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E-COMMERCE, INTELLECTUAL PROPERTY RIGHTS AND PUBLIC POLICY

INFORMATION TECHNOLOGY IN EMERGING ECONOMIES

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SUMMARY:

1. INTRODUCTION

This paper adresses to public policy issues related to new technologies, specially those related to intellectual property rights at the rising of the e-commerce and e- business environment.

Deep transformation is happening in many aspects of our lives and of our world, related to emerging new technologies, whose impacts we can hardly figure.

Notwithstanding, we can already remark an increasing productivity of work and an entirely new dynamic in technological change, based in the Information Technologies (IT), among other factors.

Most of the productivity gains observed may be attributed, somewhat, to that highly increased flow of information, once a scarce resource, demanding plenty of labor and time to be managed.

The process of production, viewed as a value chain, aggregating value at each step of the productive process, becomes more and more based on information flows, eventually determining some actions at the brick and mortar level, albeit performed by machinery, increasingly automated, or human labor.

The share of building, machinery, hardware and the alike tend to decrease in the assets of the firms, meanwhile intangible aspects grow in importance.

The new way of producing generated not just a thoroughly reformulated way business is done, but also created several new opportunities and new products meeting new needs.

The role played by R&D under such conditions is increased, innovation becomes even more perceived as vital for business and the profitability of this process is undermined, in great measure, by the Intellectual Property Rights policies run by the government, and also by the environment, determining decisions of firms.

Intellectual Property (IP), which includes copyright, trade marks and patents on products and processes, has became more and more a significant asset to firms and thus, strategically managed. The result is a shift in the traditional demands on the action of government in these fields, expected to do more than protecting firms current business.

The so called e-commerce and e-business seem to be the utmost expressions of such trend, as the increasing of on-line transactions has been noticed in the fields of finance, retail sales and business at all.

Remarkable rates of increasing in the retail sales through the web, up to 100% a year, did just call attention of the public in general to a process already usual in the finance sector.

These improvements, especially in the business to business sector, seem to become further overwhelming than the growth of retail sales through the web, not just in terms of revenue but also in changing the environment and the way business is done.

In the field of microeconomics, two of the presumptions of a perfect market became more easy to be achieved, the availability of complete information and the accessibility of possible competitors in a broader marketplace, transaction costs also seem to be strongly impacted by these new conditions.

Simultaneously to the firms, in such environment of competition and change, the creation of competitive advantage and their very survival in the business are based on the way they set up information management to carry out their operations.

In other words, to succeed in the world of e-commerce and e-business, it is not enough for the firms to buy a software package to purchase and sell on-line, they have to change their management, their operations and processes and their partnerships, in order to match the new information-based production.

The role of service activities among the industry sectors increases as a whole, like the entertainment industry, whose potential in the web is so remarkable and, at the same time, is also increased the significance of the processes to economic activities.

Processes, and the way firms do business, become an important resource, and part of this is obtained by a combination of some specific factors that make these advantages unique to each firm.

Intellectual property rights, are, traditionally, set up to protect products, more than processes, which are viewed more as manufacturing processes related to products, in most of the existing legislation.

In essence, intellectual property rights are created through an institutional framework, in order to make such goods valuable economic assets and, therefore, stimulate its production and utilization through the market mechanisms.

It has also to deal with several externalities, some positive, like those related to stimulate the diffusion of creative scientific and technological works, and some negatives like

the restrictions to unauthorized reproduction and utilization of such information for further developments.

The formulation of public policies related to Intellectual Property in the Age of Information Technology, bears traditional questions related to Intellectual Property Rights on the web, like liability of Internet Service Providers, registration of domain names and aspects related to trade marks and copyrights.

It has also to deal with some more complex issues, new forms of protection for software and databases, and emerging question like the protection of business processes.

In the past, protection of industrial processes became essential to stimulate innovation but, at this moment, it cannot become a loophole in the protection of products or create monopolistic powers to firms in certain markets, by patenting common business processes when they are translated into software.

Another important aspect is the supra national character that intellectual property issues acquire, since products tend to be more and more produced and traded at global level, and even more services, delivered through the web or any other possible networks.

Finally, as the importance of Intellectual Property Rights increase in the contemporary world, to improve business productivity and competitiveness as well as the economic growth and wealth, the objectives of public policies related to Intellectual Property change.

It moves from the simple protection of those rights, by means of registration and enforcement of patents and copyrights, towards the creation of rules, in order to maximize the efficiency and welfare from the utilization of intellectual property rights in this new environment

2. E-COMMERCE AND E-BUSINESS

2.1 The Internet

The Internet development began in the late 60's by the Advanced Research Projects Administration (ARPA), a division of the United States Defense Department, aiming to connect the main research facilities, mostly universities, research institutions and high-tech contractors, claiming for safety of information and national defense purposes.

ARPAnet then was made possible through the creation of the technology of Transmission Control Protocol/Internet Protocol (TCP/IP) that provided a common language for interoperation between networks [MACKIE-MASON & VARIAN, 1996].

In the mid 80's the National Science Foundation (NSF) created the NSFnet to provide connectivity to its supercomputer centers and other general services, adopting the TCP/IP and providing a high-speed backbone for the developing Internet.

The NSF backbone was closed in 1995 since there are now many backbones, regional or mid-level networks, Local Area Networks (LANs), mostly private, around the world and also the Intranets within specific organizations. This layer structure is now blurring as many networks are becoming more interconnected directly to each other through network access points (NAPs), allowing traffic pass through them without any backbone transport.

The building up of this concept of computer networks interconnecting and managing an increasing flow of information, turned into reality the most bold foresights of the future, pushing forwards the information technology as the front edge of the present world progress.

Scientists and researchers within the academic and basic research environment first undertook those efforts. Even though they were then able to realize the extent of what they were doing, they would never expect to see their work so strictly linked to the development we can see at the present in the whole world.

Among many technological achievements, the development of graphic interfaces and electronic mailing were of essential importance to turn that network in the World Wide Web as we know today, since they made possible its spin-offs and the widespread use by anyone without requesting specific skills for that.

At pace with such process, we must certainly quote the expansion of hardware industry towards personal computing, local networks and packet switching technology, as

though the telecommunications developments that seems to become the critical factor in the near future.

Increasing demand from both the present users and its fast growing numbers made clear Internet was a communication business. In 1993 the NSFnet was paying about $11.5 million per year to run its backbone, 80% of which was spent on leasing of fiber optic lines and routers [MACKIE-MASON & VARIAN, 1996].

In fact, the emerging trends towards speed and specially the integration of systems, like data, image and voice, along with broadband and wireless communication will be the most important technological challenges for the future of Internet.

2.1.1 Internet effects

Internet is, however, far more than a technology issue, it has played a significant role in the process of social and economic transformation the world is going through. Specially because of its presence at daily life of so many people gathering them into a never seen process of connecting economic and social life all over the world.

What at the first moment seemed to be a device to improve scientific and academic communication turned into a network connecting all the society, across borders, as its exclusion patterns tend, at least in the short term, to follow almost strictly any other existing 3social exclusion patterns.

Many authors have already recognized its importance in the various fields, pointing out the idea of a moment of historical discontinuity and the rise of a new technological paradigm [CASTELLS, 99]. The ability for transactions across frontiers, approaching opportunities with more efficiency and efficacy than any other market mechanisms [KILMANN & KILMANN, 1995] and the transformations in the business world [DAVIDOW & MALONE, 1992].

The once free and anarchic cyberspace – as this was called - became part of our society as a result, that means, we can see the increasing institutionalization of the Internet to meet our usual needs. This transformation is evident when you look at the search devices, gateways and their sponsors adds, the business communication, commercial communication, and trading, not just of those contents of the web itself, but also of services and goods in general, as almost every internet user has already experienced.

Besides these multiple purposes we are discovering for the web everyday, it is worth noting the diversity of its users, that ranges from institutions, governments, banks and corporations to small businesses, NGO's, associations, individuals and whoever wants, for the entry barriers are very little and impersonal.

The way Internet is used is significant too. Probably the most frequent use is electronic mail (e-mail), then file transfer and remote login (accessing remote computers).

As of December 1994, about 32% of total traffic was file transfers, 16% was World Wide Web (WWW), 11% was netnews, 6% was e-mails, 4% was gopher and the rest was for other uses [MACKIE-MASON & VARIAN, 1996].

What we should remark, however, is the fact they are not just sending messages, searching or diffusing information, they are all, more and more, using the internet to run their daily life.

It is also important the fact that Internet does not recognize national frontiers, which means it has a global character. By saying this, we refer to the process of globalization that seems to be very consistent with Internet, for its unawareness on national authorities and for its strongly unifying cultural and economic aspects.

Globalization may be defined as a process through which the most important actions or decisions in a specific field or activity are unified in real time, at the planet as a whole [CASTELLS, 1998]. It brings also a powerful vision of future and it strongly demands for public policy and government agenda at any level, but it is not participatory [DRACHE, 1999] and its inclusive powers may not necessarily lead to an increased welfare, at least at the specific local level.

What can not be ignored anymore, is that the internet became a very important part of our lives and that it connects this society in a network never seen before, providing communication and economic and social relations in a very fast and cheap way, whose consequences we can hardly evaluate.

2.2.2. Virtual Money

The nature of money seems more likely to be translated early into information flows, and it is a necessary condition for developing trade in a global financial market and also through the Internet. However the interconnection of such networks to the Internet brings some difficulties and is a process that is just beginning.

In fact, the increase in the international trading and world financial markets evolved in pace with telecommunications as well as the banking and finance businesses were always aware of the new technologies, specially the information technologies.

The surge of deregulation of the financial markets in the late 70's came together with the evolution of telecommunications and information technologies to create a very integrated financial market at global level, one of the most important aspects of economic globalization [SOLOMON, 1997].

Proprietary networks were then created to support those activities within financial institutions, interconnected through existing commuted data transmission systems, that set up the necessary standards, and whose Spam was restrict to those institutions.

The commercial banking system is integrated either nationally, as this is in many countries or by regions as in the U.S. through a payment compensation system under supervision of the regulatory institutions.

They moved to an integration of its activities and branches in a proprietary network that made available automated services to the customers at any agencies and thereafter in many sales points, even more through the integration by the credit card system network.

At the Internet, however retail banks are offering their services as any other services, promoting their products, providing information to their clients, and delivering a limited range of services. There is some competition towards the creation of more convenient services but they seem to have left to the credit cards the role of provide the means of payment in the digital world.

Credit cards first settled a widespread commuted network (through telephone) but they are credit obligations due in the future, they evolved from a very restrict and branded market, specially in the leisure industry to a service provided in global basis by a few brands.

The credit card services achieved a great advantage from the regional restrictions imposed to banking in the U.S. The main brands were able to lock in their positions through first, the creation of a worldwide network of customers in relation to retail dealers and also a network of retail dealers in relation to banking system.

This network effect is therefore the main barrier to new competitors in this highly profitable market, able even to issue purchase power, refraining each business to issue its own credit card and imposing to those which did it, to accept the main brands too.

These advantages led credit cards to become the most usual mean of payment in Internet transactions as it is in many other types of distance sales, by telephone, mail, etc.

Dispute settlement and guarantees are also advantages credit cards enjoy, they offer customers a minimum level of confidence and even arbitrage, necessary to establish any trade relation, especially with no physical evidence about the existence of the parts, as in the case of e-commerce.

Money however does not usually flow in the Internet yet, what happens are orders to move money or credits sent through the web but whose effectuation is made through a proprietary network, kinds of inter bank compensation systems like the federal reserve.

The ability to withdraw money from a bank account through the Internet, and load a smart card or a virtual wallet in a personal computer or doing payments with a smart card through the web without participation of a financial institution remains still just a technological possibility.

Using proprietary networks aside with the open networks does not seem to restrain the expansion of e-business or e-commerce, however a main issue remains still security and privacy, as many financial data of customers are flowing through the web and being stored and handled by financial institutions.

Also important are the information exchanged between networked business that must have assured its integrity and secrecy from the sender to the recipient, as a factor even more critical than it has been until now to the electronic commerce.

2.2 E-Commerce and E-Business

2.2.1 Antecedents

The subtitle “Business Solutions through Technology Integration” from the magazine “Electronic Commerce World” brings a good starting point to define e-commerce.

It is said to be the technology that allows to connect a firm, through the use of existing information technology (Internet p. ex.), directly to its customers, employees, suppliers and partners.”[CRUZ, 1998].

The adoption of broad definitions is more likely to happen in new issues not well settled, but this may also result from the Spam of the phenomenon and also from the complexity of its implications we already can realize.

"... the world trend in the fields of communication, information technology and business is the integration of logic, material and human elements (...) and because of that, organizations are resetting their structures and operations, turning progressively slighter the barriers that separate firms, suppliers and customers" [ROSA, 1999].

Then, a major characteristic of E-Commerce definitions must be the wisdom that this is a deep transformation in the way business are done, it strikes not just the markets but the enterprises themselves.

The idea that every step in the production of goods and services can be improved comes from the nineteenth century, and has been a recurrent approach of business management. Business automation, which started in the fields of machinery, turned into processes improvement as information technologies took the stage, system analysis became the tool for designing processes to be performed with the support of those new technologies, that means computers.

These new technologies enabled significant productivity improvements like Total Quality Management and Reengineering, both related to improve processes as whole, rather than specific steps of production, an integration made possible by the information technologies.

The shift from the mainframes to client-server platform evidences there is still more than a technological shift. The search for effective integration among processes and sources of information as well as the creation of networks connecting all the steps of the productive process - all its components or even all its workers - enabled the new approaches for productivity improvement.

These developments might be also related to the new economic environment of increased competition in a global basis, which led firms to review its operations, in order to improve its efficiency and to do so through the continuous improvement of their processes, rather than through technological shifts.

New strategies for business in this environment include accessing the productive chain, identifying the value added in each step of production, the value-chain, as part of a process approach that enhances the competitive advantages within a firm and from its relations with its suppliers and customers [PORTER, 1992].

Productivity improvements addressed to global competition led firms to search for the allocation of the steps of production in the most profitable way.

An effort that includes not just a widespread distribution of production facilities, to capture the most advantageous conditions, but also the outsourcing of many parts or steps for the production of goods and even services, through partnerships and commercial relations of increasing complexity.

Developments in inventory management, like Just-in-time concept and Supply chain management [WOOD&ZUFFO, 1997], enhance the trend towards networking all the productive process in order to improve efficiency and productivity.

Therefore, developing productivity and efficiency in the actual business environment became, in fact, a continuous search for the most value added path in the productive chain, which relies mainly on the ability of firms to improve and manage its networking.

2.2.2 From e-commerce to e-business

The words e-commerce and e- business became familiar in the last days, however many people are still unaware of its significance, relating its importance to the most visible but relatively limited manifestation, the electronic commerce, or e-commerce, that means the sales through the web.

The impact of the formation of networks at the scale we witness is further more deep than is usually realized. As Alfred Marshal said back in the 20's, "The full importance of an epoch-making idea is often not perceived in the generation in which it is made. The mechanical inventions in every age are apt to be underrated relatively to those of earlier times". This is precisely what is happening and as soon as the "e" is dropped from the word e-business, in the next few years, business will have changed in a way those who were unable to follow this shift will cease to exist [KING & CLIFT, 1999].

Historically, e-business has been thought of as electronic commerce, however, E-commerce is nothing but the first step of this new networked world, promoting sales as the post and the telephone did before, with proportionally maybe, the same power. While Internet shopping is expected to generate at least one trillion dollars by 2002, e-business as a whole will soon generate many times more.

The technological ability to interconnect at low costs the networks of different firms, organizations and customers, is changing, in a very short term, the way these organizations work throughout an entire industry's supply chain, linking manufacturers assemblers, distributors, marketers and customers, at one press of a button [KING &CLIFT, 1999].

E-business is moving data and information over open and closed networks, bringing together previously separate groups inside and outside firms, improving performance by connecting disparate value chains, providing valuable information instantaneously and therefore modifying existing business processes.

Organizations will create strategic alliances and outsource functions and processes that can be carried out more efficiently by others, inter-networking will determine business strategies and the demarcations between business tend to blur.

Value chains, rather than companies, tend to compete against each other in the long term, in a modular pattern whose performance comes out as a result of its systems, connections and network of suppliers or partners, technological barriers to competition will decrease and allocation efficiency will increase.

Most companies will migrate to e-business in four stages. They will start with a web site that is the familiar window to the world of Internet, then they will integrate the business, the buying and selling processes this site is creating, into the back office of the company.

These are the obvious steps many companies are doing or have already done, with more or less success, specially at the second step, whose results are determinant for the performance of the company, and its ability to build a position in this new reality.

Notwithstanding, the main challenge of providing sound integration between operations conducted at the brick-and-mortar level and the networking process may unable firms to achieve the next steps, if they overstate its importance and sticks to this narrow idea, or to its present success.

The next step, expected for the next years, is connecting progressively the supply chain, eliminating paperwork and costs and then shaping alliances that transform the way the industry operates. Then, there will be industrial convergence, which makes possible for industries to combine expertise to provide packaged services [KING & CLIFT, 1999].

The first indication of this in the real world is the merger of television, computing, telephony and entertainment industries, to provide customers with communication packages. Many companies are, meanwhile, promoting efforts to improve alliances to network their supply chains and improve competitiveness as well as developing these operations through the integration of open and closed networks.

Of course such evolution seems not to happen at the same pace in every industry, and certainly different sectors will reach different levels in such process of networking and coordination.

2.3 Economics of the Web

"As the century closed, the world became smaller. The public rapidly gained access to new and dramatically faster communication technologies. Entrepreneurs, able to draw on unprecedented scale economies, built vast empires. Great fortunes were made. The government demanded that these powerful new monopolists be held accountable under antitrust law. Every day brought forth-new technological advances to which the old business models seemed no longer to apply. Yet, somehow, the basic laws of economic asserted themselves. Those who mastered these laws survived in the new environment. Those who did not, failed.

A prophecy for the next decade? No. You have just read a description of what happened a hundred years ago when the twentieth-century industrial giants emerged. Using the infrastructure of the emerging electricity and telephone networks, these industrialists transformed the U.S. economy, just as today's Silicon Valley entrepreneurs are drawing on computer and communications infrastructure to transform the world's economy" [SHAPIRO & VARIAN, 1999].

The rise of the information economy, as the information goods, from entertainment industries to software and many types of services, have supplanted industrial goods as the key drivers of world markets and led to the search of a corresponding new economics.

Some opinions said that in this new environment at least some economic rules do not apply. However its more useful first to search how the basic principles of economics apply to the new technological changes, and then propose some new questions.

The idea of an economy without friction, or a significant reduction of transaction costs, remains a utopia. " The instrumental rationale, stated by the neo-classic theory, takes for granted that the actors own the needed information to correctly evaluate the alternatives (...) The transaction costs derive from the high costs of information and from the fact that the parts detain information in an asymmetric way. Therefore, in spite of the actors set up institutions to structure human interactions, the outcome will always be a certain level of markets imperfection" [NORTH, 1994].

The highly increased flow of information relies on the devices that provide that flow and the treatment of these information, without whom, even though the data were transmitted, they would be worthless without some type of source to classify and organize these data and turn them useful.

What has changed in fact is which kind of information is valuable. Information goods are highly expensive to produce, to collect and classify, and cheap to reproduce. The same way, to transmit information is expensive to build up the infrastructure and then cheap to ad more user, or more information. That means information industry has high fixed costs but low marginal costs [SHAPIRO & VARIAN, 1999].

The modern developments of Information Technologies in data processing, storage and transmission, in software as well as in hardware and the creation of a network with the Internet magnitude, are not exceptions of this rule.

Information goods are experience goods, the value people attribute to information results from their experience of those goods. Then, modern Information Technologies, like personal computers and the Internet, besides other improvements in the field of telecommunications, entertainment and related industries, made more and more information available and easily accessible to a higher number of people.

This increased access to information made it more valuable, and highly expanded the demand for information goods. As fixed costs are high and marginal costs are low, prices go down and the demand increases again, pushing forward the whole process.

The system that raised to produce and circulate information this way, assembled highly competitive sectors aside with very restrict and focused producers of specific information and high-tech providers of hardware and software, protected under industrial and copyright laws, in a mix strongly competitive but interrelated at the same time.

Information then, became a commodity, to be delivered to its final customer at the lowest possible price. The increasing advantages of broadening the network, enhancing the flows of information, along with the extremely interrelated structure of the business, have been able to counterbalance the effect of lock-in and monopoly or oligopoly powers, which some companies achieved, at least on the evolution of prices.

Therefore, intermediation in e-business is a very significant part, and the way information is gathered and presented to the customer of products, the way business and the value chain are connected and managed will make all the difference.

The real opportunity is to improve the performance and the efficiency of the production and provision of services to the final customers. How management and technology will get together to face the challenge of such integration or, in other words, at which level can they bring the inherent friction of the economy?

Other important issue related to the evolution rules of this new economy is whether the mechanics of diminishing returns does apply.

The theory of diminishing returns, proposed by Marshall a hundred years ago, deals with the assumption that prices are established by the market and in the medium term tend to the average costs of production pushed by the equilibrium of supply and demand. As a result, profits tend to reduce to the average cost of capital (interest rates) in order to assure a model of economic stability.

Technological changes bring a temporary unbalance into this model, the first movers make an extra profit, that Marx called "the capitalists honeymoon", and which compensates the investments made to achieve this technological improvement. The advantage remains in, until other competitors move to the new pattern and the prices reach a new equilibrium level at the market.

However, there is a proposal that "(...) as western economies have undergone a transformation from bulk-material manufacturing to design and use of technology – from processing of resource to processing of information, (...) the underlying mechanisms that determine economic behavior have shifted from ones of diminishing to one of increasing returns." [ARTHUR, 1996].

Under this statement we can point out three important issues, an economic activity based on the production innovation, a networking and standard setting process and the increasing costs of producing innovation. Therefore, since the article was published, the idea of separation between two worlds with differentiated economic rules has blurred as much of the bulk-processing economy has also been automated and networked.

Maybe what was said to be market-failures at Marshall's times, specially those related to technological changes, that is monopolies, network effects, standards setting and lock-in effects, became more a rule than exception, and therefore more subject to market rules.

This process can be demonstrated by the pricing of goods and services in these markets, that reflects competition for broadening and strengthening networks and also recovering research and development costs more than making extra profits.

The way this new economy leverages its assets is more by heavily investing in producing knowledge to value stocks than by increasing the level of profits, even to those who have monopoly powers.

Notwithstanding the changes in the economy, economic rules still apply, the challenge is identify the right phenomenon in this fast moving world to explain correctly what is happening and then, be able to provide the analytical framework to improve economic theory and science.

3. INTELLECTUAL PROPERTY RIGHTS

3.1 Intellectual Property

The transformations in business and many human activities, which came out from Information Technology achievements in the present days, highlight the issues related to the property of knowledge.

The more the economic activity is based on both, production and circulation of information, and production of new technological developments, the property of intangible goods becomes more significant related to the total assets of the economy.

Property may be defined as the right of private use of goods and the ability of excluding others of its use. The immediate consequence of this fact is that people improved and perfectioned their own properties and relied on the state to care and rule about common and public goods, which resulted in the destruction and waste of much natural resources, like soils, forestry and fishery.

In the early developments of capitalism, property rights of natural resources were established, by the enclosure of land and rights on forestry, mining and even water. Institutions were then shaped, to regulate and enforce those property rights and to imbalance those private and the also existing common interests, highly improving the exploitation of those natural resources and promoting a more rational use of them, from an economic point of view.

Property rights of intangible goods may be, even more, at best a convention, depending on law, enforcement and some sort of discretion in establishing its limits. It differs from other kinds of property rights, because of its abstract nature.

In fact, property rights of tangible goods differ from intellectual property rights because those goods have inherent aspects that made possible to define their property as an immediate consequence of their existence, determine their limits and solve conflicts.

However the establishment of intellectual property rights was essential, for the reasons above, to support the achievements of the industrial revolution and furthermore the developments in research and development and also in communications of the twentieth century.

Intellectual property rights, as institutional framework, have evolved since its establishment at end of the eighteenth century, through different ways in different countries, according to their economic development and institutional framework.

The most important international treaties, like the Paris Convention or the Bern Convention, aimed to ensure to the intellectual property rights owners, across the signatory countries, the same rights and treatment that different local laws ensured to their respective nationals, which is called the national treatment.

Intellectual Property rights protected basically two types of rights, creative works, specially in the field of arts, protected under the copyrights, and industrial property rights, that roughly cover business names, protected under trademark laws, technological research and development, protected under patent law, and other related aspects [BRAGA, 1994].

Business secrecy and processes are still loosely protected under unfair trade practices laws, which can only be enacted when it can be proved that illicit practices were adopted to obtain access to them.

The main concern of copyright laws is to grant to the owner the right of authorizing reproductions of the work. Under this nature of protection are also published basic research and software developments.

These rights permit at one side the control of the use and contents attributed to the work and, at the other side, to impose fees on the reproduction, in order to generate the necessary economic compensation for the producers of artistic and creative work.

Trademarks protect business names and other distinctive characters from unfair use, defined as a kind of use that may harm the public image of a business or product, take some undue advantage of the use of that public image or bring the public into confusion. Therefore, this also makes possible to impose fees and controls on the use of the trademark by third parts.

Patents protect research and development of products and processes that have some practical appliance and bring some non obvious innovation to the "state of the art" technologies. It provides the right to impose fees on the use of patented contents and provides also the disclosure of information, which otherwise would be kept secret, and by doing so, it contributes to enhance technological progress.

Industrial property has also included under protection Utility Models, Industrial Design and Geographical Indications, creating a framework to make valuable a set of important achievements that enhances business and, therefore, economic performance.

Assuring intellectual property rights to private owners or producers of science technology, arts and communication works, makes them valuable assets that are worth to improve and also to bring them into economic exploitation.

Other ways to promote technological development and artistic creation may be proposed, but they would hardly avoid emulating market-friendly mechanisms of performance-based incentives and rewards.

In a capitalist economy, based on free enterprise, whose growth is increasingly based on technological development, intellectual property right is not just essential to promote technological development, but to turn it into effective economic development.

The importance of intellectual property rights is therefore, more comprehensive than reward the creative, scientific and technological works. It is the transformation of them into valuable economic goods, able to be exploited in its full possibilities by the economic agents and produce economic growth and technological development.

Those intellectual property rights are created through an institutional framework and, of course, should not be viewed as either an inherent or a precisely defined right. Therefore, the efficacy of their conversion in economic goods and the efficient exploitation of their value are, at most, based on the public policies and legislation related to intellectual property, that, in fact, compose this institutional framework.

3.2 New Issues on Intellectual Property

A most significant characteristic of intellectual goods is their networking effects, and according to the level of intellectual property rights protection is the level of disclosure and access to research and development data and even to scientific and artistic works.

Network effects enhance technological development, as more information is available. These information can be related to others promoting a broader diffusion of information, creation of related new applications and new researches, leading to improvements in the former invention or to new inventions.

There is significant evidence of the network character of technological development [WRIGHT, 1997], and it can be easily related to the evolution of intellectual property rights and just by the end of nineteenth century, international treaties tried to promote this networking among the signatory countries.

The growth of international trade and furthermore the processes of globalization and economic integration came along with huge development of information technologies and knowledge-based economic sectors, that highlighted intellectual property issues in the recent days as well as new issues came out.

New technological achievements demanding new forms of protection, the so-called "sui-generis" protection like Integrated Circuits for computer industries, Breeder Rights on varieties of plants and animals, inventions related to microorganism and genes and, more recently, the protection of data basis.

At the other side, in pace with globalization processes, international trade and investment, the ever present question of improving coverage across countries, and setting standards of protection and enforcement have been strongly stressed.

Intellectual property is addressed in different ways and at different levels in different countries, according to different traditions, economic and political interest groups, and capabilities, but its importance has increased with the rise of this new economic environment, in which information and technology play a major role.

A very clear evidence of this importance is the fact that one of the most important outcomes of Uruguay Round of the World Trade Organization – WTO, was the "Agreement on Trade Related Aspects of Intellectual Property Rights, including Trade in Counterfeit Goods" – TRIPS.

This international treaty, outside the bounds of World Intellectual Property Organization – WIPO, settles minimum standards of protection to all the parties, in a way far more comprehensive than ever before.

Even though many aspects of ethics or environmental questions have been raised in the last times, it is all about making intellectual property an economic good, which involves conflicting interest groups and the classical model of diffused benefits against concentrated short term losses [OLSON, 1992].

The proposition that loose intellectual property rights protection will help a country at the initial stages of technological developments is not sustainable. It brings distortions to the rewards of investing in technology and, by increasing the hazards, increases the prices of technological products at global level and therefore, reduces investment.

Reduced costs for licensing patents, under the threats of reverse engineering leads, in the short term, to reduced costs of products and higher profits to local producers [VISHWASRAO, 1999] but does not assure investments in technological development and reduces incentives to technological transfer.

Then, to provide incentives to reverse engineering can hardly be seen as a sound technological policy, because in creates protected sectors without incentives to undertake consistent R&D in the medium term, and diverts resources that otherwise might be well applied to real research instead of reverse engineering.

Tropical diseases treatments and pharmaceuticals show a tremendous backlog in relation to other medical research areas because public funded research, which tends to be mainly basic research, will never be able to replace private investment in R&D to bring new products to the public.

A process improvement approach to promote technological development [CUSUMANO, 1991] can not also be related to loose intellectual property rights. Enhancing technological capabilities, in this case, demands strong public policies to overweight the weak property rights regulation and enforce the established economic interests on counterfeit goods to invest in R&D.

Three sets of new challenges for the intellectual property issues seems to be rising for the next years, the development of new technologies, the transformations in the economic and trade environment across the world and the transformation of intellectual property rights and its role in the contemporary industries.

The first aspect is related to the creation of new kinds of intellectual property protection, to address new technological achievements, like integrated circuits or biotechnology.

The existing achievements whose importance increased with the new technologies also demand for especial protection, like data collections, whose contents is non-proprietary information arranged and made available in a unique and valuable way.

All these fields demand the so-called "sui-generis" protection, which means new public policies and new regulation. Not just to ensure certain level of control of their use by their owners but, primarily, to ensure the efficient economic use of those goods and their best contribution to technological development and economic growth.

The second aspect is related to the process of globalization, the increasing in the international flows of goods and services and more open economies, whose consequence is a more comprehensive approach to technology transfer, the creation of networks and more integrated R&D.

Other significant outcomes were the efforts to imbalance different national policies on intellectual property rights in substantial aspects, through treaties like the TRIPS, which determined significant changes in the IPR regulation to each member of WTO.

The third aspect is the increasing in the economic role of intellectual property as an asset of corporations and firms [RIVETTE&KLINE 1999], pointing out the changing in the traditional approach, in which IPR, specially patents, were to be held in order to protect the business against competitors.

The new trends are towards a more comprehensive approach, which considers patents as tradable assets that must flow throughout the economic environment, in order to reach its most efficient way to aggregate value and generate wealth, by transferring or licensing.

Recent mergers and takeouts in the high-tech sectors have shown that they were driven mainly by intellectual property concerns [RIVETTE&KLINE1999], even the rise of Nasdaq index, partly reflects the dispute for positions on intellectual assets, expected to be valuable in the near future.

However, as intellectual property rights have not yet found its real signification to many firms, its essential strategic importance to some businesses is neglected, and, as a consequence, these rights are not well managed in order to reach its more valuable utilization as economic assets.

Many patents, resulting from R&D investments of firms, which occur not to be at their core business, may be left aside instead of brought into economic exploitation by licensing or other ways, in a situation which just begun to be reversed in recent times.

The modern information technologies also raised a set of new questions, because they reduced at unpreceeded levels at one time both, reproduction and diffusion costs, [SHAPIRO & VARIAN, 1999].

This kind of change stresses the traditional view of intellectual property rights, which, like other property rights, enables the owners, at their own wisdom, to determine the conditions of the use of some aspects of intellectual property.

Its important to underline that this protection is achieved at the expenses of the public and, maybe, not in the most efficient way, from an economic point of view.

In fact this has been an unsolved dilemma in the intellectual property rights policies, for long time, as piracy existed since those rights were created and, in many cases, these unhautorized diffusion and utilization led to expansion of the market and of the whole industry [SHAPIRO & VARIAN, 1999].

This fact suggests that there may be an optimum of protection to be provided to intellectual property rights, some kinds of uses that must be permitted, or not publicly enforced, in order to reach the best economic and social outcomes of intellectual property rights protection.

Of course this optimum must be far from produce effective damage to the owners of intellectual property rights as well as to the incentives for investing in R&D and in other kinds of intellectual production.

It must, however, facilitate the diffusion of information as valuable by itself, promoting network effects and spin-offs for intellectual products, also reducing the risks and conflicts that have increased lately between new creations and the established intellectual property owners.

The increasing importance of technology associated to other intangible goods, like the entertainment and communication industry, stressed the traditional approach to the intellectual property rights, however maintaining its fundamentals. A set of new issues of high importance to the global economic performance rose aside with the traditional ones, which are far from being resolved.

These issues, as matter of public policy, are subject to many interests and different proposals and objectives. Therefore, they must be addressed in a way to reduce conflicts and promote incentives, not just to the intellectual property creation, but also to its trading, diffusion and spin-offs.

It is a main concern to keep in mind the externalities and other economic aspects, in order to achieve the institutional framework at the global level, able to obtain the most valuable outcomes in terms of welfare.

3.3 Intellectual Property Rights at the Internet

The aspect that makes information goods unique is the fact that they are experience goods, people can not evaluate how it is worth to them unless they experience it [SHAPIRO & VARIAN, 1999].

The willingness to pay for a book, for music, a play or any kind of idea, comes from the experience of it. To create some value for information goods you have to give away some kind of free sample, in order to create the necessity in the customers, and in many cases, the more customers you have the more valuable for each one is the information good.

The difficult reproduction and diffusion of the products undermined the economic exploitation of information goods, meanwhile the unauthorized use of reproductions could easily reduce the income for the owner as information and reproductions were scarce.

The digital technologies made possible the reproduction and the diffusion of information products at a very low cost. It reduced the costs of reproduction, in a level never seen before, which from one side threatens the owners of intellectual property rights but, from the other, makes cheaper sending samples to potential customers to get access to very huge markets.

Entertainment industry has been one of those which most benefited from these new technologies, as it has gained powerful instruments to expand its range of customers and products at very low costs. They are, nevertheless, the most concerned about copyrights, reproduction and piracy on the web.

They do have the right to control the use of their own properties, from a strictly legal point of view, but which is the real damage they are suffering? Which are the social costs and externalities of the enforcement, at the level they desire, from an economic and social perspective?

Copyright owners tend to demand the highest level of protection, even though this level of protection is not the most efficient in economic terms. They also try to transfer to the public their own obligations, in order to exercise those rights. So, public policies should keep private the main obligations and solve conflicts within the existing institutional framework.

The enforcement of the intellectual property rights leads to the discussion of the liability of those who transport and store, even though involuntarily, protected contents, in other words, the Internet Service Providers.

It is not difficult to accept that providers are not responsible for message contents, as other communications service providers have not been. Gateways, however, guide people to homepages across the world which may bring unauthorized protected contents available for download, like music or movie records, books, magazines, pictures, etc. even for commercial purposes. It is clearly an illegal activity, to be strict, however it is from the nature of the gateways.

They are created to provide open access to websites, and they can not control their contents. Notwithstanding, they are the more accessible targets for those who have their property rights harmed, as the responsible sites may be anywhere in the world, under the most diverse and unpredictable legal systems.

In spite of the uncertain efficacy of liability enforcement on the Internet Service Providers, related to intellectual property rights, the main concern, however, remains the fact that it creates more conflict and increased costs, reducing, therefore the speed of its growth.

Exclude providers from liability is already a consensus, provide the gateways with regulations able to set the limits of their liability to contents of sites they access may be subject of discussion.

As technology improves and more of these kinds of products become available through the web, more conflict and significance are likely to be brought to this question

Policy makers seem to be engaged in preserving this gold rush, by ensuring that no change will occur in the short term in the absolutely free environment players were graced until this point.

Other conflicting issue is about domain names and trademarks. Trademarks are distinctive signals of a business, protected under intellectual property rights, domain names are registered within the Internet environment to designate websites.

Trademarks have their characteristics and distinctiveness determined easily, meanwhile domain names are just words, which can be related to existing trademarks, either intentionally or not.

The most obvious misuses of domain names related to protected trademarks have been refrained by Internet authorities in each country.

Three main sources of conflict, however, may be pointed out, different jurisdictions on trademarks and domain names, application of national criteria to domain names used worldwide and the range of possibilities of correlated names, which may be confused with existing trademarks.

Therefore, many of those struggles tend to resume at the double jurisdiction field, which needs an harmonization to smoothen the conflicts and to enable the setting of rules which ensure reasonable trademark protection in the internet and create conditions to address international issues in a consistent way.

The most outstanding issue about intellectual property rights at internet came out with the rise of e-commerce and e-business, and is related to the trend of connecting business and value chains through the open network, it is the patentability of business processes.

The traditional approach stated that this kind of knowledge is not either innovative or original, and its improvements come from unique characteristic of firms and so there is no reasonable argument for protection of this knowledge.

Notwithstanding the increasingly significant role that process improvements have played, not just in industry but in every economic sector, the experiences were unique and the diffusion of those ideas, more than harming its creators, helped the cultural changes needed to promote this new approach of production.

Computerizing business, especially after client-server architectures, widely promoted process improvements, as far as the activities performed were more and more related and managed as information flows.

The trend for business are, as it was said before, to become organized by networks meanwhile production tend to be organized no more as individual, firms but as productive chains in which several firms are interconnected. Therefore, processes become a key factor for business in the near future and the way they are organized is based more and more in software features.

The translation of basic business processes into automated and software driven processes, and further the claim of intellectual property rights over them, is one of the most critical issues for the growth of e-business.

Software is protected under copyright laws, but the business process within them, even though bearing some improvements of traditional methods, most of them obvious but just enabled through the modern tools, may bring some dispute.

These disputes are mainly related to the question whether these aspects are also subject to protection under the traditional intellectual property rights, as software or business process.

The main question is how to differentiate both, software developments and process improvements, and create an institutional framework able to put together the copyrights that address to software and the industrial property rights related to business process, which need to be reviewed to match this new situation.

There are so many significant and urgent questions but the main concern in the debate addressing regulation and public policies for the Internet is, until now, the willingness to preserve its fast growth at any price.

Of course the advantages of first movers can be appropriated at national level too, and the increased costs, which may be a necessary outcome of public policies might impact the expectations of economic agents, and the strong economic growth of the sector, bringing incentives for public officials to stay apart.

Proposals supporting self regulation bring the problem of the rule of the bigger players and may also create some distortions in the future, as common rules may overwhelm economic rationality and disrupt the process of increased networking we are witnessing.

Anyway, if e-business has to become as important as it seems it will be, public policies are immediately necessary, at least in the field of intellectual property rights, in order to ensure fair practices and rules, reducing the costs and risks which are rising from the present rules.

4. CONCLUSION

The internet is bringing deep transformations to our lives, creating an open network whose most remarkable aspects is its widespread character, the fact that these technologies are easily becoming accessible to more and more people around the world.

These changes have been moving this world into a society more and more based on knowledge and services, as it has improved industrial productivity and reduced its costs in a way that made them loose their core position in the economic world.

E-commerce is just a preview of what is going to happen in the economic environment, e-business means a complete reshaping in the way business are conducted, as it enables the networking through different firms in an accessible and efficient way.

Transformations are expected in the business processes, highly improving automation and networking and also a change in production organization, no more around firms but according to different productive chains or value adding chains.

Technology is part of this process, but not all the process, these transformations are accessible to anyone and bring a significant opportunity to developing countries, as much of this technology was already transferred and the conditions to improve productivity and efficiency are given.

The challenges are common to the developed and developing countries, and reveal unpreceeded openness. The opportunity to achieve better positions depends on the accuracy of the policies adopted and on a good partnership between public and private sector.

The current situation provides few incentives to set up rules or public policies, however, the lack of coordination will probably cause some distortions and, specially bring into place the rule of the stronger, which is not desirable for developing countries.

Sound public policies, able to expand Internet and improve advances in networking and e-business, to take full advantage of this new environment, might ensure developing countries a unique opportunity to enhance their competitive advantages and their economic growth.

Infrastructure improvements are required to support the increasing demand for telecommunication and Internet services, which can be easily provided by the market if a fair regulatory environment is provided.

Adequate regulatory framework, as the questions related to internet and e-business have just began to be considered, will ensure to those countries who are able to create the most friendly and efficient framework, a significant advantage in the near future.

Coordination of industrial and business policies, in order to smoothen the transition to the new business environment can also enhance competitiveness and create advantages in the developing countries.

Intellectual property rights in this new environment becomes an important issue and by proposing consistent public policies in advance, developing countries may settle valuable positions to take the most advantages, the logic of first movers rules here again.

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