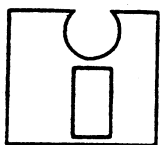


WIPO/IFIA/BUE/00/2

ORIGINAL: Spanish

DATE: September 2000



INTERNATIONAL FEDERATION OF
INVENTORS' ASSOCIATIONS
(IFIA)



WORLD INTELLECTUAL
PROPERTY ORGANIZATION

INVENTORS AT THE DAWN OF THE NEW MILLENNIUM: WIPO-IFIA INTERNATIONAL SYMPOSIUM

organized by
the World Intellectual Property Organization (WIPO)
and
the International Federation of Inventors' Associations (IFIA)
in cooperation with
the Government of Argentina
and
the Argentine Association of Inventors (AAI)

Buenos Aires, September 5 to 8, 2000

HOW THE INTERNET AND NEW INFORMATION TECHNOLOGIES INFLUENCE
THE WORK OF INVENTORS, INNOVATORS AND INNOVATIVE SMALL AND
MEDIUM ENTERPRISES (SMES) (MULTIMEDIA, WEBPAGES, MODELING,
PROTOTYPING, COMMUNICATION)

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How the Internet and modern communication technology influence the work of inventors, innovators and small and medium -sized innovative enterprises

INVENTORS

Inventiveness

1. Inventiveness is a creative discipline founded in the imagination as an essential element for dreaming, imagining and conceiving; in science as the sum of knowledge necessary for evaluating, examining and deducing; and in technology as the combination of instruments, procedures and methods for experimenting, correcting and undertaking.
2. In the words of my father, inventing is “seeing what everyone has seen and thinking what no one has thought.” The imagination is an essential factor in creating something new. Creativity in all fields is based on imagining, setting and resolving, in a practical manner, the equation conceived in one’s dreams.
3. Man dreamed of flying, seeing in the dark and communicating from a distance long before these inventions came to fruition. The only people capable of achieving this were those who managed to see in birds what everyone had seen but what no one had previously thought in the aerodynamic qualities and engines necessary for flying, those who observed in the force of lightning the radiance of electricity and contemplated how to capture it and perpetuate it in the form of an electric light bulb in a vacuum, and those who discovered in the wave scattered by a rock that fell in a pool the symmetrical circular diffusion of energy, and planned its application in electronics as an appropriate vehicle for disseminating sound, pictures and information.
4. Inventiveness creates scepticism. All forms of technological progress are feared, challenged and even rejected at the time of their appearance. All forms of innovation cause irritation because they disturb the established order.
5. An inventor’s vocation is based on the idea of benefiting humanity. His enthusiasm yearns to see his ideas and inventions developed, and thus to be able to pass on concrete results with which to improve and simplify the lives of millions of people.

Profile of the inventor

6. When inventors are spoken of, generally men such as Thomas Alva Edison, the creator of the electric light bulb and more than twelve hundred different inventions, come to mind; as well as Leonardo da Vinci, the renewer of art, science and universal knowledge, and discoverer of the basis for developing technological innovations in all fields; Guglielmo Marconi, inventor of the wireless telegraph and father of broadcasting; Johannes Gutenberg, creator of printing. In Mexico, mention is made of my father, the engineer Guillermo González Camarena, inventor of the world’s first color television system. Very few people, however, know what inventors are actually like.
7. Inventors are ordinary men and women who possess an extraordinary gift, and are generally unknown and yet present at every moment of our lives with their talent and creativity displayed through their works: in genetics, forms of transport, telecommunications, physics, medicine and, in short, everything that makes life ever better, more comfortable,

simpler, healthier and more sustainable. It is the inventor who creates the means by which humanity is able to control its environment and transform it so as to make use of it. h

8. Inventors combine imagination, talent and boldness in a mixture of skills capable of ignoring established ideas in order to show the worth of what is exceptional. Intuitive, inquisitive and incurably abstracted, an inventor defends his creative space in a ascetic isolation from the rest of the world. His mind is the laboratory in which ideas struggle with laws and knowledge in the effort to rework paradigms. It is the clash between pure essences in a sterile environment, sealed off from unfortunate contaminants. It is a feature of appropriate affinity with modern communication technology.

9. Historically, an inventor invested more time in the waiting rooms of entrepreneurs, executives and civil servants than in workshops or laboratories. Inventors, usually ignored, frequently rejected and forever misunderstood, seek among political, economic and social authorities a visionary partner who can provide them with the opportunity to pass on their work to mankind, in the paradoxical role of hermits forced to do business. Unfortunately, with rare exceptions, this search is never successful.

GLOBALIZATION AND THE INTERNET

Globalization

10. At the dawn of civilization, in the first sedentary cultures, the closest thing to a border was the territorial area that the man-animal could embrace with his gaze and control with his strength. Individuals, families, groups, and subsequently tribes marked their *inherited territoriality* by shouting and using weapons. We have undoubtedly come a long way since.

11. Then came feudal states and the rise of the nation-state, designed to transform everything and “put things in order.” As a result, different kinds of border were created and transformed into an expression of the measure of wealth, material possessions, ownership of land and fortunes, as witness the Berlin Wall, and then the new and modern “partitions” separating Mexico from the United States, which those without papers choose to crawl under rather than jump over.

12. States that we label as modern agreed to adopt a heavy-handed approach, and invented new border concepts: the First World War led to the collapse of the Austro-Hungarian Empire and forced new nation-states into existence. And so began the twentieth century. Since that time borders—as Winston Churchill put it, glass of whisky in one hand and pencil in the other—have been lines that the politicians of victorious countries draw on maps of their defeated enemies.

13. History is full of examples: the whole of the region we now know as the Middle East was shaped in this manner. The map of the two Germanys has nothing to do with the desires, culture and soul of their peoples, but with the results of battles. A line drawn on a map separated the territory of Texas from Mexico, and the defeat of Santanas snatched Upper California away from it. The Empire of Gran Colombia suffered all the changes brought about by internal war and still remained part of Bolívar’s impossible dream.

14. The Chaco War left lines on maps and scars on Bolivian and Brazilian bodies.

15. What was once Africa as colonized by Belgians, British, French and Italians became liberated Africa, with different names for its countries and different borders, which were no more than arbitrary divisions. The victors of the Second World War took pleasure in settling their business: Stalin helped himself to Estonia, Latvia and Lithuania, as well as many other countries. France, Britain and the United States were left with half of German, while the Soviets had the other half; and to capitulate, without knowing what to do with the group of peoples of different ethnic background and religion, opted for yet another patchwork under the name of Yugoslavia, which grouped together Serbia, Croatia, Slovenia, Bosnia and Herzegovina, The former Yugoslav Republic of Macedonia and Montenegro. The painful and absurd result is well known to us all.

Communication

16. But why do we gather together, in sports' stadiums, at the concert halls? We meet in order to communicate with each other. This is perhaps because the only situation that man cannot tolerate is solitude. By their very nature, human beings gather together in increasingly large communities in order to share their differences and see whether they can find ever more common bonds. They do so because they wish to see in the future the distant prospect of becoming a single world, a single nation, an enormous single community, lending ever more reality to Marshall McLuhan's vision of a global village.

17. Paradoxically, globalization can be achieved only if natural borders are the result of natural, intrinsic differences rather than being imposed from the outside. These natural borders are those which are most easily transformed by the process of transculturalization, the basic instrument of which is communication, evolving as it does into a mutual commitment to convey and to receive.

Communication with globalization

18. Electromagnetic waves do not recognize borders, and for half a century have been the main factor of global rapprochement, foiling the tricks of politicians and ever-present behind the successes, desires and dreams of human beings. During the Second World War, which marked the high point of broadcasting, millions of Europeans knew what was happening in their own countries thanks to the programs broadcast in various languages by the BBC in London; even the Germans obtained information from those broadcasts. Goebbels ordered the bombardment of the path of the radio waves with aluminium foil so as to jam them, but to no avail.

19. During the Cold War period the phenomenon was repeated, with other radio broadcasters operating on different bands: from Munich *The Voice of America* and *Radio Free Europe* told prisoners behind the Iron Curtain all about the "wonders of the free world and capitalism." From Moscow, Berlin or Prague, *Radio Moscow*, *Radio Berlin International* or *Radio Prague* said the opposite: Socialism was the paradise of the working class and Imperialism was a dying concept. A radio station called *Pirenaica* tried to bring down Francisco Franco by means of radio messages.

20. However, apart from the political content of broadcasting stations, the truth of the matter was that, beyond their borders, people were communicating. The politicians have been consigned to history, but civil society and communication media are still with us.

21. With the arrival of television, this phenomenon gained in intensity owing to the enormous multiply in power of the medium. At the same time the current cyber-revolution has added personal experiences, situations, moments and unsuspected expressions to this backdrop in recent decades. Foreign-language dictionaries cannot keep up, and *celular* (meaning cell phone), *email* and *chatroom* are already well-known adopted expressions.

The Internet

22. When we navigate the immense seas of the Internet, we access data banks from anywhere in the world with an immunity that a burglar would long for, and we talk about e-mail as once we talked about catching the bus, sending a fax or receiving a PIN number over the telephone. Cyberspace has managed to shrink even further our already shrunken planet.

23. In the human being of the new millennium, the social urge for greater integration has been strengthened considerably. This is a trend towards integration in the global village, above and beyond nationality, ethnic origin and even language. Radio established its unifying power first, then television played a decisive role in the process, but it is undoubtedly the Internet that has since substituted its name for all others as the great integrator. The receipt and transmission of multiple, accessible, updated and processed data, in addition to its unusual virtue of allowing interaction with the data, endows it with ideal attributes. The omnipresence of computers is a reality, and their potential for global distribution and influence is virtually unlimited. Despite its recent appearance, the Internet becomes more effective day by day as a result of its increasing number of users. This merely illustrates the vital need felt by human beings to gather together and communicate.

24. Within this colossal process of integration, the adoption of an individual approach to the use of the Internet serves both as a link and as a genre in itself. The immediate availability of various types of information, combined with the possibility of establishing individual communication, as well as conducting a dialogue, all this confirms the immense potential of the Internet. Suddenly, human knowledge exists with the exuberance of a personalized range of virtual values.

25. People are still learning to use and make the most of the Internet. The arsenal of available information exceeds all initial attempts at systematic navigation. It can thus happen that, while searching for protons, after three hours we find ourselves immersed in the study of the reproductive habits of the white rhinoceros, to cite one example.

26. However, it is the very independence, individuality and incompleteness of free will that gives specific form to the infinite range of its applications; it offers the advantage of being able to discuss pure science in a state of private, intimate introspection.

27. It is here that the vertex of unconditional convergence in the relationship between the Internet and the profile of the inventor is located. It is an instrument that can explore universes within the restricted confines of a laboratory; it is an inexhaustible stimulator of the imagination that is sealed in privacy; a search and consultation tool which exceeds all expectations; an efficient financial adviser and honest provider of funds; an invariable supplier of input and technology; a supervisor of intellectual property moves; a universal promoter of projects and, finally, a reliable marketing agent, exporter or distributor.

COMMUNICATION AS PART OF INVENTIVE ACTIVITY

Ideas

28. Perhaps the only restriction to which the stimulation of the imagination to generate ideas can be subjected is the perimeter of its frame of reference. In other words, as access is given to new horizons, knowledge and contexts, an increasing number of scenarios and areas of development will be detected. In this sense, the sphere of inventive activity is generally developed around an innovator's immediate environment. Nowadays, however, since information is a primary commodity and possibly that which generates the greatest demand and market circulation on the planet, the frames of reference have been extrapolated and increased through the involvement of all media, in contrast to the previous territorial conditions.

29. The role played by restricted access or pay-per-view television has been vital. With the rise of various specialized channels broadcast worldwide, such as *Discovery, World, Arts and Entertainment*, and many others, the stimuli for the imagination have reached a wide audience. The talent of creativity cannot be considered an exclusive category, and its fibers can be activated and can develop in a moment of inspiration in response to a specific stimulus. The function of television as a single path signal is therefore restricted exclusively to the display and animation of responsive pluralities. Thus, the motivation which it creates arouses interest, thereby generating professional enthusiasms in certain cases, search and research in others.

30. The universal abundance of information inevitably converges on the Internet. Cinema, radio, the press and television meet on the information superhighway and apply their exceptional power of fragmentation in order to disseminate, promote and analyse its contents. A old-fashioned term, which is now back in vogue, serves to define this expression of modernity: convergence. The frame of reference is gradually acquiring immeasurable proportions. This confluence of conceptual diversities stimulates the imagination in unexplored areas of consciousness, and thereby invigorates the will and injects ideas into the most fertile culture medium. Finally, this gives rise to the creative process which will set and resolve, in a practical manner, the equation conceived by means of inspiration.

Precedents

31. While the legitimate premises of integrity are understood, the prelude to embarking on the development of any kind of innovation is research, including the search for possible precedents so as not to waste time on pointless effort. Partly owing to the involuntary inadequacy of institutions in recording and disseminating effectively the timely publication of patents and recent innovations, or as a result of the incompetence and, in certain cases, the negligence of not refining personal tracing methods, certain honest inventors may innocuously duplicate the inventions of others, or possibly commit timely and fruitless transgressions. Whatever the case may be, the waste of talent, effort, time and resources is regrettable.

32. Nowadays, in exceptional cases, occurrences that can be attributed to ingenuousness in the area are virtually unjustifiable; refusal to establish links and consult automated resources containing existing data, and to exhaust all possibility of cloning before initiating an elaborate innovation process, is devoid of all logic. The undertaking of any innovative adventure will always be suspect unless a vast and reliable frame of reference has been established

beforehand. What is worse, ignorance or indolence? An imbecile would respond: "Well, the thing is, I don't know, but quite frankly it doesn't matter..."

33. Many details undoubtedly remain to be clarified as regards the registration, publication and disclosure of patents in an open environment, on the basis of specific and well-defined confidentiality. Firstly, the areas of distribution and those responsible for the contents must fix their positions in that regard. Current national and international legislation relating to communications and intellectual property must also be adapted to this new procedure.

34. As regards the Internet, the rigid nature of structures forming legal systems has meant that the law has not advanced in line with the development of technology; however, the organizations responsible for the promotion and protection of intellectual property have devoted themselves to the task of searching for, or as the case may be designing, appropriate tools and strategies with which to enforce the exclusive rights of the holders of inventions, industrial designs or copyright.

The invention process

35. Inventions are applied on the basis of a disagreement with, and never is commonly believed in consensus with, scientific knowledge, which is invoked for the purposes of consultation and not in the search for solutions. An inventor demolishes paradigms and pits his innate capacity for lateral thinking against the one-track mind of the experts. The examination of archetypes confronts it by adopting a pragmatic and questioning approach. According to Edgar Morin, information is a problematic concept in itself rather than a source of solutions. It is an essential phenomenon, but is not as yet a clear or explanatory expression.

36. Computer navigation on the Internet as a form of support for inventive activity refines sensitivity to the diversity of available information and strengthens the ability to tolerate the immeasurable. Legitimate hypotheses regularly refute paradigms and the scope of a relative frame of reference acts in a correlation directly proportional to the efforts made to dismantle or modify such paradigms. Speculative tests increase exponentially and this in turn substantially increases the possibility of venturing a larger number of alternative suppositions.

37. Discovery is taken to mean the fact of having detected a certain kind of material or phenomenon which already exists in nature, while an invention entails the creation of a type of mechanism or technological device that has never existed. Within this context, the advantage offered by the investigation of discoveries on the information superhighway invariably provides new dilemmas for those involved in invention.

38. At the same time, applying the capacity of interaction and taking advantage of the different cyber-modelling and experimentation tools available on the world wide web at an affordable cost, such as the various calculation, drawing, design, multimedia, prototype - digitization and construction programs, is conducive to the making of suitable proposals for defining diagrams and research, application and manufacturing protocols.

39. In a different area of concern, the systematic exploration of additional auxiliary procedures and technology for the execution of construction processes and proposals undoubtedly generates fresh notions in the application of solutions and at the same time creates the real possibility of achieving significant savings in terms of time and resources.

“Innovation”

40. On the long, difficult and at times disappointing road that must be followed before an idea, discovery or invention can be used, we stumble across a whole range of interests, successes and failures. Copyright, patents, royalties, inventions, technology transfer, economic development, industrial espionage and plagiarism, patent legislation, research funding, the purchase and sale of processes and prototypes, the remuneration of researchers and inventors, and the ever greater technological dependence of the third world on the developed world, all put a brake on the enjoyment today of what so few thought up yesterday for the benefit of so many.
41. “Innovation” is a term coined by the Mexican engineer, inventor and researcher Amado Santiago. This term endeavors to encapsulate in one word the multiple support tasks that an innovation needs before it can become a commodity.
42. The main thing is to regard technological novelty as merely a consequence of the invention or discovery, which may only remain in its primal state if it is not subjected to the process of “innovation” so as to be transformed into a consumer innovation. Technological novelty does not survive in its own right and is of no use unless it is “innovated.”
43. There are two parameters that condition the concept of “innovation” in a particular manner. One is continuity of effort and the other one is change. Although these factors appear to be contradictory, they are in fact closely linked and cannot be considered separately, and the success or failure of what follows the invention depends on the way in which they are handled. Both concepts sum up the unlimited potential of the Internet.
44. The ever-present search, consultation and communication capacity makes the Internet an appropriate means of practising “innovation.” Policies for the future should be planned on the assumption that the most likely outcome is that the Internet will change continually according to the available frames of reference and resources, and the aims fixed will be characterized by their changeable and temporary nature. The capacity for change in the “innovation” policy must be permanent and immediate. For that reason, the aims must be partial and periodically adjusted to the current technological moment.
45. In “innovation” it is essential to crystal-gaze. Forecasting the future is such a risky undertaking that it should be constantly possible to effect changes in the options for technological innovations and thereby modify what currently exists so that the products of the future do not become obsolete and worthless. Permanent information is fundamental.
46. Placing innovation in a temporal context is the principal task of “innovation” and certainly the most complex and difficult, as well as being the one which will face the most obstacles in the future.
47. Many of the current ideas cannot be incorporated in present-day society, but will be useful in the future. And yet in the not too distant future they will become obsolete. This idea is difficult to understand, above all for those who view the world of the future in terms of the economic and social foundations of the past and present.
48. Technological innovation must develop and increase in a favorable environment, and creating such an environment is extremely difficult. In Mexico, for example, it would be

necessary to shift several gears down for the technology and innovation lag not to have the effect of a bull in a china shop.

49. Technological innovation creates technology, and if it is “innovated” – that being a necessary condition – it produces and increases innovation in its turn. “Innovation” forms part of a chain; it is a link that conditions the use, consumption and creation of change. Through change, innovation has transformed our habits and customs. Innovation gives added momentum to forms of thinking that condition education and our social relations. The coming years will bring with them such diverse changes that the major problem will be to choose some of the many options we will have, and the most likely outcome is that we will do this incorrectly. “Innovation” supported by information may help to reduce this risk.

50. This vortex of communication at the beginning of the new millennium is both the promoter and the manager of change, the detonator and the cushion, the innovation and the result. The lack of balance and adaptability that innovation will cause will have consequences for the march toward the future, indeed it is already beginning to have them. As has always been the case, change encounters two opposing currents: those who yearn for it and those who fear it, but who help create it through the consumption of innovation.

Inventors.com

51. Ever the orphan when it comes to support, an inventor suddenly finds himself with power and control over the most powerful tool on the planet. Thus far we have seen the viability of computers in terms of the information, experience and programs that they provide. However, in order to acquire a complete picture, we must analyze the preeminence of dissemination in communication, which is all – important precisely because of its power to provide an inventor with the capacity to perform with sufficient probability of success functions that are usually bound to fail.

52. My father used to say that passing on what has been created is just as important as the creation itself. This is a necessary concept, considering that the effective, focused and persistent dissemination of a technological innovation may make the difference between the success and failure of its application. The Internet has established itself as a suitable means of doing this. The global scenario that the Internet represents allows it to provide unrivalled possibilities for constant dissemination.

53. A great variety of more focused websites relating to inventors and inventiveness appear daily. The number of inventors’ associations, innovation promoters, hunters for projects and talent, service providers, consultants in very different fields and organizations within herent links to intellectual property is growing day by day, paralleled by the worldwide cybernetic development of invention. The bounds to which the Internet may extend, and the range and diversity of the services that can be published on it, are determined solely by ingenuity, boldness and creativity.

54. In Mexico, for example, we have successfully tested the provision of technological solutions conceived and created by inventors to specific industrial problems. An assessment has already been made of problems and the application of particular solutions in certain companies that have requested this service from the website on which we are promoting it (<http://www.madeja.com.mx/invento.htm>).

55. The essential promotion required by finished products and services can be made more professional and improved through the Internet, based on an appropriate strategy of penetration, advertising and relevance, and by connecting it to the largest possible number of traditional search engines and featuring it on various interrelated websites.

56. However, the existence of disputes with other figures from the world of intellectual property cannot be ignored, in particular with the appearance of more and more dishonest practices in cyberspace. The appearance of villains on the information superhighway, known as "hackers," has occurred very quickly. Regrettably, this has given rise to vandalism, industrial espionage and plagiarism, and has generated undesirable uses of the system.

57. This gives rise to the following among other things; the rapid spread of viruses that occur for no particular reason; the misuse of domain names to confuse users; the use of hidden texts or meta tags, words or signs incorporated in the source code that are either visible or audible but are processed by computers and read by those making searches; the use of unauthorized hyperlinks: the owner of a site may intend to have the highest possible level of confidentiality in providing products or services that users can access through his pages, but other sites can still connect up to those pages using hyperlinks. These are only some of the unfair practices that have been detected.

58. Another kind of concern arises with regard to the relationship between patent law and electronic commerce, or more accurately the use of digital networks such as the Internet. One of the two relevant aspects of the connection between the Internet and patents is that which refers to the analysis of the state-of-the-art in order to determine whether an invention is novel and involves an inventive step, as well as subjects relating to prior disclosure. Equally, aspects relating to industrial secrets may be involved; the possibility of access to, and appropriation and revelation of such secrets through networks, to the detriment of their owners, gives cause for concern.

59. Taking into account the conditions prevailing on the Net, in which in many cases form an essential element of innovation, while in others it is a simple statement of the unknown reveals the solution within itself whereby disclosing "what no one had thought" would be sufficient to exhibit the features of the innovation and to give it away, the expedient approach for incorporating a new kind of consumer innovation in Internet electronic commerce is to seek professional advice and support in both marketing and computers, so that efforts made do not prove vain or counterproductive. Both disciplines form an integral part of "innovation."

CYBERNETICS AS PART OF INVENTION

Digital prototypes

60. The final chapter of inventive activity is summed up in the physical materialization of an object on the basis of what has previously been imagined, formulated and calculated. The process presupposes an endless chain of experimental attempts which usually test to the limit both the inventor's unshakable tenacity and the almost always scant savings set aside or resources available for its production.

61. Thomas Alva Edison managed to invent the incandescent light bulb by means of his discovery in relation to the glowing property of a carbon filament, and the constancy that it retains when confined in a strong vacuum. This discovery was not made by the traditional scientific method, however; on the contrary, it was the result of prolonged experimentation

using various materials subjected to multiple tests in order to arrive at the solution. In no way is the procedure unworthy of the final deduction, the most notable factor in relation to the subject which concerns us being precisely the time and effort which were necessary for its development. If at that time Edison had been able to use modern cybernetic tools such as prototyping and digitization, he would surely have achieved the solution in just a few hours.

62. Prototyping and digitization is a combination of techniques which provides ways of interacting with three-dimensional digital models in the same way as objects would be handled in the physical world. The purpose of the digital prototype is to reduce costs and shorten the time spent on bringing the product to market, to generate a higher level of creativity and to construct a physical prototype correctly at the first attempt. With the digital prototype, a design can be perfected before the object is physically constructed, and the inventory costs of both construction and sales activities are thereby kept to a minimum. A digital prototype provides solutions that may be applied to all phases in the life cycle of a manufactured product. Conditions such as digital models, virtual models, digital assembly, basic design simulation and virtual prototypes are all part of what we know as prototyping and digitization.

VIRTUAL MODELLING

63. The last aircraft developed on the basis of physical prototypes by the Boeing Corporation in the United States was the 747 Jumbo. The Boeing 757 and all its predecessors, including USAir Force variants and the equipment produced by McDonnell Douglas, have been designed and constructed using prototyping and digitization techniques.

64. When producing integral mechanical simulations in real time on a computer, the design teams may revise even very large models, using virtual reality interfaces, and will therefore be able to identify and resolve design and manufacturing problems more quickly, thereby optimizing their designs and reducing the number of physical prototypes constructed.

65. Using these tools in computer systems and complex user interfaces, a designer has the freedom and flexibility, as well as the precision and accuracy, required for a creative process. A designer may profile, draw and plan in two dimensions, at the same time having the possibility of rapidly producing a three-dimensional model with a high degree of realism so that a picture may be shown to decision-makers, engineers, groups of marketing analysts and soon. Similarly, with the support of common format archives and direct interfaces with the most advanced CAD systems, the design data can be converted into the basic engineering model, thus guaranteeing that the original design remains intact through the integrated process.

CONCLUSIONS

66. The concept of the global village, while accurate, is ambiguous. The global potential of modern communication is implicit in the sense that it renders time and distance virtually meaningless. However, communication and computer networks still do not reach more than half of the world's population, which means that there is still a world in the dark, which omnipresent media such as television cause us to forget from time to time. The peoples of the world seek to integrate themselves in the future but in fact may distance themselves even further, divided as they are between those who have and those who do not have access to cyberspace.

67. The future conceals many mysteries for mankind, the only thing that is certain is that it will be defined by him. Irrefutable signs all over the planet warn us that man's future is determined by the terms laid down by science and technology, and clearly Third World countries are facing their last possible opportunity to play the role of protagonists in this scenario. The determination of our present actions will decide whether the role that we play in the future will be that of the leaders or the led.
68. The participation of the Third World in the technology market continues to be primarily in relation to imports, with increasing dependence on the developed world, and the measures allowing this process to be reversed have not yet been taken. As a result, it is impossible to understand why poor countries continue to give precedence to the transfer of built-in technologies such as machinery or equipment, which inhibits technological development, over direct technology transfer, namely the patents or intellectual property titles that make technological development possible in any country.
69. History teaches us that today's current economic powers chose at an appropriate moment in time to establish the necessary technological self-sufficiency as a strategy to overcome their serious economic crises.
70. The stock-market collapse of 1929, which started the economic recession in the United States, made that country's corporate and government strategists decide to accelerate the growth of technology as an emerging tactic with which to overcome financial instability and at the same time as a strategy for future sustainable development.
71. At the end of the Second World War, Japan had suffered perhaps the worst defeat in its history. It therefore chose to capitalize on its stoicism and discipline by developing its own technology. In 1964 Japan acquired 24 times as much direct technology as it sold ten years later. In other words, it obtained patents that served to create its own technological culture. Japan is now the world leader in such competitive industries as electronics, photography and watchmaking.
72. In contrast, the technology lag of the Third World in the 1970s was estimated to be eight years. According to World Bank data, that figure has since doubled. In terms of technology, a 15-year delay is equivalent to a century and a half.
73. Industrialized countries monopolize the predominance of innovation, while the Third World appears to have given up without the slightest concern. This is a false situation which will end up being reversed and causing harm to all concerned. Countries that do not "innovate" necessarily generate poverty, a condition that blurs progress. Where advances are not made, consumption is also halted. The figures that international organizations stress around in relation to poverty are categorical; the lessons to be learned are reiterative and suddenly become contradictory. The effects of the advance of poverty in the world are relentless, and its future is just as inescapable as it is uncertain.
74. We cannot remain insensitive to these disturbing warnings; the future will undoubtedly be linked to the achievement of world balance in innovation initiative. Integration in terms of innovation must be achieved on the basis of universal benefit and responsible cooperation. A distinction should be made between pending action still awaiting a decision and all-encompassing initiatives; new international alliance agreements need to be concluded; the developed world should be persuaded of the harmful repercussions that technological dependency entails, just as poor countries must be warned of the overriding need to generate a

culture of "innovation." Modern communication mechanisms combine favorable contexts and appropriate means.

75. Consolidating this action implies the involvement of wills and talents from the widest variety of spheres. The most important task must be to create awareness of the scope of technological innovation with a view to global integration of diversities. It is necessary to call on society as a whole which, at this moment in time, is faced with the grave responsibility of building a world for the new millennium.

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