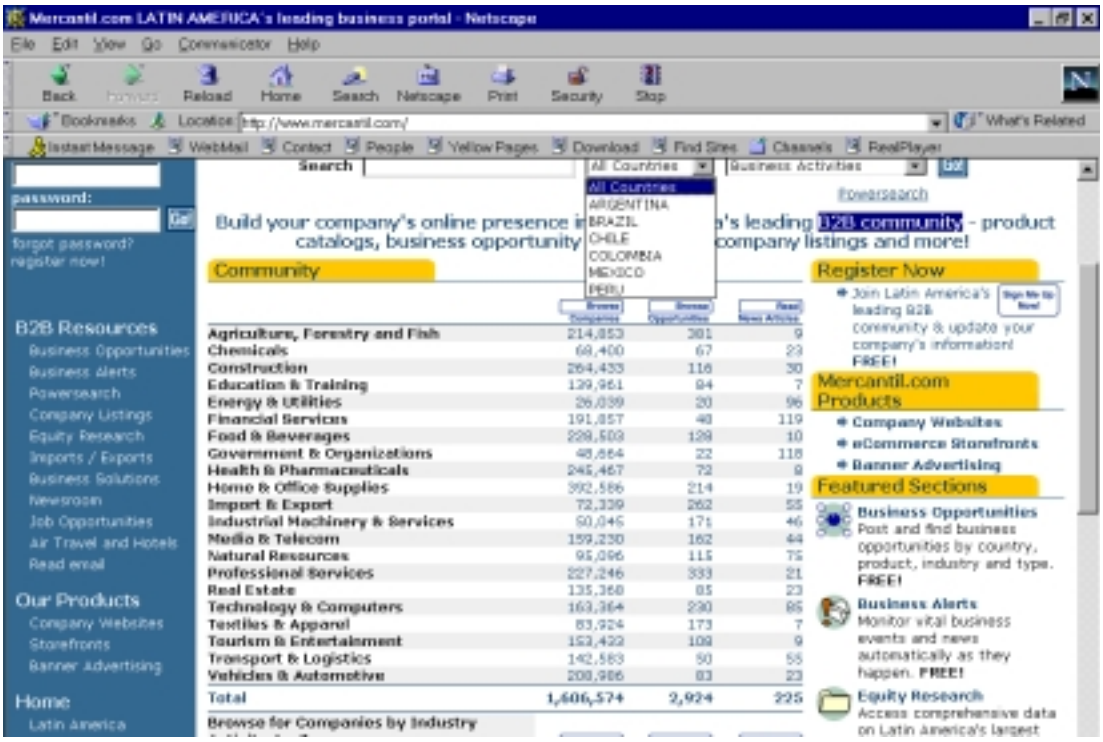
[81] The first generation of supply chain electronic commerce involved proprietary **EDI** transactions that were developed between industry segments of trading partners. Generally these partners were large companies who were early adopters of the technology, capable of making the necessary economic investment, and able to prove the business case for the technology. This first generation generally required that all trading partners connect to the same proprietary network and maintain their own internal systems based on a set of contractual agreements. Over time these agreements formed the basis of what would be considered 'industrial grade' for business to business electronic commerce solutions. As more industry segments began to realize the value of EDI there was agreement that the transaction sets must be standardized and organizations like the American National Standards Institute (ANSI), and the International Standards Organization (ISO) took up the burden of the work. This allowed different networks to interconnect with one another and extended the scope of EDI globally (Gilbert, 2000). We could say that Internet Protocol (IP) is the standard for Internet based electronic transactions. The IP standard is widely spread and made it possible to reach such a high penetration and importance as a basis for e-transactions. Nevertheless, its availability and openness makes it often suspicious for fraud, in comparison to "closed" EDI systems.

own terms with regard to payment periods, discounts and the like. One solution would be the use of virtual credit cards, but until now there is no general standard found[82].

Figure 33

HIGH NUMBER OF SUBSCRIBTIONS- LITTLE ACTIVITY IN LATIN AMERICAN B2B UNTIL NOW

NUMBERS of COMPANIES subscribed in Mercantil.com (B2B site for SMEs in Latin America) **per sector**



Agriculture, Forestry and Fish	214,853	381	9
Chemicals	68,400	67	23
Construction	264,433	116	30
Education & Training	139,961	94	7
Energy & Utilities	26,039	20	96
Financial Services	191,857	48	119
Food & Beverages	228,503	129	10
Government & Organizations	48,864	22	118
Health & Pharmaceuticals	245,467	72	9
Home & Office Supplies	392,586	214	19
Import & Export	72,339	262	55
Industrial Machinery & Services	50,045	171	46
Media & Telecom	159,230	162	44
Natural Resources	95,096	115	75
Professional Services	227,246	333	21
Real Estate	135,360	85	23
Technology & Computers	163,364	230	86
Textiles & Apparel	83,924	173	7
Tourism & Entertainment	153,422	109	9
Transport & Logistics	142,583	50	55
Vehicles & Automotive	208,986	83	23
Total	1,606,574	2,924	225

Source: Mercantil, 2001; http://www.mercantil.com.

As with all e-commerce sectors, there is also a profound **consolidation** of the Latin American B2B market expected. Additionally to the many start-ups, which have been sprouting during the last year in the region, Forrester Research investigated that 90percent of all US marketplaces are planning to start operation in the region before 2002. Reaching the famous "critical mass" will be decisive. The experience shows that the critical mass needs to reach such dimensions that, besides the usual income source of a B2B company --a commission on transactions made-- other income sources can be called on.

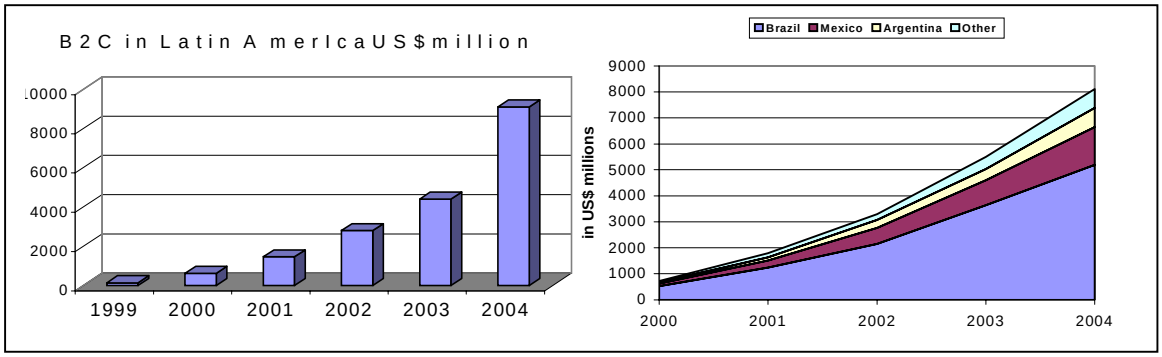
After all, most of the "big players" in Latin America did not yet enter the markets. It is expected that the dominating firms of each sector --which have only been observing until now--, will implement their plans during 2001. Great dynamics are expected here, as attitudes change quickly and obstacles get overcome fast, if lucrative business is beckoning.

[82] The brasilian portal Webb, for example (working in the automobile-, chemical-, paper- and health sector) lauched a virtual credit card, exclusively for purchases on its site. It was developed together with Bradesco and Visanet and enables purchases between sellers and buyer up to a prepared amount (punto-com.com, 2000).

4. B2C

Even though, when comparing B2B with B2C, the later mentioned is making up the smaller percentage (20 to 30percent in Latin America right now), looking at it in relative terms, this segment is booming as well.

Figure 34
B2C E-COMMERCE IN LATIN AMERICA

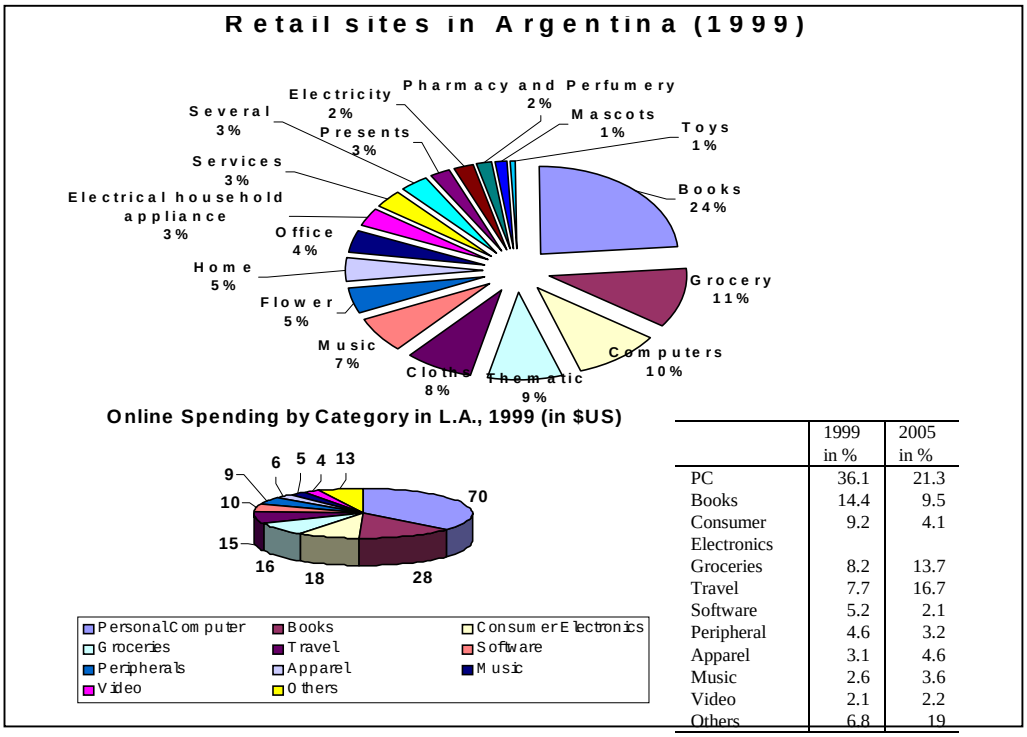


Source: Martin Hilbert; eMarketer 2000 .

These numbers represent the total of B2C e-commerce in the specific countries, which is including the sales of domestic, as well as foreign e-tailors.

So what are Latinos shopping for over the Internet?

Figure 35
WHAT B2C CUSTOMERS ARE SHOPPING FOR IN LATIN AMERICA



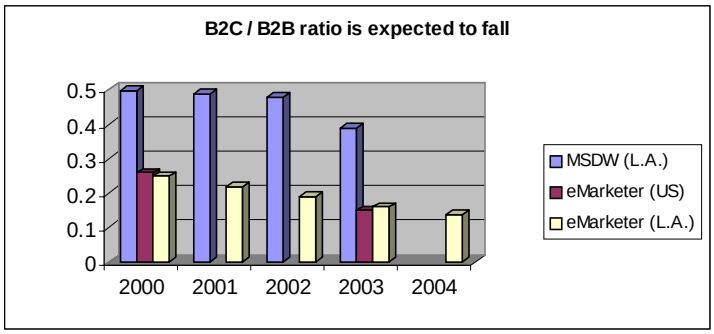
	1999 in %	2005 in %
PC	36.1	21.3
Books	14.4	9.5
Consumer Electronics	9.2	4.1
Groceries	8.2	13.7
Travel	7.7	16.7
Software	5.2	2.1
Peripheral	4.6	3.2
Apparel	3.1	4.6
Music	2.6	3.6
Video	2.1	2.2
Others	6.8	19

Source: CACE (Cámera Argentina de Comercio Electónico) 1999; Jupiter Research, www.jup.com/company/pressrelease.jsp?doc=pr000215.

Looking at the graph of Argentina (especially in 1999), it needs to be recalled that every kind of retailing is always also reflecting the macroeconomic conditions of a country, having impacts on the amount and the selection of goods and services bought. Jupiter estimates that while the industries of personal computers, books and consumer electronics might still be leading the online-way, travel and grocery will intrude the market significantly in the years to come (Jupiter, 2000). But due the small size of the emerging B2C segment these numbers can highly depend on individual initiatives. There is for example the example of Netkiosk.com.ar, a successful business model in Argentina. Since 1998 the company is providing public access places, similar to "the kiosks at the corner" and like this contributed to facts like that event tickets reached one of the biggest shares of anticipated online purchases (58percent) in the country (American Express, 2000).

Comparing business-to-business with business-to-consumer e-commerce directly, it is expected that in relative terms, B2C e-commerce will constantly become a less important role.

Figure 36
B2C VS. B2B



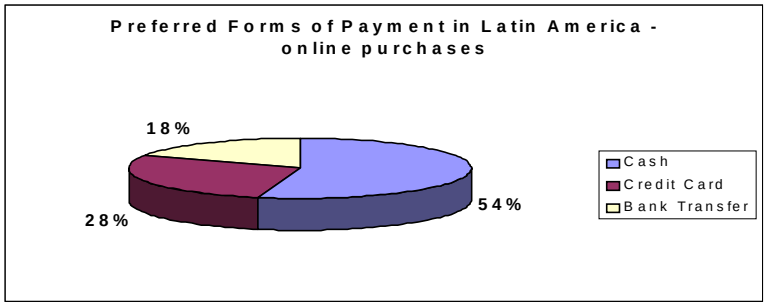
Source: MSDW, www.msdw.com; eMarketer, www.emarketer.com;

While this is mostly reflecting the extreme speed, companies are getting connected and are putting transactions online, on the other hand the low --and even falling-- participation of private customer in e-commerce is reflecting many of the obstacles B2C is facing and therefore "hindering its growth". In Latin America, low credit card penetration, low access penetration, and high access costs, as well as poor infrastructure and parcel delivery systems are all contributing.

One of the most lamented obstacles for Latin America's B2C segment is the low **credit card** penetration of the region. The total transaction volume of the "plastic money" is increasing fast, but is starting from low (in 2000, Visa Brazil expects to reach a total transaction volume of US$12.5billion, which would represent a 44percent jump on 1999's US$8.7billion). While in the U.S. 1.8 cards per person can be found (eMarketer.com, 2000), only 18percent of Brazilians hold credit cards (Mexico: 12percent, Argentina: 35percent[83] (infoamericas, 2000a)). Online companies are adapting to this situation by offering different kinds of alternatives. In contrary to their North American counterparts, most Latin American online retailers accept cash payment. According to a recent study this alternative is also the most popular (infoamericas, 2000).

[83] In entire Ecuador for example there are only an estimated 30,000 credit-card holders (population around 12.5million). About 2.8m people have checking accounts. The model for national e-commerce in the short term will therefore require the use of debit cards (EIU, 2001).

Figure 37
RETAILER ARE ADAPTING TO THE SPECIAL CHARACTERISTICS OF THE REGION



Source: D'Alessio/Harris Argentina, e-Conomia Digital, cited infoamericas, 2000

Banks already started to work on solutions like prepaid debit cards and other mechanisms for privately transacting business online. In general prepaid devices (like chip-based smart-cards) are expected to become the new standard in the region. These solutions, which aim at bypassing the low credit card distribution, will be necessary once a greater part of the lower classes is getting connected. For now Internet access and credit card possession soar up hand in hand with increasing income, and therefore are not often hindering each other[84]. For example, an unusually high 92 percent of households using StarMedia have at least one credit card (eMarketer.com, 2000).

What is hindering already, is the lack of trust, stemming from a considerable recent history of credit card fraud, especially in Brazil. InfoAmericas stated that two-thirds of Latin American credit card holders are reluctant to use them, due to the lack of trust. Here investments in more secure payment technology would seem worthwhile immediately.

There are also many technical failures in the young Latin American market, which is crowded with **inexperienced and inept retailers**. According to ebusinessforum, Latin American consumers must click an average of 11.4 pages (by contrast to 5.5 pages in the US and 6 in Europe). This hurdle is contribution to an abandonment rate of shopping carts of 92percent (US: 78percent, Europe: 84percent) (ebusinessforum, 2000). The vast majority of Latin Americans online consumer segment is from higher income groups, who expect a high level of service and efficiency. Therefore Latin American online retailers need to improve their product selection, customer service capabilities and on-time delivery performance in order to be able to satisfy this high expectations. Out of 118 sites tested in a survey last year, 52 did not respond to e-mail inquiries. In addition, 42 percent of goods ordered arrived after their promised delivery date (BCG, 2000). The logistics sector in Latin America, which is comparatively small, often poorly equipped and lacking sophistication is another major obstacle for the regions B2C. In most countries the national post office still dominates internal small packet distribution. However, local companies are springing up to meet demand: Estafeta in Mexico, InterCouriers, Total Express in Brazil or NetEnvios in Argentina, are good examples. Only in Mexico has a multinational company --United Parcel Service (UPS)-- taken a significant market share of internal package distribution.

This kind of problems in performance is also getting reflected in the **loyalty of customers**. Only 6.7% of Latin American clients are regular customers compared with about one-third of US online shoppers (infoamericas, 2001). As an old business-wisdom goes: getting steadily new customers does not make rich, if you do not hold the old ones. Ignoring this, heaps of money got spend last year on television, billboard, print and online advertising almost randomly, without

[84] Among upper income citizens (those in the A, B, and top half of middleclass strata), credit card penetration rates are 37percent in Brazil, 94percent in Mexico, 96percent in Argentina, and 41percent in Chile (eMarketer, 2000). But note Brazil, where the connectivity of these classes is around 50percent..

seeming to aim at a specific focus group. This drove up on-line traffic, but not sales, and therefore per-customer costs exploded. Marketing costs per customer attracted reach US$ 219 in Latin America, in sharp contrast to US$ 97 in the rest of the world (infoamericas, 2001).

But also **cultural and habitual reasons** are listed when searching for reasons for low B2C e-commerce. North American shoppers are used to ordering through a catalogue (the so-called "Sears-shopping-culture"). Also in Europe people do have experience with this way of retailing (e.g.: Quelle in Germany). Therefore B2C is accounted for great acceptance for this group of customers, while in Latin America it seems to be a strange idea for many people, to buy something by just having a look at some pictures or data.

The model of eMarketer assumes that Latin American Internet **buyers spend** an average of US$41.35 per month over the period 2000-2003, or roughly US$500 per year. The average purchase amount per user is supposed to stay virtually constant because, although experienced users spend more over time, online newies tend to spend proportionally less, bringing the average down. Of course also here, estimates of how much Latin Americans spend online vary, in part due to differences in methodology or in different definitions. For example those advanced Internet users who respond to IDC's Project Atlas survey reported spending US$58 per month via Internet, -- varying from US$55 per month in Brazil, to a high of US$ 76 per month in Argentina-- while the Cámera de Comercio de Santiago is expecting US$ 35 per month for 2004 in Chile. StarMedia statistics on the purchasing habit of its users, collected through a survey conducted in December 1999 and January 2000, show spending levels of US$635 per year. Of StarMedia users, 43 percent made a purchase online within the previous 12 months. But the StarMedia sample represents only one advanced segment of Latin American Internet users (eMarketer.com, 2000).

Like with all B2C markets all over the world, there is also a profound **consolidation process** expected for Latin America's online retailers. After the fall of the Nasdaq in 2000, it became clear that there is not enough pie for everybody. Too many start-ups have been build on the illusion that speed and scale are more important than a solid business strategy, had to undergo a sincere redefinition process. Many B2C sites have been financed and developed with deficient income- or profitability models and missing competitive advantages and customer benefits. There have been an estimated one to two thousand online retailer in the Latin American market in 2000, but the top 20 players accounted for roughly 73 percent of total online sales one year ago (BCG, 2000). Notwithstanding the market share of the **top-ten retailers** seems to shrink as well. In the more developed B2C market of Brazil, the market share dropped to 57percent, while it is estimated that in Mexico and Argentina the top-ten B2C retailer still hold a market share of about 80percent. For comparison, the number in the United States is meanwhile lying by 38percent and is still constantly dropping (punto-com, 2000). This effect is partly due to the development of new online retail categories, partly due to the regionalization of e-commerce and its growing demand. Also the pan-regional model is playing an important role in B2C of non-digital goods, as purchasing volumes are not very large, and therefore transportation costs do often make up a significant part of the final cost, underlining how "the death of distance" (Cairncross, 1997) is not totally applicable.

We also have to keep in mind that Latin America's **population is very young.** On average more than half of the population younger than 25 years of age (51.58percent[85]) (ECLAC, 2000). Young people adapt a lot easier to the modern information and communication technologies than elderly people, but have a lower purchasing power. Therefore many analysts see the Latin American B2C market booming, once the majority of this "baby boom" will form a potentially lucrative Internet market.

[85] Percentage of population with less than 25 years: Chile: 45.12, Argentina: 45.97, Brazil: 49.27, Venezuela: 53.96, Mexico: 54.12 (CEPAL, 2000).

5. eBanking

Electronic Banking can surely be seen as one of the most successful "killer-applications"[86] of e-commerce. Worldwide, electronic banking transactions have jumped from 30% of total transactions in 1995 to 70% in 2000, the International Monetary Fund (IMF) reported. Of course in a region where the postal system is neither secure, nor dependable enough to carry out monthly bill payments or the like, the potential of the online banking market is vast to begin with.

Additionally to the crucial role banks have traditionally been playing in the region over the recent decades (see Chapter III.2), the high connectivity of the top-income groups is playing a crucial role (see Chapter II.2.2). Considering the extremely unequal income distribution in Latin America, the highly connected upper class is representing high-potential business for banks. Especially Brazilian banks understood this opportunity very quickly. At the end of 1998/ early 1999, the country already counted for over 1.5 million consumers who accessed their banks via their PC (BCG, 1999). This represented more than 40percent of Brazilians Internet users at this time[87]. Brazil became what the BCG and Visa International call "one of the most developed home banking channels in the world" (BCG, 1999). While Brazilian[88] and Chilean banks are clearly leading in terms of the quality of online services and the amount of clients using them (trust), the rest of the region is accounted for lagging behind its counterparts. This has also to do with the proactive support of the governments, in order to get legal obstacles out of the way.

Looking a little bit further afield, e-Banking once a gain is taking the leadership on a new trend forming Internet Economics. It is known as "aggregation". While nowadays the normal user is browsing many different pages during one lock-in (different e-mail accounts, newspaper, banking, chat, music-download, cyberstorage…), aggregation is "the next big thing" (Morgan Stanley), by claiming for: one click – one password – one site. The idea is to gather all the information on a consolidated base and centering it on one single customer (many-to-one). Banks are adapting to this new trend very quickly, even though it is not always very profitable for them. Aggregation is for example introducing price transparency between competitors by definition. But the "unconditional consumer focus of Internet economics" (Hilbert, 2001a) is leaving the industry not many alternatives. How far this trend will invade general e-commerce will depend on the success of new business models, like t-commerce (Chapter IV.9).

The banking sector has, and will be playing a crucial leadership role in the development of e-commerce in the region.

6. C2C

Customer auctions are proving particularly popular in Latin America. Many C2C sites (such as deremate.com or mercadolibre.com) experienced an extraordinary boom last year. It is claimed that this is mainly due to their massive marketing campaigns and the fact that negotiations between customers are accounted for as private deals, and therefore allow to bypass problems such as officially elaborated delivery and payment infrastructure, which have held up development in other areas. The system works like second hand offers in a newspaper, where the C2C platform provider

[86] We use the term "killer-application" to describe an application which successfully entered the mass market, –which is not as common, keeping the heaps of new applications in mind, which emerge daily.

[87] "On-line banking is extremely widespread in Brazil, even more so than in the United States." (U.S. Department of Commerce, 2000).

[88] Banco do Brasil, moved 2.6 million of its 11.8 million private account holders, to e-banking in December. In just 3 months, the bank grew its e-banking user base by a full 36.8 percent. By contrast, private bank, Bradesco, which last year offered a USD 260 million credit line for the purchase of PCs, and aims to finance 150,000 PCs in 2001, had 1.7 million e-banking users at year-end 2000 (http://www.epaynews.com).

acts as the matchmaker (and furthermore as the patron of the deal), but not as the executing party. This is left up to the private participants, which is in the most of the cases restricting business to a local area, due to private delivery of mostly non-digital goods. C2C transactions should have reached around US$192 million by the end of the year 2000 in the region, according to the Boston Consulting Group and Visa International (BCG, 2000).

7. B2G

Just as companies can expect to drive down their costs by transferring their purchasing functions to the Web, so can governments. Lucrative markets open up. This is not only saving costs, but also can be seen as part of an effort to inject greater transparency in public expenditures. It could most probably mean the end of the firm oligopoly market structure, which is often found in many areas of government expenditures. Chile's B2G page is claiming to introduce "efficiency, productivity and speed to the process of public purchases" (www.chilecompra.cl). The government of the State of São Paulo launched an e-procurement portal in August 2000. Initially, the portal is being used for purchases of up to R8,000 ($4,500), but this will be increased to R80,000 ($45,000) in time. By 2004, the Brazilian government expects to bring all of its procurement online. A reverse-auction process is being used. In order to give the portal credibility, Bovespa, the São Paulo stock exchange, was given responsibility to administer it. In Chile all government departments are required to purchase goods and services online through the government's procurement[89]. The site is expected to process at least 1.4 million transactions a year and save US$200 million or more through increased price competition. The Camara de Comercio de Santiago estimates that B2G transaction made up for leading 48percent of all Chilean e-commerce in 2000. Like this governments can significantly support the adoption of the new and cost saving (therefore productivity raising) business models. The proportion of B2G is expected to shrink in relative terms to 25percent in 2004 (as especially B2B is expected to grow), while savings are expected to rise as B2G is entering maturity.

The inefficiency of institutions (be it general institutions like markets or more specific institutions like public ones) is one of the major obstacles to growth in the region. Noting the power of B2G introduction as a best practice of the "new performance", is demonstrating how powerful the use of the new possibilities can help Latin American countries to improve their relative degree of development.

8. M-commerce

Actually the term "mobile-commerce" is a little bit confusing, because it does not fit into the characterization of the commonly known sectors of e-commerce, like B2B, B2C, C2C, B2G and the like. It rather describes a way of accessing electronic commerce. But due to the many special characteristics of m-commerce, it usually is treated separately. The buzz today may be about cell phones and PDAs that connect to the Internet through broadband. But in fact, a much more sweeping change is under way: the emerge of **seamless, continuous economic interaction**. M-commerce is bringing us a little bit closer to the "networked society". People will move seamlessly in this network. This will have severe implications on the way we satisfy our needs[90]. It is about

[89] "El Sistema de Información para Compras y Contrataciones del Sector Público introduce una verdadera revolución tecnológica al interior de los procesos de compra. Este Sistema fue desarrollado con el propósito de simplificar, modificar y dar transparencia a los procesos de compras y contratación de bienes y servicios del Estado chileno." (http://www.compraschile.cl/Publico/acerca.asp)

[90] Some people are worried about this, because it might lead to an attitude, which might evoke an allusion to something like "outsourcing part of your brain". It is an attitude we can already see with many students nowadays. You do not need to know everything anymore, you just need to know where to find it. Having "the world in your pocket", means that you will be able to

individuality, and about the anytime, anywhere aspect. It might start with ordering pizza in the Metro, or "trading stocks while you are jogging", receiving a lunch offer while passing a restaurant or enabling "the bank in your pocket". A broadband and reliable, mobile Internet access, combined with a sophisticated and specialized banking service, leads as far as that the use of cash could be reduced drastically in the future. Coming to a cashier at a supermarket, the touch-screen of your cell phone will receive an infrared message, showing you: "US$ 14.90; charge to your account?". You press "charge" and pass[91].

Figure 38
3G

Source: ITU, 2001; http://www.itu.int/imt; Ericsson, http://www.ericsson.com .

"These new breed of mobile communicator will be the eventual personal accessory combining the features of a telephone, a computer, a television, a newspaper, a library, a personal diary and even a credit card." (ITU, 2000a). This is bringing tremendous changes and challenges with it. Customer intimacy will get highly intensified. The company is with the customer "24-7" and every step he or she is taking. This will only turn the marketing world upside down, but will open new business opportunities in general. This intensification and individualization will also impact the market equilibrium of an economy (see also Hilbert, 2001a). Furthermore there are tremendous effects on consumer habits. It is a kind of "fast-food mentality". People multitask. It is like sitting in the Metro, eating, listening to your husband, ordering the milk for tomorrow's breakfast, receiving a video conference "face-to-face" chat of your friend, while downloading a video. Making purchases on the go is a logical extension.

Parallel to their customers, a company is also able to always get in touch with its employees and due to seamless connectivity, is also able to locate them instantly (think of emergencies). Employees have continuos access to company data and resources, etc., etc..

Present day m-commerce developing is surely hindered by technical problems. Second generation devices have been constructed with the larger focus set on transmitting voice, not data. But overcoming these obstacles is just a matter of time, always related to the regional effort in speeding development. For now m-commerce is restricted to services like downloading different kinds of ringing tones to your cell phone (what turned out to be a killer-app in Japan), or recharging your cell-phone. But also more sophisticated financial transactions are already possible[92]. Playing games is a very popular service amongst Japanese m-commerce clients. Jupiter is expecting that in

answer a lot of questions, which the school system nowadays requires, almost instantly, by consulting the biggest brain of brains through some clicks on your mobile device…

91 Actually the so-called "m-wallet" is already getting designed for current mobile telecommunication techniques. By using SMS or WAP the model has already been introduced into Latin American markets.

92 ENTEL PCS in Chile introduced a service, which allows the cell-phone user to charge her bank account through WAP when purchasing a softdrink can from a softdrink machine.

2005 around half of m-commerce revenues will come from shopping, one third from paid content and the rest from advertising. China is expected to be the worldwide largest m-commerce market in 2006, with more than double the subscriptions to 2.5g or 3g mobile devices than its estimated closest follower Japan (eMarketer, 2001).

In Latin America numerous companies are already working on applications, which suit m-commerce. Once again it is the region's banks which have taken a proactive leadership in this emerging segment. Large banks in the region (like BSCH, BBVA, Bradesco, Unibanco) have been aggressively building partnerships with wireless service providers, reaching out to provide wireless financial content and transaction capabilities to the profitable 10-15percent of high income customers.

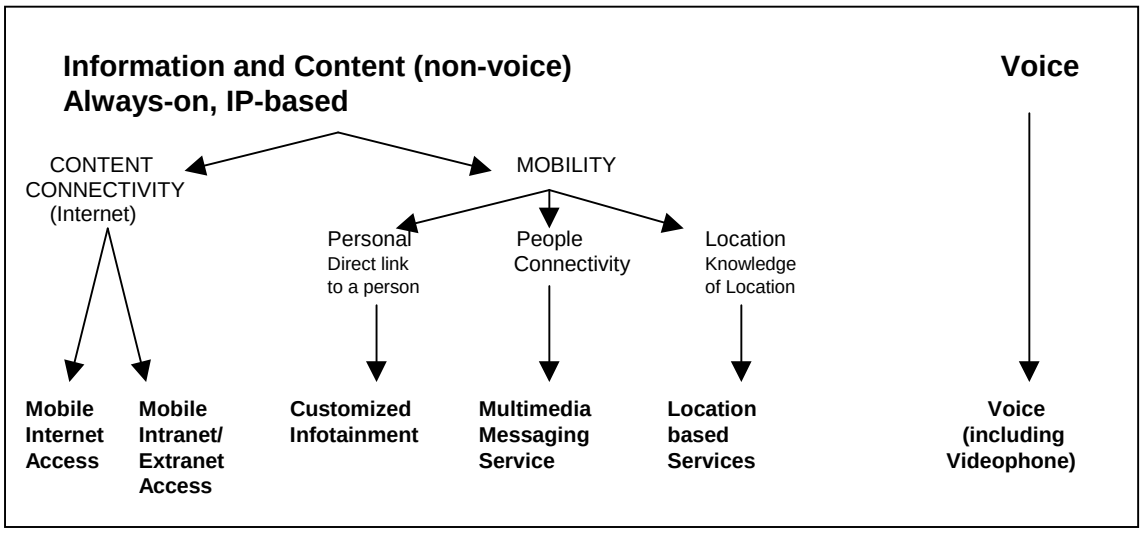
3G will then of course, have to satisfy market expectations. Two different methodological approaches can be emphasized: on the one hand the North American approach, which is rather aiming at adding mobility to Internet content; and on the other hand the European/Asian one, which is rather adding data content to mobility. This difference in the applications developing approach does simply stem from the actual focus setting of these two markets. In general, market expectations are determined by developments in the fixed Internet world that is now delivering high-speed access to content, as well as the development in the mobile world, which is enabling far-covered wireless access to data. Nevertheless, it has to be underlined that "mobile Internet" will not be about a traditional browser outlook (like Explorer or Netscape) and a little screen on a mobile device. It is not "all the same- just smaller". Different business-models will have to be evolved fitting the demand of mobile users. Mobile Internet and m-commerce will rather complement than substitute fixed line Internet. The major difference lies in the point of access. Fixed line Internet permits a "sometimes, somewhere" possibility to network in the net. Mobile access means "anytime, anywhere". Fixed line favors a very media rich, broadcasting experience, while mobile Internet will need to be context relevant, providing specific information and will be highly individual and user centric[93]. Nevertheless, mobile service providers will have to benchmark the quality of their services against the evolved fixed Internet, since expectations of the customer are already high.

Working with the mobile electronic economy, the UMTS Forum identified six major service categories that are expected to represent the majority of the demand for 3G services over the next five years: mobile Internet Access, mobile Inranet/Extranet access, customized Infotainment, multimedia messaging service, location-based service and voice (including videophone) (UMTS Forum, 2001) (see Figure 39).

Providing the "location based service" that enables users or machines to find other people, vehicles, resources, services or machines, for example in a car, gives rise to thousands of different business models which can --and already are-- being developed and exploited.

[93] Even though content provision is one of the major issues when talking about 3G, it does not really give rise for concern, since we know that, once the demand for content rises (and it is expected that in 2004 there will be more people reachable through a mobile device then through a PC), the tremendous business opportunity will lead to the rapid development of suitable content.

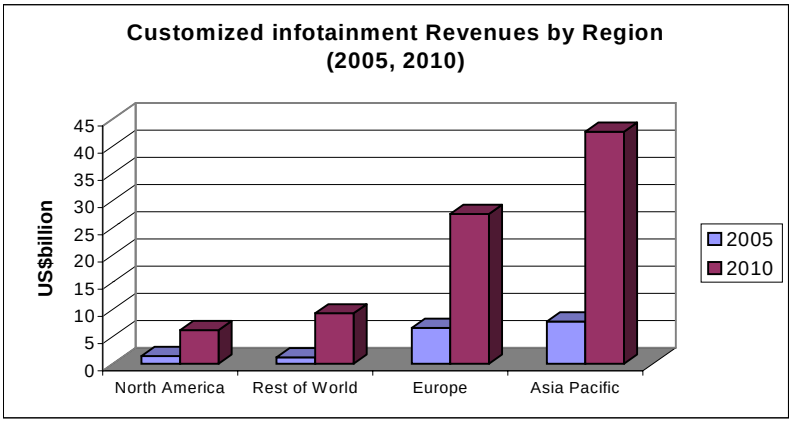
Figure 39
M-COMMERCE BUSINESS MODELS WILL BE DIFFERENT



Source: UMTS-Forum, Report No 9, 2001; http://www.umts-forum.org.

The "customized infotainment" is a service very similar to what is already daily business through the Japanese i-Mode system[94]. It provides device independent access to personalized content anywhere, anytime via structured-access mechanisms based on mobile portals (UMTS Forum, 2001). The UMTS Forum made a "conservative" forecast about the worldwide-customized infotainment revenues for 2005 and 2010:

Figure 40
ASIA PACIFIC REGION IS LEADING MOBILE COMMERCE



Source: UMTS-Forum, Report No 9, 2001; http://www.umts-forum.org.

In general North America is definitely expected to loose its e-leadership to the Asia Pacific region regarding mobile commerce. In the category "Rest of World", Latin American countries are expected to contribute 66percent of the US$1.2billion revenue in 2005, and 46percent of the

[94] In contrast to WAP, which is an open standard, i-Mode is a closed system based on the Japanese 2G ODC technology. It got introduced by the Japanese telecommunication company NTT DoCoMo for the national market. Basing on simple transactions, but rich content, i-Mode has experience an explosive growth in Japan, calling worldwide attention and waking up the imagination about what can be possible within mobile-commerce.

US$9.3billion in 2010. Latin America would therefore reach a m-commerce "customized infotainment revenue" of around US$4.3billion in 2010, compared with US$6.2billion in North America (here: U.S. and Canada), showing us the importance of Latin America's m-commerce potential in future business considerations.

The mobile telecommunication's sector is booming in Latin America like in hardly another region of the world. Right now there are over two and a half more mobile subscriptions than PCs in the region (ITU, IDC, 2001). According to Lehman Brothers, the income generated by the m-commerce concept is expected to jump from US$42 million in 2000 to US$2.6billion in 2005 and Jupiter predicts US$22.2billion for 2005, while McKinsey is expecting around US$15billion in 2002 already. These numbers could still change significantly, depending on how quickly 3G mobile devices get introduced into the regions. Meanwhile it is not clear yet which one will become the adequate business model (or killer-application) for the Latin American market (like i-Mode in Japan for the second generation). Mobile videoconferencing and mobile e-payment mechanism are very likely to be in high demand in the dawning days of mobile Internet, but the fast changing Internet Economics taught us many times already, that it might as well be a service, which has not been considered until now.

9. T-commerce

Another sector of e-commerce, with many special features, is television commerce (t-commerce). This way of negotiating is expected to be very important for the B2C sector of e-commerce. The first step is the digitalization of television. Latin American countries (in specific Brazil and Argentina) are expected to decide during this year on which standard to use. Thereafter TVs will get equipped for digital TV[95]. Digital television is not only leading to better images and sound, but also to the important interactivity. Videos on demand, interactive movies and TV shows, or purchases with a single remote click during a commercial are the expected results. All Internet economics are expected to experience a great boom during this time of implementation. A device as familiar as the TV (South America: 83percent; Central America: 77percent penetration) will enable much more customers to be involved in virtual markets and to extend online trading into the everyday lives of the mass market[96]. On the other hand necessities and demands are different when sitting in the easy chair in the living room, instead of at the desk in the office. Therefore business models will be different, introducing a "new form" of Internet. Like with the emerging m-commerce, it is expected that also in the field of t-commerce tremendous dynamics will occur, especially in the entrepreneurial sense, combining the TV broadcasting world, with the interactive Internet world. Heaps of new applications and content will be created. Of course, due to the fact that the TV-business sector is a lot more structured and in order than the "open Internet", it will not be the same as when the business models for the "traditional Internet" were developed. Nevertheless, in order not to start late again, the region has to be aware and prepare for the advent of this new type of business.

10. E-marketing

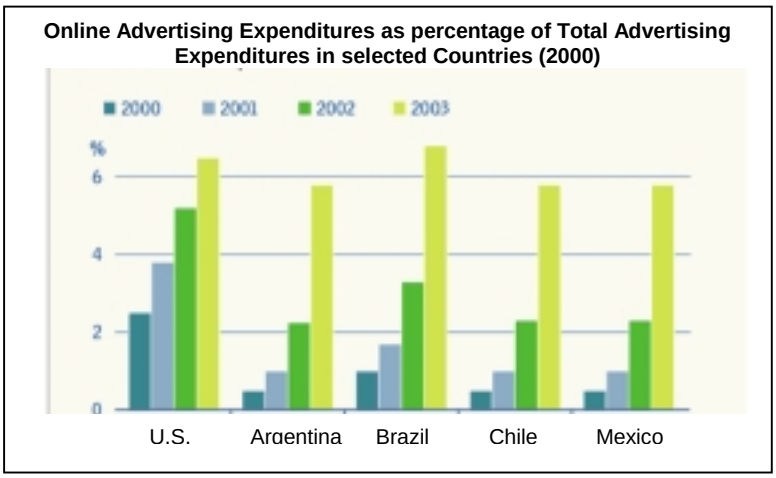
Necessary to take a look at what is known as e-marketing as well. Not so much from theoretical point of view, but rather as a bridge to the following chapter about e-Financing. E-marketing is as important because most Internet companies are basing (at least part of) their income

[95] A big boom in the television industry is expected here (from 2003 onward…).

[96] "Esquemas baseados na integraçao de TV e Internet tém grande potencial no Brasil, pois a difusao de aparelhos de televisao em domicílios, em 1997, no Brasil – incluindo a zona rural – chegava a 86%." (SocInfo, 2000).

strategies on advertising. This business model has been successfully pioneered by StarMedia in Latin America and has since then, found many admirers.

Figure 41
ONLINE ADVERTISING IS GETTING MORE AND MORE IMPORTANT



Source: eMarketer, 2001, MSDW 2000.

Brazil, with a market share of 69percent (MSDW, 2000), is clearly leading online advertising expenditures with US$6.9billion in 2000 (Mexico: US$4.3billion, Argentina: US$2.7billion, Colombia: US$2.6billion (eMarketer, 2001a)). Interesting is the pricing for advertising, as punto-com found out that in Chile and Mexico it is charged over US$40 for a 468times60 banner, whereas Argentina charges less than US$35, Brazil in average US$26 and in the United States it is even less.

These numbers, as well as the performance of international stock markets is clearly underlining that a pure advertising-income strategy is not serving for everybody. Some people expect E-Marketing to loose more and more importance once "brick-and-mortar" companies enter the market and business-models get more focused on selling a service or a product, rather than just creating hype and "catching eyeballs". On the other hand, in the entertainment and information sector, the marketing business model is and will continue to be a decisive and necessary factor. Necessary, because like this, costs of content provision do get shuffled off from the poor to the rich user and at the end both can enjoy information provision for a very low price (just like in television nowadays). Also Affiliate programs (see: Hilbert, 2001a) are expected to become more and more important.

11. Conclusions performance

E-commerce is booming in Latin America and the business world is optimistic. Companies are widely connected, while private consumers either lack connection, or trust and familiarity[97]. A natural push is expected once today's computer-literate students will form a financially powerful spending group. The grocery and the travel industries are expected to grow, while traditional e-

[97] The lack of trust and familiarity also arises from public access. It generaly depends on the frequncy of use. Therefore, the introduction of flat-rate (contrary to dial-up) is highly favoring the creation of trust and familiarity.

commerce markets like books or consumer electronics will contribute less weight. The business side is adapting rapidly to the special characteristics of the Latin American e-commerce market (like low credit card penetration, pan-regional focus). Notwithstanding companies are often lacking a simple but solid strategy to incorporate the new possibilities into their business. Therefore online activity stays low, and potential gets wasted. Due to the infant development professionality is lacking, especially in content and fulfillment systems. Advanced content might be missing, but cannot significantly be pushed directly. Demand is usually creating its content on the openly accessible Internet once the digital framework is set up (means reaching the 'critical mass' is allowing economies of scale, broadband is widely available, flat-rate got introduced, etc.). On the one hand, the sector is going through a consolidation process, while on the other hand, the remaining companies will equilibrate market shares, accounting less importance to the "big players". The actual push for Latin American e-commerce is expected as "brick-and-mortar companies" are entering the market (especially B2B), converting to so-called "click-and-mortar companies". A process that is actually taking place[98]. Banks play a very strong leadership role in the region. Brazil is the dominating market. Some researchers give high growth potential to the Mexican market. In relative terms, also the Chilean market is doing well, but in real terms it is too small. The future shifts away from the computer, creating an omnipresent and never-sleeping networked economy. The "convergence of ICTs " is expected to unleash its dynamics in the years to come, involving fixed or mobile telephone, radio, Internet and TV, and will have a severe impact on the way we understand the terms "information and communication", as well as "e-commerce". Inefficiency of institutions (be it organizations, mechanisms or markets in general) is one of the major obstacles to growth in Latin America. The new performance (e-commerce) is helping to overcome these hindrances fast and efficiently.

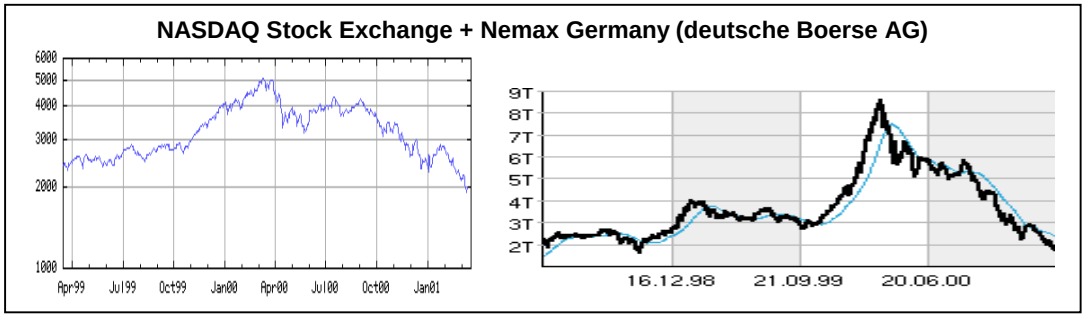
[98] The Cámera de Comercio de Santiago found out that while one year ago the vast part of company-Web-sites have been set up by Internet pure players. In March 2001 the sites set up by "old economy companies" even passed the number of sites from pure players (265 vs. 216) (CCS, 2001).

V. E-Financing

> "Venture Capital has been the fuel propelling much of the New Economy during the past several years." ("From Industrial Economics to Digital Economics: An Introduction to the transition." p.77)

Venture Capital does have a major impact on the innovation system of a country. The creation and maintenance of a solid venture capital market is the only guarantee to keep a countries innovativeness running on the high speed with which the schumpeterian creative destruction is playing its dynamic game. Venture capital is --casi per definition-- essential, every time something new is emerging, in order to give progress a chance. On the other hand, we found out that this time --as so often-- people got carried away with dreaming about what is and will be possible, and expected too much, at a too early stage of development.

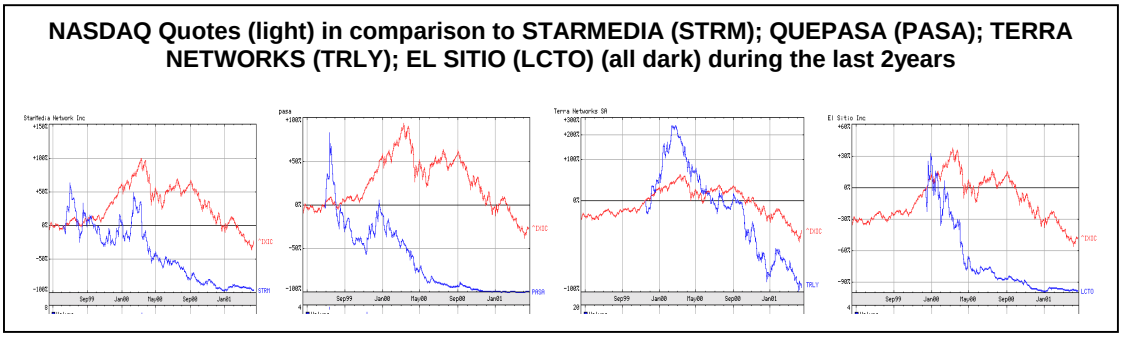
Figure 42
THE NOTORIOUS HIGH-TECH CRASH 2000



Source: http://finance.yahoo.com; www.deutsche-boerse.com, 2001.

Knowing about the state of development of international high-tech stock markets, it is easy to figure out that the so-called "New Economy" entered a severe consolidation process[99]. Latin America seems to have the "double-trouble" with this development, since Venture Capital is per definition high risk, and the region is traditionally seen as a financial risk factor. Even though there have been some successful IPOs of Latin American Internet start-ups during the last two years, this double risk factor is also getting reflected in Venture Capital markets:

Figure 43
LATIN INTERNET PORTALS ON THE NASDAQ



Source: http://finance.yahoo.com, 2001.

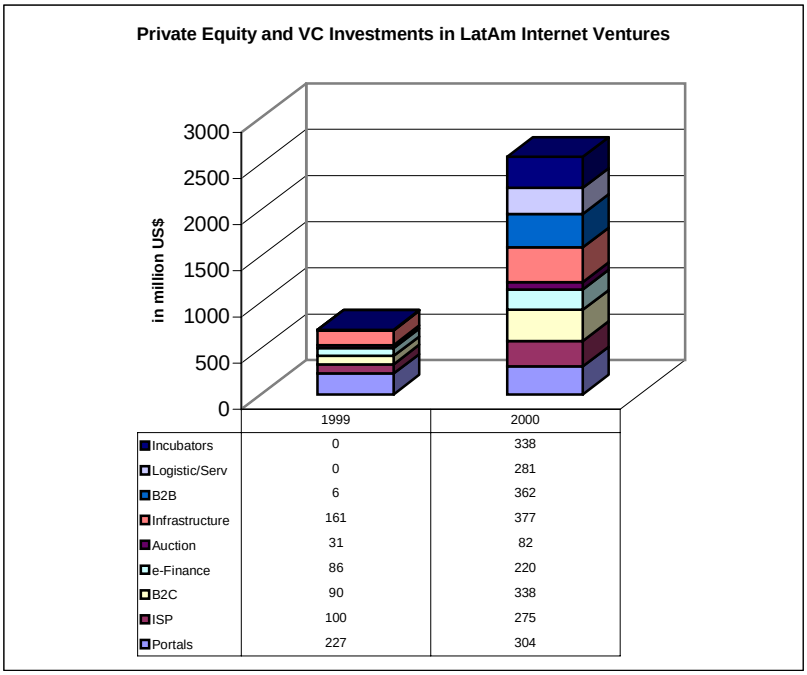
While Nasdaq has been falling around 60percent from its high around one year ago, a Latin American Internet Index (called CSFB from ZonaFinanciera.com) has been down 95percent. Many companies had to delay their planned IPO (like Yupi.com, Latino.com, UOL, AOL Latin America). According to a study of 217 Argentine Websites by Prince & Cooke at the end of 2000, only 12 percent have obtained a second round of financing. In absolute terms however, venture capital did not get cut off for the region, it rather increased from US$701million in 1999 to US2,577million in 2000, according to Bain & Co.. Most of these investment have of course been made in the first quarter of 2000. In 2001 investments have been down to the 1999 level again (IADB, 2001).

It is impressive how several portals, B2B, B2C or C2C companies entered the market in almost no time. While companies like Yahoo, Amazon or eBay took several years to mature, it was

[99] The good news is that the Internet sector saw more than two weddings for every funeral in January 2001 (http://www.webmergers.com/editorial/article.php?id=10).

common practice in Latin America to analyze U.S. models that were successful in terms of valuations, if not returns, and copy them. After language and culture had more or less successfully been translated, this has been highly effective --in a leapfrogging sense. Having a look at portals, the pure model based on burning rates of several million a month, creating hype, generating traffic and trying to find some kind of revenue from that, is a tough sell. The Latin American portals StarMedia, ElSitio and Quepasa lost together more than US$73million in 1999 (CCS, 2000). In the first nine month of 2000, Universo Online Inc. (UOL), Terra and America Online Latin America lost US$142million, US$246million and US$168million, respectively. "We expect to continue to incur significant losses on a quarterly and annual basis for the foreseeable future." (Quepasa, 2000). Too many of the new start-ups in Latin America pursued a strategy based heavily on advertising revenues. This business model was successfully pioneered by StarMedia, which marked a "breaking point" in the Latin American investment history with its initial public offering in May 1999. By raising approximately US$110.4 million in May and approximately US$192.1 million in October 1999 (with their follow-on public offering), the "leading Internet media company targeting Spanish- and Portuguese-speaking audiences worldwide" (Starmedia, 2000) stimulated many other young Latin entrepreneurs to follow suit. During 2000, especially investments in incubators, logistics and service provision and B2B ventures have been the driving force.

Figure 44
INTERNET GOLDRUSH OF 2000 STRENGTHENED LATIN AMERICA'S VENTURE CAPITAL INDUSTRY



	1999	2000
Incubators	0	338
Logistic/Serv	0	281
B2B	6	362
Infrastructure	161	377
Auction	31	82
e-Finance	86	220
B2C	90	338
ISP	100	275
Portals	227	304

Source: Bain&Company; quoted from IADP, 2001.

We can see how the investment portfolio --and with it the investment strategies and the required "culture"-- is extending and stabilizing in Latin America, requiring special attention. At the first quarter of 2001, these investments have been down to the 1999 level again. Frustration because of too high expectations, insufficient financial returns, general lack of professionality or of a thought-through business model and especially temporal market saturation might all be reasons for the high failure rate of Internet start-ups, during 2000. A good idea does not do it anymore. A

serious revenue model and a credible management team are required nowadays. But here Latin America is also disadvantaged. Beyond the obvious legal/regulatory and financial constraints, early-stage firms in the region, lack a network of experienced mentors/advisers like in the business-angel-cultures of developed countries (see Hilbert, 2001a). But the "creation" of such a "business-angel-culture" in Latin America, also has its obstacles. Not only in a volatile Macro, but also as often Latin American companies are not used to behave in a way to favor its development. For example, often, typical family-owned companies are not managed with the transparency investors are used to see in other parts of the world. Many SMEs operate without the corporate governance controls demanded by a Venture Capitalist. Nevertheless there have been undeniable signs for an arising "business-plan-culture" in the region over recent years. Especially in Argentina. According to the EIU, Argentina is home to nearly half of all Latin American-based Internet ventures, creating an impressive entrepreneurial spirit in a country, which is experiencing a continuing recession for about two years now.

Even though this "revolution" is not really getting reflected in the daily up and down of worldwide stock markets, and even though successful e-ntrepreneur claim not to worry too much about the recent development (rather the opposite- helping them to get rid of a lot of hype-companies in the markets), it is an obstacle for the speed of development in the region at this point. Nonetheless, long-term prospects, particularly for well-capitalized companies, such as those that have already raised money or have one foot in the old economy (clicks-and-mortar) are positive.

Latin America is the most rapidly growing Internet community in the world, and after all --as it was not hit as badly by the "New Economy crash" of 2000-- does have the unique chance to approach the dynamic as the long term transition it is, and not waste potential in hype-made investment bubbles. In Latin America struggle, which maybe most visibly got reflected in Amazon.com vs. Barnes&Noble in the first days of the Internet Economy. The big economic impact in the region is expected as existing companies incorporate the new possibilities into their business model, advancing and extending their business, making it more a transition "from bricks to clicks", by involving all different aspects of the ICT-pluralism, rather than fighting a "old vs. new economy war", like it happened in some developed countries.

Knowing about the continuation of the "high-speed evolution" and the shifting focus to convergence, it becomes obvious that --just like it happened with the impressive dynamics of recent years (reflected in the introduction of fixed line Internet access via PC; boom in mobile telephone, etc.)--, venture capital will also be the driving force behind the development of mobile Internet or digital television applications. More solid development strategies need to be envisioned and implemented this time, by the public and private sector, in order to facilitate and attract another wave of investment and to make best and substantial benefit from it (CEPAL, 2001).

VI. Dot-gov

> "How government deliver on its obligations must continually evolve. A recent revolutionary change is the need for government to support and promote an electronic means of communicating and interacting with citizens and companies." ("From Industrial Economics to Digital Economics: An Introduction to the transition." p.91)

The issue in Latin America and the Caribbean is **how** the region can realize its potential for efficient, equitable and sustainable development through the deployment of digital economics. This high-speed evolution is not a technological one, but rather one about economic-, social-, political- and cultural changes. Technology alone and its spread will not enable countries to realize their potential, but how societies decide to integrate these capabilities into their economic and social strategies. Adequate forms of dialogue and cooperation among public, private and civil society organizations are necessary to create conditions that facilitate the widespread implementation of what is known as the knowledge society and a knowledge-based economy[100]. The word "adequate" is of outermost importance. Every player needs to understand its role in the game. The anarchical nature of the network of networks does not allow for a central governor. Nevertheless, the people express their common will through the government in a democratic society, and therefore the way the governments is integrating these new capabilities into their strategies is of outermost importance.

[100] "El proceso de transición hacia una Sociedad de la Información y la Nueva Economía exigirá nuevas formas de actuación del sector público y otras maneras de coordinarse y cooperar con el sector privado." (Grupo de Río, 2001, "Nueva Economía, Brecha Digital y Empleo: Propuestas para la Integración de América Latina a la Sociedad de la Información", XX Reunión de Ministros de Relaciones Exteriores).

This time of "great structural change" (like some governments of the developed world like to call it) started again the discussion about governmental **intervention**. Two aspects should be kept in mind here. One is government intervention into the production process, and the other one is proactive government actions in order to help opening markets and getting obstacles out of the way. While the first one is not really a big issue anymore in the markets of the region, focusing on the second kind of intervention, the definition of "getting obstacles out of the way" can be interpreted very freely and subjectively. One interpretation might be to get the legal framework right: intellectual property, taxation, encryption, digital signatures contracts, standards, network security and computer crime, liability, consumer protection and privacy protection. This would enhance the performance of each link in what the 'Global Business Dialogue on Electronic Commerce' calls the "e-commerce value chain," i.e. the nexus of telecommunications and computer-related services, distribution services, advertising services and financial services required to create businesses and conclude transactions. But here the discussion starts already: how profitable is the protection of intellectual property (in the sense developed countries demand it) actually for the countries of Latin America?

As a first step, essential to remember that most of the approaches about "industry self-regulation with government oversight" (Hilbert, 2001a), are coming from literature and policy suggestions of highly developed countries. Obviously the private sector in Latin America is not as strong, organized and complete as in these countries[101]. Here lies the real key to the discussion in Latin America.

Questions like: Is the private sector strong enough to create flourishing Venture Capital markets, or should the State be more proactive in order to open it[102]? If the "Net" per se is as important and will actually evolve as the generic information infrastructure of society, is it not actually a public good than? What can the State do in order to support universal access[103]? What role does the government have to play with regard to opening markets? Is the European approach preferable (seeing the definition of a standard as a tool to open markets quickly and to push progress, e.g. 3G) or rather the North American (to let the market decide on the standard, without authority intervention)? Would it be justifiable and favorable for development, if government would, for example, intervene in the television industry at this point and set the focus on digitized television sets (e.g. arguing with consumer protection…)? How far can governments guide technological "leapfrogging"? Is it necessary in order to accomplish technological leapfrogging that a government is setting priorities in the selection of technology introduction, or will the private sector select the best-equipped technological innovation? Or might the private sector choose technologies, which might be profitable for itself, but not necessarily aim at pushing progress, and therefore (through the power of transnational companies) private self-regulation the developing countries will lead to following every one of the steps taken by the developed world, always keeping the same distance, never catching up? Do governments have a duty to help (especially

[101] "Es equivocado suponer que el acceso y la gestión de lo tecnológico es exclusivamente un tema privado del que solo la firma debe hacerse cargo. El sector productor de bienes y servicios debe necesariamente profundizar su compromiso con el desarrollo de nuevas tecnologías, financiando y realizando de manera directa actividades a tal efecto. El Estado, por su parte, debe asegurar, en primer lugar, niveles adecuados de investigación basica –actividad que por general no es abordada por el sector privado, dadas las enormes externalidades e inapropiabilidades involucradas—pero además debe actuar como promotor, orientador y articulador de las actividades innovativas y de los vínculos entre el aparato universitario de ciencia y tecnología y el sector productivo…" (Katz J., 2000b).

[102] "The State could also operate as a second-tier bank … so that the commercial banks would be responsible for fund management and risk assessment… and play a more important role in financing innovative technology projects." (ECLAC, 2000, "Latin America and the Caribbean in the transition to a knowledge-based society: An agenda for public policy").

[103] On one hand there are solutions like "public access", of course, but there are also technological solutions, like making it a condition for mobile operators to role out a 100percent national coverage of their mobile net, if they want to obtain a license for radio-spectrum-frequency. Or the pushing of new technologies like digital TV, etc., etc…. .

small and medium sized companies) in re-educating the labor force[104]? Knowing about the tremendous fix costs, the almost non existing distribution costs and the uncontrollable spillover effects of knowledge-based products: what can and should governments do to open and protect these markets the way it is most profitable for the region?

1. Extra-Efforts

In general Latin American governments have grown increasingly enthusiastic about the Internet and e-commerce. This growing appreciation manifests itself in some ambitious official declarations, which let to the implementation of notable "extra-efforts" to facilitate this "industrial driven high-speed-evolution".

Currently, no regional government gives special **tax treatment.** In contrast to the United States, Latin American governments have thus far chosen to apply the same value-added and sales taxes that apply to offline retailing[105]. Governments have, however, begun to debate the question to tax goods ordered online, which breaks down into three issues: taxation of transactions involving digital goods; taxation of non-digital goods bought from foreign countries; and taxation of internal online transactions. No Latin American government has yet tried to tax digital goods, which is not implying that some would not like to try. In Brazil, for example, it has been suggested that an existing flat-rate tax on financial transactions (called CPMF) could be extended to the Internet (EIU, 2001). Of course a tax for digital goods would run the high risk in discouraging the very elastic emerging Internet markets. On the other hand, there is little to be gained by interfering at present. A recent report of UNCTAD, showed that total tariff revenue from digital goods in Latin America was worth only US$181million and represented only 1.1percent of all import duties in 2000. Concerning Import laws, duties and taxes, the United Parcel Service (UPS) claims that they are "probably more heterogeneous in Latin America than anywhere else in the world, and they change frequently" (EIU, 2001). In most cases they make it very expensive to order goods from other countries, but this also seems to serve its purpose[106], as the Brazilian example is showing (see Chapter III.1.2). Nevertheless the call for faster clearance and lower tariffs is loud, as the cyberspace makes its border-less nature clear[107].

Many governments in the region started projects to raise **public access points** penetration in their country. The success of these initiatives remains to be seen, as know about successful examples of public access points, as well as examples which failed (like in Mexico, where only five out of 23 multipurpose community telecenters have been working two years after starting to operate; mainly due to the lack of general understanding (World Bank, 2000)). Generally speaking, private initiatives are more successful here. A worldwide best practice comes from **Peru**. Starting in 1991 with US$3,000, one computer386 and three modems, the private company Red Cientifica Peruana (RCP) is nine years later sustaining 800 "public cabins", which are serving more than half million Peruvians, and is worth US$25million (RCP, 2001). Peruvians using these multifunctional telecommunication centers pay from US$0.75 to US$1.70 an hour[108]. RCP also maintains free educational centers that teach Peruvians how to use computers and navigate the Internet, which is

[104] The principle of life-long-learning would justify that the national education budget has to be readjusted, and that older people also deserve public education. Computer-laps in high schools or universities could be opened at night or during the weekend, to provide further education for everybody, who is interested.

[105] US's HR 1054. It provides tax-exemption for e-commerce until 2004 to US companies. Like this the American government wants to subsidize the 'infant industry' of e-commerce. On an international scale, which is paramount for 'born-global' Internet companies, this is assuring that U.S. online operating firms have a decisive competitive advantage.

[106] At least a short term purpose.

[107] Pressure from courier companies and importers pushed the government to extend the ceiling under which goods could be imported under an express clearance system from US$500 toUS$3,000 (EIU, 2001).

[108] In Argentina, with over 700 public booths, the cost rises to US$5 per hour (latinnews, 2000).

essential. According to various estimates, RCP holds upwards of 50% of Peru's internet market (emarketer, 2001), making Peru one of the world's leaders in making efficient use per Internet host (netsizer.com accounts for around 80 users per hosts in Peru[109]).[110]

In **Argentina**, the government, under the program argentina@internet.todos, guaranteed each citizen to have free access to a secure e-mail account and is in the process of finalizing the installation of some 1,000 telecenters which will provide access to the Internet for low-income and remote communities. In 1999, the Argentine government established low-price telephone numbers designed specially for Internet accesses. This step was aiming at enlarging the time users spend online and it is some success ascribed to it. Furthermore, the government hopes to boost domestic Internet use by providing US$1bn worth of low-interest loans for the purchase of personal computers (EIU, 2001). Since 1999 Argentina also has its Cámara Argentina de Comercio Electrónico (www.cace.org.ar) working in the field.

In **Brazil** the government announced a program in February 2001 to make cheap computers available to the population. Based on the open source Linux operating system, the PCs will be sold and financed (including a modem, monitor, speakers, a mouse…) between US$200 and US$250, or can be purchased for US$10 a month using a loan from the government savings bank. The prototype will allow users internet access right out of the box, but it is also designed to be modular, so that users can add components like printers, disk drives and CD-ROMs (Nua, 2001a). The ministry of Science and Technology created the Programa Sociedade da Informaçao, which became an important representative for Latin America, on the global scene of the ICT discussion (www.socinfo.org.br). Brazil does also have a cyber crime law[111].

The **Chile**an government put up a seven-point plan to facilitate the transition to the knowledge society. It focuses on connectivity, e-government, human resources, technological formation (innovational system), SME and Microfirms, adequate legal framework and international standards (Diaz A., 2001). The Telecommunication Development Fund is being used to assist the development of community telecentres, part of a project to provide Internet access to all of Chile's communes by the year 2006. The ministry of education set a worldwide best practice with the creation of its project "Enlaces: El portal educativo de Chile" (see Chapter VII). The country is having a computer crime law[112] and the government also introduced a law which is guaranteeing that when traffic is stemming from Internet, the telephone company is only allowed to charge for a small percentage of the normal user call. The telephone company also has to share its Internet generated income with the providing ISP, which is giving them a better chance to finance its offer, keeping services low in price or even gratis, leading to the region's lowest access costs.

Colombia can be seen as a Latin American pioneer in establishing a regulatory framework for e-commerce. On the 18th of August 1999 the Colombian congress passed the Law 527, consisting of four parts (basing on the model law of UNCITRAL): general provisions and juridical principles concerning data messages and data communication; e-commerce; digital signature and certifications; validity of the law (Cardenas, 2001). It states that the use of digital signatures will have the same force and effect as the use of handwritten signature, if it includes specific attributes. Furthermore, Colombia's Telecom has a Social Internet program to take the Internet to all Colombian municipalities. In the poorest municipalities, it provides free Internet access. It is also working with the Ministry of Education to wire 2,000 schools.

[109] U.S.: around 2.3; Sweden: 4.5; Mexico: 4-5; Argentina: 4-5; Venezuela: 8; Chile: 10; Brazil: 16;

[110] In 1998 the government of El Salvador made a contract with RCP to build a system of 100 public cabins (after the RCP model) in El Salvador for US$10 million (RCP, 2001).

[111] http://www.mcconnellinternational.com/services/country/brazil.pdf .

[112] http://www.mcconnellinternational.com/services/country/Chile.pdf .

Online buyers in **Mexico** had to confirm their credit-card orders by fax or mail, hindering development tremendously, until new legislation got introduced in 2000. Also the National Securities and Banking commission passed regulations in 2000 that specifically outlined the sale and purchase of equity shares through the Internet (EIU, 2001).

Venezuela's new telecommunications law (drawn up by state telecomm's regulator Conatel in consultation with the private sector), states that "all citizens of Venezuela must have access to the international information network provided by the Internet." Under the joint leadership of public officials and private entrepreneurs, Venezuela has seen the creation of a entity known as Cámera Venezolana de Comercio Electronico, or CAVECOM-e[113] (www.cavecom-e.org.ve).

In **Uruguay** (which is accounted for being Latin America's highest connected country already), the state-owned telecommunication company ANTEL, launched a plan called "Plan Mercurio" early in August. It aims at "massifying" access by bringing Internet devices to every telephone-owning household. The project is installing 25 Digital Community Centers in all state capitals and large cities. They provide access to the Internet and videoconference facilities.

The former President of **Costa Rica**, José Maria Figueres (who is also the UN Secretary-General's Special Representative on Information and Communication Technologies), directs a initiative by the Fundacion Costa Rica para el Desarrollo Sostenible, along with the Massachusetts Institute of Technology and the Instituto Technologico de Costa Rica, which consists in the installation of modern community centers with information and technologies platforms and an educational and sustainable development approach for the use of the technology. The so-called Little Intelligent Communities (LINCOS) are digital community centers that aim at allowing village inhabitants to make constructive use of technological tools. Connected to the rest of the world by satellite, they provide services such as post office, a small medical center, a big screen for videos, speakers for music, an information booth (for schools and business needs), tools for analyzing chemical and bacterial content of local soil air and water, etc. (http://www.lincos.net). The government of Costa Rica has just announced an elaborate plan, called "Digital Agenda". Next to a Website for the Costa Rican Export Promotion Office (PROCOMER) and the Tourism Institute, or the "Small and Medium-Sized Businesses On Line" program, there are initiatives like "Punto.com", which turns post offices into free Internet cafés (ticotimes, 2001). Each citizen is also granted an e-mail account by the government.

Concerning the juridical framework and e-commerce legislation, Latin American governments could speed up and should focus more on setting regional standards, but are not seriously being behind worldwide average (for a summary of activities see: ECLAC, Kuwayama, 2001).

Recently a discussion started in the region with regard to the attraction of **foreign investments**. While some claim that a solid macro-economic framework is the decisive part, no one can really deny appreciation of Costa Rica's deal with Intel, or the creativity of the Chilean government under R. Lagos to travel to Silicon Valley and to meet with the leaders of this "industrial driven revolution". Shortly after the visit, a queue of Latin American governments suddenly stood in line, waiting for their visit in the high-tech stronghold.

[113] Cavecom-e: "¿Por qué una Cámara propia? Ambiente de negocios especial. Activos intangibles, flujo de caja positivo sólo a largo plazo, ambiente competitivo sin fronteras, nuevos mercados, empresas intensivas en conocimiento, investigación y desarrollo, capital de riesgo, información y entretenimiento. Los mercados digitales y las cadenas de valor que los atienden están en etapa de formación. Se requiere intensa y extensa educación de consumidores y proveedores. Los entornos legales, operativos y normativos están también en desarrollo. Las autoridades nacionales y organismos internacionales requieren interlocutor especializado."

2. E-government

We can define institution like "government" as the "central manager of information". Per definition its task is to collect and contribute information, and facilitate (while often bundling = "public opinion") the communication of its people. This is often very costly and therefore the benefits of incorporating information and communication supporting technologies into government activities, is very widely welcomed in democratic countries. Of course this does not only count for the national level. Important to emphasize the call for action in the UN Secretary-General's Millennium Report ("Making Digital Connections": "The Information Revolution has the potential to radically improve the efficiency of our field operations… There is enormous scope for the entire United Nations System to become better integrated on-line." (Annan, 2000)). The e-government concept[114] is basing on incorporating modern ICTs successfully into all government activities. A better performance in **public services** (365times24, individualization, more information and easier to reach, etc.), **higher efficiency** (cost savings B2G, faster bureaucracy, eliminating middlemen costs, etc.), **higher transparency**, and also **standard-setting** forces (due to the unique "monopoly position" a government is enjoying on a national level) are all benefits which are perceived and pursued by many Latin American governments already (www.gobiernoelectrónico.ar, www.brasil.gov.br, www.gobiernodechile.cl, www.gobiernoenlinea.gov.co, www.venezuela.gov.ve, etc.). On the other hand, the fully implemented e-government will only exist if **all citizens** are connected to it. Then the possible interactivity will have significant impacts on democracy and constitutional settings of a republic.

2.1 Public Services

Making it easier for citizens to find information about government activities or services is a relatively simple, but highly efficient application. Obtaining forms for such things as driving licenses or grants, advice on personal issues, such as getting married or applying for scholarships, registrations or complaints, applications for a business permit or storage of information about new laws or regulations are saving a lot of time and energy on both sides. Nevertheless there is a big difference in the utility of Latin American sites in this sense. While some governments in the region maintain usefully coordinated and user-friendly central government portals, others sites rather remind the user of a poorly maintained countryspecific-tourist-information site.

2.2 Efficiency

Governments, as the biggest buyers and sellers of goods and services in their economies, have unrivalled power to stimulate expansion of the Internet by using the medium in their own activities. B2G is one field where the positive impact of the new possibilities is obvious (see Chapter: IV.7). Another "State-owned" killer-application is online tax paying. Accepting tax returns in digital form eliminates much clerical work, reduces errors and speeds the process. The most striking initiatives in this area come from Chile and Brazil. In Chile the government tax agency has allowed income-tax returns to be filed on the web since 1998. In 1999 some 22percent made their tax declaration over the Internet in Chile (CCS, 2000). Brazil has allowed electronic filing (online or on diskette) of federal income-tax returns for four years. The tax agency has made it more difficult to file returns on paper and has offered the incentive of faster processing for electronically submitted forms. As a result, in 2000 it received around 10million returns (90%

[114] "El concepto de "Gobierno Electrónico" incluye todas aquellas actividades basadas en las modernas tecnologías informáticas, en particular Internet, que el Estado desarrolla para aumentar la eficiencia de la gestión pública, mejorar los servicios ofrecidos a los ciudadanos y proveer a las acciones del gobierno de un marco mucho más transparente que el actual." (http://www.info.gov.ar/sitio/gobierno_electronico/gobierno_electronico.htm)

declarations) via the Internet (ebusinessforum, 2001). This rate is a lot higher than in the United States, where OnlineForrester Research predicts that by 2007, 80percent of tax filling will be executed online[115] (Forrester, 2000). Chile counts more than 50percent of their tax returns online and is planning to be the first in the world to provide an individually prepared tax declaration, ready in the web, only waiting for its personal approval. This will be actually the implementation of what could be called "Citizen-Relationship-Management" (in allusion to Customer-Relationship-Management (CRM) in the business world). Other countries in the region are interested from learning from these experiences and should do so, as for example in Taiwan, a poorly designed system to file taxes online ended up costing a lot more than expected (MIT, 2000). But there are many ends to start raising efficiency in governmental institutions. Another advanced area would be electronic treatment of customs documentation, also aiming at reducing costs and time in paperwork[116], etc. .

2.3 Transparency

Some governments in the region understood very quickly how the digits can help them to finally realize what has been promised for so long and so often: transparency and efficiency. Chile is using the catchword "open-government", which is one of the key factors of their ICT strategy (http://www.compraschile.cl). Argentina set up an "anti-corruption net", in order to "make crystal clear how government spends the taxpayers' money" (http://www.cristal.gov.ar) (Terragno, 2000). The new law mandates the countries 23 provinces to publish all official transactions on the Internet. Of course publishing information on the Internet is not equivalent to transparency, but surely a step into the right direction. Actually, thinking theoretically about transparency in the public sector, one will have to claim that the "public sector" should be required to make everything public (at the end, it's the public sector). Apart from theory[117], one will at least have to claim that the public sector is making all of its "non-top-secret" inputs and tools, as well as outputs and products, public. On the one hand this is supporting understanding the public sectors decisions, and on the other hand, the private person could as well make use of the tools, the public sector has developed with the private sector's money.

2.4 Setting Standards

An additional benefit of e-government is the possibility to raise quality standards, for example for information technology suppliers and users. Focus could officially be set on open source software, for example, like already in progress by some authorities in the region.[118] Moreover, by setting an example, e-government initiatives can help to accelerate learning curves in general, or be a powerful catalyst for dissemination of relevant ICT applications, in specific. Thinking internationally, a historically unique process is evolving. Governments are working together in developing e-government applications. Means they are learning from each other's experiences and are looking for the best way to put "their business-administration on-line". Like this, we can observe an international convergence and adjustment in the way, how different democratic governments are treating and behaving towards their people. The thought is starting small, with the fact that one government is adapting the "online tax payment software" of another country, and is ending up with a harmonization of worldwide patterns of democratic governing.

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[115] OnlineForrester Research reports that 2 million people in the US filed their 1999 taxes online, and estimated some 6 million for the 2000 tax returns.

[116] Kuwayama (2001) reports from an outstanding case in Singapore, where the required time for standardized documentation is now measured in minutes rather than days.

[117] …which would surely be rejected by world-wide "secret-services"…

[118] Mexico City announced in March 2001 its switch to free software. The Argentinian government recently revealed plans of a bill that would require its agencies to use open source software (IADB, 2001).

2.5 Government for all

Despite of all the benefits e-government is bringing with it, it can also turn out to become a dangerous "divider". While the highly connected Latin American upper class is able to enjoy the advantages of a digital government, the vast majority of the population is still unconnected. A dual-structure of government services is evolving, which will have to reach those online and those not connected. The rich will obtain a better insight and more information, which means power. The information-poor are discriminated against the best public performance and remain blind. This is creating a "society of exclusion", where it may seem that some citizens already live and enjoy the advanced governing of the digital age, whereas others still remain constricted to the "not yet individualized mass society" of the industrial age, and some even still seem to be trapped in the agricultural age.

3. Conclusions dot-gov

In summary, the role of the government in the transition to the Digital Age is based on two main principles: One is to assure the **smooth and rapid transition**, in order not to fall behind, but rather to be able to gain ground. Enabling a smooth and rapid transition implies first of all to get legal obstacles out of the way (like digital signature). Second of all it implies to work out uprising problems. This would for example include, to stop discussions about 3G spectrum licensing auctions in the region, and to support a fast introduction of the valueable service, through a "beauty contest" approach, based on fast network roll-out time as one criteria. Also problems like cyber-crime require dedication. The lack of trust is one of the greatest obstacles to adoption in Latin America. Authorizing e-certificates, which ensures the credibility of online operating companies, confidentiality of personal and corporate records, but also a secure e-frastructure are tasks of the authorities. Political will is in high demand. If the general conscience about the need and the nature of the transition is missing, diffusion remains slow and the provided tools themselves remain useless (flat slopes of diffusion and learning curves). Even if it cannot be denied that this high-speed evolution is industry driven, governments can take a proactive leadership role in the adoption of the new tools. Governments are often even the driving force[119]. The private sector is not as strong, organized and complete in Latin America as in developed countries. Government's proactivity can help to open markets. A good investment climate and Venture Capital has been the motor driving the Internet economy until now, and actually it is the only way to keep up with its incredible speed and high uncertainty. Visionary creativity is needed. Single and sporadic actions by governmental organizations or members turn out to have a great impact due to their best practice character. The introduction of e-government is not only highly effective, but is also accelerating learning curves[120]. The unique "monopoly position" of the government, provides many possibilities to introduce specific killer-applications. Filling out a tax declaration or being lured by fiscal expenditures on a B2G-site, might be the first online action of a private person or a SME, respectively. Keeping up with the speed of the worldwide creative destruction in the ICT sector, it might be worthwhile in Latin America to consider participating in the Information Technology Agreement (ITA), which counts for 30 WTO members since 1997. These members (which together represent 92percent of global annual ICT trade; including Canada, United States, Costa Rica and Panama) are now committed to gradually eliminating all import duties on telecommunications equipment, including PCs and their component parts (Kuwayama, 2001).

[119] Just think of the ICT booming China…

[120] Notwithstanding, there is a lot left to do in Latin America: The Chilean government is usually accounted for taking a strong leadership role, with regard to the national adoption to the new tools. Nevertheless, as the State makes up for 22percent of the national GDP, it only accounts for 6percent of ICT expenses (ACTI, 2000).

The other main task of the government is to assure **universal inclusion**. Universal access to the network of networks[121] is one part of it. Many governments are trying to tone down the problem by setting up public access points, connecting schools and libraries and the like. While these efforts are honorable, outcome varies in efficiency. Assuring universal access means a lot more than setting up computers somewhere in a remote rural area, and connecting them via a narrow band connection to the Internet. Assuring universal access demands creative and visionary actions with regard to providing nationwide infrastructure coverage and individual access to this digital network. Here the convergence of ICT is playing a decisive part. Ensuring national coverage for digital mobile networks, by making it a requirement for mobile operators in spectrum licensing, or the rapid inclusion of further access possibilities (like television or the cellular) would be examples. A minimally restricting and technology neutral approach is indispensable here, in order to keep all doors open and let the schumpeterian creative destruction play its productive game at its fast pace. Powerline could be one alternative to push the goal of universal access as fast as possible. The second part of universal inclusion is to ensure the possibility making the best benefit of the tools, for all citizens. One part is the tool, the other one is the user of the tool. Often traditional thinking patterns and educational systems in use do not fit the reality of the emerging Information Society, loosing great part of its given potential. This leads us to the next chapter.

[121] "O governo, nos níveleis federal, estadual e municipal, tem o papel de assegurar o acesso universal as tecnologias de informaçao e comunicaçao e a sus beneficios, independentemente da localizaçao geográfica e da situaçao social do cidadao, garantindo níveis básicos de serviços. Estimulando a interoperabilidade de tecnologias e de redes." (InfoSoc, 2000).

VII. Education

> "...this high-speed evolution is actually not a technical one, but an educational one. Education is the foundation stone in the Knowledge Society. Education is becoming omnipresent in the organizational structure of any company which is operating in a knowledge-based economy." ("From Industrial Economics to Digital Economics: An Introduction to the transition." p.92).

Given the advent of the Knowledge Society, a profound and wide-ranging discussion started, concerning information and communication supporting technologies and education. The frame of the paper does not permit to go into detail with regard to regulatory and administrative aspects of the discussion, but nevertheless we should try to untangle the issue. Having a look at the "ICT and education" discussion, three basic issues can be distinguished: the first one is the discussion about how modern ICTs can be used to **facilitate general education**; another issue is **education about ICTs** (computer literacy, ICT-experts, etc.); and a third discussion is focusing on the effects the **paradigm-changing** networking society does have on education, leading to the knowledgeable worker, lifelong learning, entrepreneur spirit, etc..

1. ICT for education

"Developing countries urgently need to realign their budgetary priorities and make universal access to quality education a top national objective" (G8, 2000). Basically, education has to do with providing information and exchanging it (communication). Obviously the Internet is the most powerful tool ever invented to do both of them.

The printing press had a huge impact on the way we educate ourselves, and also modern tools that support the storage and spread of information (like the radio, tapes or the television) brought up new possibilities for general education. Nevertheless, the interactivity the Internet is enabling and the absorbing and unifying character of this "network of networks" will and already is changing the way we are studying, learning and thinking to an even bigger extend. In Latin America basic education is often suffering from striking deficiencies, especially in low-income classes or in remote areas. The challenge is therefore by many seen in two dimensions: one to overcome the old obstacles and secondly to adjust to the requirements of the Knowledge Society. Thinking about "leapfrogging" and rejecting the "either-or-approach", this is giving Latin America the great chance to kill two birds with one stone. All over the world, educational system need to be reviewed, while the integration of information and communication technology in the educational system of the region, can also contribute to overcome old problems like high costs, low efficiency, outdated content and short reach. Many already understood the great advantages of modern ICTs, in comparison with traditional learning aides, and are using them individually for their personnel benefit. Also private companies are sprouting which are offering "virtual education" of all kind (professional-, hobby-, children and scholar education (like: klickeducacao.com.br or escolavirtual.com.br in Brazil.)). Also public education discovered the highly effective power of virtual networking and is using it (like: educ.ar[122] (Argentina), CDI[123] (Brazil), Redes Escolares (México), Schoolnet (Canadá), E-rate (EE.UU.), or the World Links for Development (WorLD) Program of the World Bank Group[124]). Chile is accounted for a worldwide "leader in using advanced ICTs to improve educational outcomes" (infodev, 2000a). In Chile, the Enlaces Project (www.enlaces.cl) has successfully connected all secondary schools and more than half of primary schools to the Internet, which gives more than 90percent of the Chilean students access to a connected computer lap. The Ministry of Education started the pilot project in 1992 with 12 schools in Santiago. But also the World Bank contributed to the project (WorLD, 2001) and for example, the telephone lines, as well as access service got donated by Telefónica CTC in 1998. Schools are provided with computers and technical support, as well as extensive technical training in order to make the program equipment self-sustaining. The goals of the program include: ensuring equal access to information regardless of geography; modernizing curricula and administration; development of collaborative projects across different schools; and enhanced teacher training and education.

Also third-level education embraced the new possibilities and came up with a variety of distance learning and study supporting online applications[125]. In Mexico (which is claimed for being the pioneer in Latin American Internet experiments, by connecting the nets of Universidad Autónoma de México (UNAM) and the Instituto Tecnológico de Monterrey) the Instituto Tecnológico de Monterrey is still leading. The "Tec" is maintaining an impressive net between their faculties[126], and also set up a virtual university (www.ruv.itesm.mx). It is already possible to complete almost every kind of career "virtually" on many universities in the region[127], and this is highly welcomed by the --naturally often "poor"-- students. From the almost 7,000 students of a postgraduate program in Monterrey, more than 6,000 receive their classes via satellite, while physically being in different parts of the hemisphere (Latintrade,

[122] "Educ.ar tiene un objetivo primordial: ser una herramienta para democratizar la educación." (www.educ.ar).

[123] In Brazil's urban slums, the Committee to Democratize Information Technology (CDI) in four years has created 110 sustainable and self-managed community-based "Computer Science and Citizenship Schools", using recycled technology, volutneer assistance, and very limited funds. CDI schools train more than 25,000 young students per year in ICT skills that give them better opportunities for jobs and education. CDI also provides social education on human rights, non-violence, environmental issues, health, and sexuality (infodev, 2000a).

[124] See: http://www.worldbank.org/worldlinks/english/html/countries.html

[125] See: http://www.rau.edu.uy/universidad/univ.htm for a huge list of Web entrances to "The universities of Latin America".

[126] See: http://www.rau.edu.uy/universidad/univ_bra_mex.htm for the links. Also: http://www.sistema.itesm.mx .

[127] See e.g. also the Universidad Virtual de Quilmes in Argentina with 2295 students studying "virtually". http://www.cvq.edu.ar . Or the Red Universitaria Nacional (Chile) REUNA: http://www.reuna.cl .

2000). Distance learning is also a great chance for students in remote areas, like the EU-project "Distance Education in Patagonia" is showing us[128] (EU, 2000).

2. Education about ICT

A major obstacle is a lack of understanding of the new tools[129]. This is starting from basic computer literacy of an individual person, over the new dynamics unleashed in a networking business world[130], ending up with so-called ICT-experts. There is a lot of justified concern about ICT specialists, or rather the lack of them. This is not only including informatic specialists, programmers and all kind of computer or telecommunication engineers, but also e-commerce businessmen, digital economists, etc., who are dedicated to monitoring, facilitating and driving the transition. Broadly speaking, experts are needed in every science in order to keep the incessant creative destruction of innovation going. Besides the experts, in the years ahead, technical skills increasingly will be required for competitiveness not only in high-tech industries, but in more traditional ones as well. Broadly speaking, using the technologies, which are supporting to transmit, interchange and store information, will be a basic skill requirement. This does not have to shock us. In the first days of the automobile you had to be a mechanic in order to drive a car. Most of the technical innovations get more and more "user-friendly" as they are maturing. This is a natural process, connected to the consumer's demand. On the one hand this can lead to a "de-skilling" effect[131]. Due to the fact that ICTs posseses the unique ability of being somewhat self-explainable and auto teaching (after all they are about information and communication…), the new tools can raise skills and push talents. Starting from a complete computer illiterate --like most of us have supposedly been just a few years ago-- the majority of applications do have a self-explaining nature. I am not only referring to the "Help-section" of "Microsoft-Word" right now, but most of this is purely due to the fact that this "revolution" is not about technology, but about communication, handling and exchanging information and the subsequent networking and the human instinct creating and guiding them. I do not want to claim that personnel teaching on ICTs got absolutely rendered obsolete. Person-to-person training will always be highly useful for everything. But the more and more "user-friendly" ICT is pushing the (often psychological) barriers of their utilization very low, and the auto-teaching character and the continual evolution of the network, is steeping the slope of the learning curve extremely. Like this new network-business-models have been created by inexperienced teenagers, and ideas which sounded most naive, got successfully implemented[132].

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[128] Project from 07/97 – 11/99: "The project … is aimed at supporting a joint institutional effort of a group of Argentinean and Chilean universities supported by the European members of the network, towards the creation of a common technological and service infrastructure to provide an open and distance learning model … . The programme has high social impact in facilitating education in an isolated region such as Patagonia… ."

[129] In fact, introducing new equipment without first improving human resource and physical systems may actually increase electricity consumption without any additional economic growth (Mansell and When, 1998).

[130] According to a survey of the World Information Technology and services Alliance (www.WITSA.com), the understanding about the progress and new models in the business world is –after the lack of trust and familiarity (26percent) the second most hindering obstacle (WITSA, 2000).

[131] An often used example of the de-skilling effect is the scanner in the supermarket. While this is more a natural phenomena (think of assembly line production), some people go as far as ridicule visions about the networked world to "outsourcing part of your brain". But that is what it is. Once you will always be connected to the network of networks, through an instantly transmitting wireless connection, which you always and everywhere have with you, the attitude about what we need to know, and what we look up, and the way we think in general, will surely change.

[132] At this point a very deep and wide-ranging discussion about the codification of information starts. We know for example that a large part of the "brainworkers" in Silicon Valley are on average only 25 years old. Almost half of the Internet users are on average younger than 25 years. Young people do seem to have the ability to understand to "think network", in comparison to older people who for a long time already have been taught to think more "linearly". To a certain degree we all think "linear". This is how we created our language, and the way we codify our language when we write it down. But it does not necessarily need to be like this. We know about the left and the right part of our brain, and that we are also capable to think in images, pictures, sounds and

3. The e-ducation paradigm

There are many impacts of the emerging networked society on the education paradigm. And there is a lot of talk about how our focus needs to be shifted from --for example-- learning the solutions of problems (like in schools nowadays), to focus more on methods of how to solve problems (students with their computer and Internet access in their final exam). As we integrate modern information and communication technologies into our daily lives more and more, there are surely changes expected in the understanding of basic education (the necessity of life-long learning, etc.). The impacts of these changes in paradigms are tremendous, as we can see that "life-long-learning" would justify the reallocation of the national education budget, in order to serve all society, not only basic children education. Computer-laps in schools or universities (which are unused at night or over the weekend), could be opened in order to train (and up-date) the national work force, for a beginning. The business world will have to change its focus as well (on-the-job-training, constant global networking, etc.). The fact that some --justifiably and understandably-- call for the introduction of an "academic title with expiration date", may illustrate the problematic. The hope for Latin America lies in the fact that, due to the often more flexible educational structures and the often more flexible labor markets, the region will have it easier than, for example Europe or Japan (with their rigid education and labor structure) to adopt to this challenges (Hilbert, 2001b). Also academic institutions per se, are in high demand, and can have a profound impact on progress and development, but are often decades behind in Latin America[133]. A profound understanding of the changes is demanded here, requiring research and a lot of political will.

A central feature of the Internet age is that many of the key innovations and new markets have been generated not by historically dominant players in technology industries, but rather by individual entrepreneurs and small and medium-sized enterprises. Entrepreneurship plays a particularly critical role during periods of rapid economic change, as small, agile firms increase the ability of an economy to quickly respond to new challenges. Argentina is home to nearly half of all Latin American-based Internet ventures[134] (EIU, 2001). Most impressive from this fact is probably the consideration of the overall economic performance of the country during the last two years. Counterintuitive to that one might generally expect that to create a dynamic climate in which entrepreneurship can flourish, a sane macro is essential, looking at Argentina, one might get the impression that a declining macro drove many people to taking their faith in their own hands. Like already mentioned in the e-Financing chapter above, in countries with very scarce resources there is naturally a low tradition of entrepreneurship or tolerance of risk and failure. Moreover, entrepreneurs that do get their start do not have access to the information, networks and support services available to their U.S. counterparts. But while the older generation of a good businessman in the region is usually stereotyped by metaphors like: "gray hair" and "family connections", "rather used to protecting their companies against inflation, or fighting for protective tariffs", "not really worrying about the impact and importance of saving a single digit percentage by the implementation of new technologies, in awareness of traditional economic problems of the region",

moves… . The human being seems to be very flexible with this. But until now our "linear education" taught us, --for example-- that a book has to be written page after page, and does not have the structure of a unlinear network of hyperlinked Webpages… .

133 "En los ejemplos de países exitosos con avances significativos hacia una sociedad de la información, las universidades están jugando un rol protagónico, preparando profesionales con una amplia base conceptual, pero también con una sólida formación en las tecnologías en uso en el ambiente productivo. En Chile estamos muy distintas aún de contar, salvo honrosas y escasas excepciones, con universidades comprometidas en aportar en este esfuerzo nacional." (ACTI, 2000).

134 According to e-businessforum "nearly half (43%) of Argentinian Internet start-ups were launched in the first semester of 2000, when technology shares quoted on the US-based NASDAQ exchange were still relatively buoyant. Online publications represent the largest share of the start-ups, with 16.6% of the total, followed by e-commerce sites (14.7%) and entertainment (13.8%)…Nevertheless as elsewhere in the global Internet industry, dotcom firms in Argentina are heavily cutting costs, often sacking workers, in order to show profits earlier and to stay afloat… Analysts describe Argentina's current virtual environment as ground that has been scorched by fire, but sufficiently fertile underneath to nourish hearty survivors, as well as better- conceived--and financed--start-ups." (www.ebusinessforum.com)

"relaying a network of firms they have inherited by their fathers", and so forth -- nowadays more and more sequentially, how young Latin American entrepreneurs knock on the doors of un-"familiar" Venture Capital companies, holding a piece of paper in their hand, claiming it would be worth a couple of million. Some kind of "Business-plan-culture" and its more strategically thinking is starting to hit Latin America, waking up the entrepreneurial spirit of its business-world[135].

4. Conclusions education

The decisive capital in an increasingly knowledge-based economy is intellectual capital. In pecuniary poor, developing regions, intellectual capital is the most valuable capital available in order to push development (Annan, 2000). The effects of modern ICT have on enhancing intellectual capital are tremendous. All over the world, educational institutions of all kind are more or less ill-equipped to face the emerging requirements. Like always when starting on a common level-field, the one who will understand best to adjust to the chances will profit the most. This accounts for developed the same as for developing countries. The chance for developing countries is tremendous, as the re-adjusted and better-equipped agenda is not necessarily more costly, but highly effective. ICTs are a big help in facilitating general education. It facilitates the spread and exchange of information like never before and enables to reach information fast, at a relatively low cost and almost independent of the physical location. Research is necessary in order to identify the new focus, and cheap re-adjustments need to be taken immediately. A national academic network is indispensable in order to keep the different educational institutions informed and up-dated about their sciences and specializations. IDC expects that in the U.S. in 2005 around 40percent of training and further education programs will be online.

As praxis is showing, setting up a computer and connecting it to the net often does not reach the desired effect. Diffusion curves are one part (technology), learning curves the other one (user). The way we see information codified is changing, evoking a shift in paradigms. All of us will have to "learn how to learn" again. Young people might have it easier, due to their greater open-mindness towards new thinking patterns, but the change in paradigms is all-penetrating and challenges everybody[136]. Providing special training and changing entire curriculums is surely one way of accelerating the process. Further ones are "tacit" activities aiming at leading people to overcome initial fears and unfamiliarity. For example teachers using e-mail and a homepage to accompany their classes; or like the Brazilian government which made it more difficult to fill out tax returns on paper, which drove many Brazilians to use the online application; or more extreme steps like freeing e-commerce from sales tax, in order to "subsidize the infant industry"(like in the U.S.). Making the user stakeholder, by letting him discover his personnel benefit from individually investing in adapting to the new tools, proves highly effective.

The last three years have seen many successful examples of entrepreneurship in the region Valuable investments have been made, jobs got created and markets advanced. Nevertheless, best practices here are mainly sporadic and anecdotal in nature, and an established entrepreneur culture does not exist here yet. There have been some helpful efforts of mainly private organizations to facilitate and push this trend (like Endeavor (www.endeavor.org) or Explorador (www.explorador.com)). However, weakened by the international down-going of high-tech stock markets, entrepreneurs have a tough place in the region and definitely deserve more attention. This is especially true, given the advent of the "Internet mobile" and "digital television" revolution and the high demand for entrepreneurship required in order to handle the flood of the upcoming demands and take best advantage of these dynamics in the region of Latin America.

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135 "André Sapoznik, 28, a Stanford MBA who, in January, quit his job with a big Brazilian bank to help found a startup called E-bit, which allows customers to rate e-commerce sites: "The entrepreneurial craze brought by the Internet is very new to Latin America. In Latin America, the image of a good businessman is gray hair and family connections. There was no culture or funding. If you wanted to start a business in Brazil, it was either a McDonald's (MCD) franchise or a gas station, or you inherited a company." …Six months ago, no one knew what an IPO was … Three months ago, it was a couple of 20-year-olds with a piece of paper, saying it's worth $10million and they want an answer in a week. " (August 2000, "Brazil: Internet fever"; http://www.e-biz.com)

136 Like this we have seen that half of the CIOs (Chief Information Officers) of the largest American companies have been replaced during 1998 (ACTI, 2000).

VIII. Conclusions and look ahead

> "Unfortunately we often tend to overestimate the short term impact of changes and forget to consider the long term effects." ("From Industrial Economics to Digital Economics: An Introduction to the transition." p.124)

The unfolding new global conditions, in which societies are looking to establish their role, show us every day more and more that knowledge and information are becoming the focus of activity, penetrating and dominating financial capital, natural resources and the work force. Richness and poverty and degrees of development in general, will be determined by the capacity to manage and take advantage of technologies, which support the processing of information and the generation of knowledge.

It is obvious that the first ones to enter the Digital Age are reaping the greatest rewards. The generic nature and the **profoundness of the changes** is on one hand accelerating and on the other hand also readjusting the setting of this more and more globalized world. As the central principle of all kind of modern scientific thought, the theory of evolution holds that the survival or extinction of each organism is not determined by the organism's strength or intelligence, but rather by its ability to adapt to its environment (Darwin, 1839; 1859). Information and communication supporting tools or techniques have always been the central part of human conduct[137]. The advent of the great network of networks started

[137] Language itself is nothing more than a technique, which supports information flow and enables a specific way of communication. But there are many ways to communicate. This is a great part of the broadband discussion, as broadband is enabling communication

another chapter in the evolution on how we handle information and the way we communicate. This is giving rise to important modifications in structure, by which the different organisms are enabled to "compete" in a modified manner, "…and the best adapted to survive" (Darwin, 1859; Chapter 5-Laws of Variation). This process is perceivable in different dimensions. Individuals, social groups, companies and countries are involved in this transition to what is generally known as the "Information Society". This "globalization driven by the people" does have outermost importance for the integration of Latin America into the global stage. Basic conditions differ from the rest of the world. The region inherited a different framework from the industrial age, from which it will evolve to the Digital Age, facing different obstacles, calling for different solutions. Naturally times of great structural change may also evoke uncertainty and fears. But proactively standing up to the challenge could convert into a very powerful element to promote intercultural dialogue and the protection and integration of Latin America's culture into the worldwide environment, instead of repeating history once again and getting overrun by progress[138].

Analyzing where and how the region is placed in this global race underlined that in many respects Latin America lacks significantly in incorporating the new possibilities[139]. The Internet high-speed evolution just recently started to take off in the region (around 1999). Nevertheless, it took off explosively. Latin America is, and is expected to continue to be the fastest growing Internet community for now. This late take off is part of the special characteristics marking the region. Latin America did not experience this "**old vs. new economy** war", which took place in many developed countries. Whereas in the developed world some companies got "amazonized" (as the jargon goes- referring to the "bookstore-war" between Amazon.com and Barnes&Noble), we see more of a transition in Latin America. Pure Internet players (punto-coms) and their "New Economy" did not have such a severe impact on the Latin American business world. The real impact on the region is expected once the "brick-and-mortar" economy --which until now stood mainly still and observed-- starts to exploit the new possibilities. This trend has already been notable in the regional banking sector. Existing production processes are being rationalized and improved; entire value chains and final performance is being revised. This is what is increasing productivity, enhancing growth, increasing competitiveness and this is what makes e-commerce to have an impact at local level.

Comparing with other developing regions, the eWareness in Latin America is relatively high. E-commerce is booming and the new opportunities are enthusiastically welcomed- ...by those who can afford it. In no other region in the world, the **Digital Divide** can be seen as drastically as in Latin America. This might be inherited from the industrial stage setting, and calls for dramatic actions not only to avoid explosive further increases in inequality, but also rather to use the Digital Opportunity to equilibrate distribution. Policies must be implemented. Joint efforts that consider the special characteristics of the region are required in order to avoid dependency[140] and the waste of scare resources[141]. Information and communication technologies prove as a highly effective tool for enhancing **development**. They are neutral as regards to the final purpose of their use and

through images, pictures, moves, sounds, etc., which are all different ways to transmit information and to generate certain feelings in the partner of communication- leading to the virtual reality discussion.

138 "Es un hecho comprobado que la Nueva Economía puede producir un efecto de erosión de la cultura nacional, frente al fortalecimiento de culturas transnacionalizadas. Pero, al mismo tiempo, si se aplican las políticas de estímulo apropiadas, también es posible que fortalezca las culturas locales y sectoriales, en la medida que grupos de interés específico puedan asociarse en redes con grupos similares." (Grupo de Río 2001, "Nueva Economía, Brecha Digital y Empleo: Propuestas para la Integración de América Latina a la Sociedad de la Información", XX Reunión de Ministros de Relaciones Exteriores).

139 Especially when comparing with transition economies like in Eastern Europe.

140 Either economically, culturally, politically- talking about every dependency modern ICT can introduce by its high information flow and its widened possibilities.
"La región, entre ortos desafíos, deberá … contrarrestar la fuerte concentración de poder que la rápida informatización coloca en manos de países industrializados y grandes empresas transnacionales, y obtener mayor cooperación internacional." (Katz J., Ventura-Dias V., "La transición hacia una sociedad del conocimiento", Junio 2000).

141 By for example not being aware of the general development and trends, and therefore not making use of efficient leapfrogging.

support un-patronized substantial growth, based on real productivity increases. Often we are fighting fire with fire in the industrial age setting, and the dedication to these urgent problems is leading to a postponement of Latin America's effective integration into the global Information Society. This "**either-or-approach**" is preventing us form realizing that the innovations of technological progress, can help to solve the current problems, even in a more efficient, forward looking and long-term valid manner. Due to network externalities, countries that are in possession of the technologies, are even interested in transferring them (Hilbert, 2001b). In comparison to the past, today there are few, if any, technological barriers to the transfer to developing nations (UN ICT-Task-Force, 2000). Nevertheless, in order to catch up, the developing countries of Latin America will have to search for creative solution with regard to what to chose and what to leapfrog. Going exactly the same way as developed nations did before, becoming an uncontrolled play-ball of the interest of multinational companies[142], without pursuing a solid national investment and development strategy, is not narrowing the gap. A development strategy is of course not limited to the use of a specific technology. Profound and generic changes call for extensive and far-reaching actions, involving all society. All countries, which are further advanced in this transition, do have one thing in common: a **coordinated approach between the public- and the private sector with a special focus on education[143].** This is visualizing that adjustment to the networked world is not an overnight process. We can identify five different fields, which call for joint action:

- @) Access
- @) Regulatory Environment
- @) Financing
- @) Education (human capital)
- @) The Soft Factor (eWareness)

Access

The availability of these technologies and the problem of accessing the heart of the Information Society are crucial points to start from. Nobody ever limited the Internet to a computer. Not even to a monitor. The network of networks is about transmitting data, the exploitation of data (which results as information), the exchange of information (which is communication) and the application of information (which results in knowledge) (Hilbert, 2001a). The next step of the emerging knowledge-based economy will be to develop and implement business models, which fit the omnipresent, seamlessly networked world that we are evolving. Cell phones, televisions, cars, refrigerators, microwaves, etc… will get connected through the network of networks. Computers will stay the main focus in the business world, but as needs are different, while being on the streets or in the living room, so will be economic solutions to satisfy those demands. While looking at these dynamics which are known as "the **convergence of ICTs**", it is notable that the choice to codify information in the form of written language is a very limited one. The introduction of broadband, 3G, digital TV and the like will change the way we think about transmitting information and about communication. Voice or e-mail, voice recognizing- and letter interpreting-software, video-conferences, images and video clips, interactive game-shows, on the road or in the

[142] A worry, which in a recent presentation to the UN Secretary-General ("UN ICT Advisory Group Report on Using Information and Communication Technologies to Combat Poverty") has been emphasized, by stressing that an "endeavour to narrow the digital divide should be spearheaded by an 'honest broker'." (UN Press Release, 2001).

[143] As regards to public-private sector initiatives, Chile is providing a best practice here, due to their recently implemented and highly productive "initiativa publica privada".

easy chair, will all unleash their dynamics in the years to come. There are no limits set for creativity on how information can be transmitted and over which codification communication can be carried out. This needs to be kept in mind in order to be able to make use of economies of scope in the e-frastructure[144] and to be able to prepare the region for these upcoming dynamics. A highly technology-neutral approach is demanded here. The schumpeterian creative destruction is continuing to play its tough game at a very high speed, and everybody who will limit its flexibility or will not keep up with this speed, is left aside. Latin America is facing different characteristics than all the other regions in the world, concerning their given ICT infrastructure:

At the end of 2000 the penetration of main telephone lines has been lower than 20percent and only 5percent owned a computer. Mobile telephones became the most widely spread telecommunication medium in many countries of the region, the penetration of television passed 80percent and the electricity and mobile network coverage is widely completed. Given these characteristics, the later mentioned seem to be better-equipped solutions to enter the network of networks for the time being. Technological innovation has to be considered and creativity is demanded, in order to solve the access problem. The focus needs to shift away from *how can we run behind worldwide development as fast as possible,* to *how can we leapfrog into the vanguard of development, given what is available*. Constantly evolving e-novations represent tremendous opportunities to win some ground and time in this fast race.

Coverage and network roll out is disappearing as a problem of access. In contrary to what many people assume, many countries in the region already are in possession of a widely completed digital network coverage (GSM / CDMA in the 1800-1900 band (PCS) or D-AMPS TDMA / GSM in the 800-900 band; = mobile telephone[145]). The roll out can be pushed and supervised by the authorized telecom-regulator and updating can be favored through competition in the private sector. The more concerning problem becomes the **end-user access**. ICT-equipment is expensive and out-dates fast. It needs to be focused on cheap and effective solutions (like would be set-top boxes for TVs at this stage of development) and equipment price reducing policies need to be pursued[146]. Consumer of ICT equipment need to be informed and aware of technological progress, in order to be able to most effectively make use of the ICT convergence process and not waste scarce resources[147]. The Digital Divide launches as a divide of costs. Therefore the key in providing universal access is located in low cost of end-user equipment.

But this “revolution” is not a technological one. Actually technology is the easiest part of it. A further point would be the need to be set up a flexible, but stable framework, in order to handle the present and upcoming dynamics:

Regulatory Environment

A well-equipped regulatory environment on the national and the international level, is always a key element. First of all legal tactics need to aim on getting obstacles out of the way: digital signature contracts, network security and computer crime, liability, encryption, consumer protection and privacy protection, etc.. Long established systems, concerning intellectual property or taxation, need to be reviewed and adjusted. Best-equipped standards need to be found in order to take advantage of economies of scale and scope and the omnipresent network externalities[148]. The

144 For example one fibreoptic-cable for broadband Internet, digital TV, traditional telephone…

145 For now bandwidth is low using this type of access (less than 10kbit/s), but we know how fast bandwidth is increasing… .

146 In Sweden, the Government offers tax exemptions for the purchase of personal computers via employers (Financial Times, 2000). The Argentinian government hopes to boost domestic Internet use by providing US$1bn worth of low-interest loans for the purchase of personal computers (EIU, 2001).

147 Justifiable with consumer protection, this could already be started by focusing on the introduction of (at least modifiable) digital TV devices.

148 In this sense, regulatory environment is presenting more than official legal tactics. Setting the focus on open source software, would also be part of the agenda.

creative destruction of the convergence of ICT is making clear that telecom regulation has to be flexible and technology neutral, requiring more than ever before the close co-operation of industry and government. Therefore --mainly due to the advanced globalization of the private sector-- also a close international co-ordination is indispensable.

Given the fact that Latin America started late in entering the transition, the region should --in theory-- also have a "better" chance to get the macro-framework set right and enable quick and smooth progress, by learning from more advanced countries and "picking the cherries".

Financing[149]

The unfulfilled **potential** of Latin America's Digital Economy is surely cause for optimism. The region represents a sizable market of over half a billion consumers, which can be approached by mainly two very similar languages. Moreover, a significant portion of those consumers are very young, with on average more than half of the population younger than 25 years of age (51.58percent) (CEPAL, 2000). As this segment of technology savory "kids" matures and their spending power grows, the speed, at which the region incorporates and benefits from the new performance, is expected to accelerate even more. This is important to remember in order to get policy agendas right.

Meanwhile private investors should not get discouraged by **the low access penetration**, due to the fact that the relatively small percentage of people connected, is in possession of the majority of income. It will be the task of public institutions to connect Latin America's masses to the knowledge-based economy and to create the equality of opportunities, enabling all society to benefit from progress and not to exclude the "have-nots".

With regard to financing, it is essential to consider the continuation of the "high-speed evolution" and the upcoming wave brought up by the advent of digital television and the mobile Internet. In order to make best use of this **new wave** of highly dynamic economic activity on a world-wide scale, solid and serious development strategies need to be set up, with regard to the specific priorities of the countries in the region (CEPAL, 2001). Showing up well-prepared will on the one hand help to achieve a better placement on the international list of powerful investors. On the other hand, having a solid and thought-through development strategy, will help the region to profit itself the most and will avoid Latin America from becoming an uncontrollable economic battlefield between North American, European and maybe even Asian interests.

Resources are scarce in Latin American economies and therefore investment needs to be well designed and bring the maximum return possible. Obviously the surprising acceleration in the evolution of technologies that are supporting and facilitating information and communication, changed perspectives, set new focuses and impacted thinking patterns. **Budget focuses** will have to change and to adapt to the new challenges[150]. Investment and budget proposal based on priority settings elected five years ago most probably do not fit the requirements of today. Because of modifications in paradigms, priorities need to be adjusted to these "new basic conditions". That accounts for every private company, social institution (like health, education) or public institution or organization[151]. Comparing the economic power of a country to how many of its citizens are connected, we have seen that making the transition to and the integration into the Information Society is lamentably not viewed as a central part of the development strategy in many Latin American countries until now.

[149] "La región, entre otros desafíos, deberá buscar financiamiento para el razgo tecnológico." (Katz J., Ventura-Dias V., "La transición hacia una sociedad del conocimiento", Junio 2000).

[150] "I encourage Member States to review their policies and arrangements in this area ("Building Digital Bridges"), to make sure that they are not denying their people the opportunities offered by the digital revolution." (Annan Kofi, Millennium Report, 2000).

[151] Including the United Nations system!

Education

On the one side there is technology, public guidance and the financing of the process. On the other side the human being, trying to make sense of it. The development of human capital becomes key and demands extensive re-adjustment. This is based on the basic definition of the "Information-" or "Knowledge-Society", where information and the application of information (which is knowledge) are becoming the most decisive input factor. "The capital that matters most in the digital revolution increasingly is intellectual capital. …(this) helps to overcome what has been a major impediment to development- the shortage of finance. It also improves the chances for poor countries to leapfrog some long and painful stages in the development process. Clearly, the requisite intellectual capital is not universally available, but it is far more widespread in the developing world and in the transition economies than is finance capital." (Annan, Kofi, Millennium Report, 2000).

In order to benefit from this rapidly, strategies need to be developed so that a poor society can profit from it. In the business world the focus needs to be set on knowledge-based industries. Contrary to the industrial economy, the digital economy requires a kind of "assembly-line of knowledge creation", envisioning the high demands made on the life-long educational system. New, innovative educational alternatives and flexibility in study courses are demanded by the dynamics faced. This is cheap and gives a decisive competitive advantage as against the stiff and low-flexible systems in most developed countries. In general, universities in Latin America do have access to the Internet. Drastic and deep cutting reforms need to be undertaken, budget need to be revised, instructors need to re-focus their curriculums, the new and mostly already available (but often lavished) tools, need to be incorporated in every step of the educational system[152]. We have to learn how to learn and especially that we will never stop learning[153]. This is paramount in order to be competitive in a knowledge-based economy. While the world starts negotiating and auctioning over their offered and demanded knowledge-based products and services through the global information infrastructure on a global scale, it is important to not only be present, but also to be up-to-date and competitive. The vast majority of Latin American companies might already posses a computer and is connected to the Internet, yet they still do not make efficient use of the entire spectrum of the new possibilities. More efficient and tailor-made business models, applications and services, need to be developed and implemented, exploiting every single chance given, to systematically rationalize the production process, overcoming the stiff organization of industrialized institutions and coming up with new and innovative solutions to raise productivity and to enhance growth.

Often the Internet is seen as a threat. Modern ICTs often get incorporated because there is the fear of falling behind. Older people, companies, as well as governments push to get involved with modern Information and Communication Technologies, out of a fear of getting overrun, rather than seeing it as a personal opportunity to improve one's "relative degree of development". Many see computers and cables and oversee that the net of nets is actually a transparent network, becoming an omnipresent tool to proceed information and to generate knowledge[154].

In order to accelerate this process, educational systems based on traditional methods need to be adjusted and our attitude towards education re-focused. While the first mentioned challenge is a rather institutional one, the second one cuts deeper and is leading to our last focal point:

[152] Distance learning is only one powerful tool for a region with the geographical and especially economic characteristics like Latin America has. A scientific network, which is keeping educators and educational content up-dated is actually indispensable in order to keep up with the speed of development.

[153] This would justify the reallocation of the public education-budget. For example to incorporate online classrooms for small businesses, as an as fundamental part of the agenda, as elementary children education.

[154] Just like language, in its written or spoken form, is an omnipresent tool to proceed information and to generate knowledge.

Soft Factor (digital awareness)

The father of the German "Wirtschaftwunder" (economic miracle) after World War II, Ludwig Erhard, used to claim that economics are 50percent psychology. This is certainly true in a situation of great structural change. Visionary actions of individuals or groups can unfold the tremendous power of euphoria, creating a snowball effect, accelerating the onward motion[155]. IDC, for example, had to review its estimates on Latin American connectivity twice recently, due to the unexpected enthusiasm with which Latin America embraced the Internet. Their former estimate of 19.9 million people connected in the region in 2003 was getting upgraded to 30 million, and was just recently adjusted to 42 million.

More proactively pushing the Digital Culture goes beyond the provision of access, the setting of a legal framework, financing and human capital development. Setting these preceding policy issues right, is interacting with the emergence of the intangible "soft factor". Visionary creativity is required in the public as well as in the private sector. In the public sector it could be called "political will", in the private sector "general consciousness". Its powers can be tremendous and paramount for development. First of all, intellectual leadership is indispensable. It requires extensive research and the elaboration of scientific theories. Therefore large think tanks as well as universities or individual researchers are in high demand, in order to untangle and de-mystify the concept of the networked world and its Information Society. Entrepreneurial spirit became a catchword, visualizing the necessities in order to face the dynamics and uncertainties. Many companies are lacking strategy and concept in incorporating the potential of ICT effectively into their business. We know about laudable best practices, as regards to incorporating and exploiting the new performance in the health sector, in import export matching, basic education or in restructuring governmental institutions (e-government). Creativity does not know limits and can come up with impressive results. The general conscience about the new socio-economic processes needs to be high and aware, in order to be able to make use of every chance and niche that the enormous dynamics open up.

Generally speaking, this "soft-factor", "political will" or "general state of consciousness" entered a phase of maturity, after the hype. Many claim that the "New Economy" is dead after the Nasdaq crashed, and maybe they are right. The standoff between "Old- and New Economy" seems to be over, leading to a merger which is guiding us through the transition from the Industrial Age to the Digital Age, on a more solid ground. Progress might be better understandable and less mystical now, yet it has not slowed down. Remembering network externalities, the global brainstorming and the positive loop effect of knowledge creation (Hilbert, 2001a), we can expect that the pace will continue growing as more and more people get connected to the network of networks. Human kind is very flexible with this, and we will get used to this speed. Nevertheless it does not give us time to rest…

[155] This can also have negative effects, like we have just recently seen with the inflation and bursting of the high-tech stock market bubbles.

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