Chapter 1

The Network Society: From Knowledge to Policy

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Understanding Social Transformation

Our world has been in a process of structural transformation for over two decades. This process is multidimensional, but it is associated with the emergence of a new technological paradigm, based in information and communication technologies, that took shape in the 1970s and diffused unevenly around the world. We know that technology does not determine society: it *is* society. Society shapes technology according to the needs, values, and interests of people who use the technology. Furthermore, information and communication technologies are particularly sensitive to the effects of social uses on technology itself. The history of the Internet provides ample evidence that the users, particularly the first thousands of users, were, to a large extent, the producers of the technology.

However, technology is a a necessary, albeit not sufficient condition for the emergence of a new form of social organization based on networking, that is on the diffusion of networking in all realms of activity on the basis of digital communication networks. This process can be likened to the role of electricity and the electrical engine in diffusing the organizational forms of the industrial society (eg. the large manufacturing factory, and its correlate the labor movement) on the basis of new technologies of energy generation and distribution. It can be argued that nowadays wealth, power, and knowledge generation are largely dependent on the ability to organize society to reap the benefits of the new technological system, rooted in microelectronics, computing, and digital communication, with its growing connection to the biological revolution and its derivative, genetic engineering. I have conceptualized as the network society the social structure resulting from the interaction between the new technological paradigm and social organization at large.

Often, the emerging society has been characterized as information society or knowledge society. I take exception with this terminology—not because knowledge and information are not central in our society, but because they have always been so, in all historically known societies. What is new is the microelectronics-based, networking technologies that provide new capabilities to an old form of social organization: networks. Networks throughout history had a major advantage and a major problem vis-a-vis other forms of social organization. On the one hand, they are the most adaptable and flexible organizational forms, so following very efficienctly the evolutionary path of human social arrangements. On the other hand, in the past they could not master and coordinate the resources needed to accomplish a given task or fulfill a project beyond a certain size and complexity of the organization required to perform the task. Thus, in the historical record, networks were the domain of the private life, while the world of production, power, and war was occupied by large, vertical organizations, such as states, churches, armies, and corporations that could marshall vast pools of resources around the purpose defined by a central authority. Digital networking technologies enable networks to overcome their historical limits. They can, at the same time, be flexible and adaptive thanks to their capacity to decentralize performance along a network of autonomous components, while still being able to coordinate all this decentralized activity on a shared purpose of decision making. Digital communication networks are the backbone of the network society, as power networks (meaning energy networks) were the infrastructure on which the industrial society was built, as it was demonstrated by historian Thomas Hughes. To be sure, the network society manifests itself in many different forms, according to the culture, institutions, and historical trajectory of each society, as the industrial society encompassed realities as different as the United States, and the Soviet Union, England or Japan, while still sharing some fundamental features that were recognized as defining industrialism as a distinct form of human organization—not determined by the industrial technologies, but unthinkable without these technologies.

Furthermore, because the network society is based on networks, and communication networks transcend boundaries, the network society is global, it is based on global networks. So, it is pervasive throughout the planet, its logic transforms extends to every country in the planet, as it is diffused by the power embedded in global networks of capital, goods,

services, labor, communication, information, science, and technology. So, what we call globalization is another way to refer to the network society, although more descriptive and less analytical than what the concept of network society implies. Yet, because networks are selective according to their specific programs, because they can simultaneously communicate and incommunicate, the network society diffuses in the entire world, but does not include all people. In fact, in this early 21st century, it excludes most of humankind, although all of humankind is affected by its logic, and by the power relationships that interact in the global networks of social organization.

Understanding structural transformation in its morphological form, meaning the rise of the network society as a specific type of social structure, frees the analysis from its promethean underpinnings, and leaves open the value judgment on the meaning of the network society for the well being of humankind. We are mentally framed in an evolutionary view of human progress, coming from the Enlightenment and reinforced by Marxism, according to which humankind, led by Reason and equipped with Technology, moves from survival to agricultural societies, then to the industrial society, and finally to the post-industrial/information/knowledge society, the shining hill where Homo Sapiens will finally make his dignified dwelling. Yet, even a superficial look at the historical record belies this fairy tale of human progress, as the Nazi or Stalinist Holocausts are witness to the destructive potential of the industrial age, and as the wonders of the information technology revolution coexist with the self-destructive processes of global warming or the resurgence of pandemics on a planetary scale.

So, the issue is not how to reach the network society as a self-proclaimed superior stage of human development. The issue is to recognize the contours of our new historical terrain, meaning the world we live in. Only then it will be possible to identify the means by which specific societies in specific contexts can pursue their goals and realize their values by using the new opportunities generated by the most extraordinary technological revolution in humankind, the one transforming our capacities of communication and enabling to modify the codes of life, that is the one giving us the tools to actually master our own condition, with all the potentially destructive or creative implications of this capacity. This is why diffusing the Internet or putting more computers in the schools does not in itself amount to much

social change. It depends where, by whom, for whom, and for what communication and information technologies are used. What we know is that this technological paradigm has superior performing capacity vis-a-vis previous technological systems. But to know how to use it to the best of its potential, and in accordance with the projects and decisions of each society, we need to know the dynamics, constraints and possibilities of the new social structure associated with it: the network society.

As for the actual content of the network society as a social structure, I will now turn to present what academic research knows on the subject.

The Network Society Beyond Myths: Findings of Scholarly Research (*)

In the early years of the 21st century, the network society is not the emerging social structure of the Information Age: it already configures the nucleus of our societies. Indeed, we have a considerable body of knowledge gathered in the last decade by academic researchers around the world on the fundamental dimesions of the network society, including studies that show the commonality of this nucleus across cultures, as well as the cultural and institutional differences of the network society in various contexts.

It is unfortunate that the media, politicians, social actors, business leaders, and decision makers continue to talk about the information society or the network society or whatever they want to call it, in terms that are those of futurology and uninformed journalism, as if the transformations were still in the future, and as if technology was an independent force that has either to be denounced or worshipped. Traditional intellectuals, increasingly unable to understand the world we live in, and thus undermined in their public role, are particularly critical of the advent of a new technological environment without actually knowing much about the processes on which they elaborate their discourses. In these views, new technologies destroy jobs, Internet isolates , we suffer from an overload of information, the digital divide increases social exclusion, Big Brother extends its surveillance thanks to more powerful digital technologies, technological development is controlled by the military, the tempo of our lives is

relentlessly accelerated by technology, biotechnology leads to human cloning and to major environmental hazars, Third World countries do not need technology but the satisfaction of their human needs, children are increasinly ignorant because they are messaging and chatting instead of reading books, nobody knows who is whom in the Internet, work efficiency is hampered by technology that does not rely on human experience, crime and violence, and even terrorism use the Internet as a privileged medium, and we are rapidly losing the magic of the human touch. We are alienated by technology. Or else, you can reverse everything I just wrote in the opposite sense, and we will enter the paradise of human fulfillment and creativity induced by technological wonders, in the mirror version of the same mythology, this time propagated by consultants and futurologists, often on the payroll of technology companies.

And yet we know reasonably well the contours of the network society. There is in fact a big gap between knowledge and public consciousness, mediated by the communication system and the processing of information within our mental frames.

The network society, in the simplest terms, is a social structure based on networks operated by information and communication technologies based in microelectronics and digital computer networks that generate, process, and distribute information on the basis of the knowledge accumulated in the nodes of the networks. A network is a formal structure (see Monge and Contractor, 2004). It is a system of interconnected nodes. Nodes are, formally speaking, the points where the curve intersects itself. Networks are open structures that evolve by adding or removing nodes according to the changing requirements of the programs that assign performance goals to the networks. Naturally, these programs are decided socially from outside the network. But once they are inscripted in the logic of the network, the network will follow efficiently these instructions, adding, deleting, and reconfigurating, until a new program replaces or modifies the codes that command its operational system.

What the network society actually is cannot be decided outside the empirical observation of social organization and practices that embody this network logic. Thus, I will summarize the essence of what scholarly research (that is the production of knowledge recognized as such by the scientific community) has found in various social contexts.

Let us start with the economy. **The network economy** (known at one point as "the new economy") is a new, efficient form of organization of production, distribution, and management that is at the source of the substantial increase in the rate of productivity growth in the United States, and in other economies that adopted these new forms of economic organization. The rate of productivity growth in the U.S. during 1996-2005 more than doubled the rate of productivity growth in 1975-95. Similar observations can be applied to those European economies, such as Finland or Ireland, that quickly adopted a similar form of techno-economic organization, albeit in a very different institutional context (eg, the maintenance of the welfare state). Studies, including the research presented by Dale Jorgenson in this volume, show that the rate of productivity growth in other European economies and in Japan may have increased as well once statistical categories are adapted to the conditions of production in an economy that has gone beyond the industrial era under which these categories were created. Throughout the world, developing economies that articulate themselves to the dynamic nucleus of the global network economy display even higher rates of productivity growth (eg in the manufacturing sectors of China or India). Moreover, the increase of productivity is the most direct empirical indicator of the transformation of a productive structure. Researchers have found that productivity growth in this period has been largely associated to three processes, all of which are necessary conditions for productivity growth to take place: generation and diffusion of new microlectronics/digital technologies of information and communication, on the basis of scientific research and technological innovation; transformation of labor, with the growth of highly educated, autonomous labor that is able to innovate and adapt to a constantly changing global and local economy; diffusion of a new form of organization around networking. Only when the three conditions are fulfilled in a firm, a sector, a region, or a country, productivity rises substantially, and only this surge in productivity can sustain competitiveness in the long run.

Organizational networking is as critical today as was the process of vertical integration of production in the large scale organizations of the industrial era. Networking has proceeds through a number of processes that reinforced each other over the last 25 years: large corporations decentralize themselves as networks of semi-autonomous units; small and medium firms form business networks, keeping their

autonomy and flexibility while making possible to pull together resources to attain a critical mass, enabling them to compete in the market; small and medium business networks become providers and subcontractors to a variety of large corporations; large corporations, and their ancillary networks, engage in strategic parnertships on various projects concerning products, processes, markets, functions, resources, each one of this project being specific, and thus building a specific network around such a project, so that at the end of the project, the network disolves and its components form other networks around other projects. Thus, at any given point in time, economic activity is peformed by networks of networks built around specific business projects. The firm continues to be the legal unit, and the unit for accumulation of capital, but the operational unit is the business network, what I call the network enterprise to emphasize the fact that is a network focusing on performing a project. Besides, since accumulation of capital actually takes place in the global financial market, that is also a network, the firm is simply the connecting node between the networks of production built around business projects and the networks of accumulation organized around global finance.

These networks are those that hire and fire workers on a global scale. It follows structural unstability in the labor markets everywhere, and a requirement for flexibility of employment, mobility of labor, and constant re-skilling of the workforce. The notion of a stable, predictable, professional career is eroded, as relationships between capital and labor are individualized and contractual labor conditions escape collective bargaining.

Together with the feminization of the labor force, we can say, summarizing numerous studies, that **we have evolved from "the organization man" to the "flexible woman."** However, this process of individualization and fragmentation of the labor force does not mean that long term contracts and stable jobs disappear. There is flexibility built into stability. And there are considerable differences for various categories of workers and levels of skill. **The key developments in the transformation of labor and work are:**

> Technological change does not induce unemployment in the aggregate labor market. Although some workers are displaced and some occupations are phased out (eg, traditional typist-secretaries), other occupations appear (eg. assistant managers

instead of secretaries), more jobs are created, and most displaced workers are re-employed, except for those too old to adapt, their fate being decided depending on public policies in each society. In fact, the least technologically advanced is a firm, region or country, and the more it is exposed to layoffs of its workers, since it cannot keep up with the competition. So, there is a correlation between technological innovation and employment, as well as between technological innovation, organizational innovation, and standards of living of workers.

Ability to work autonomously and be an active component of a network becomes paramount in the new economy. This is what I have conceptualized as **self-programmable labor.** Companies will seek to retain this type of labor as much as possible, because this is the main source for its productivity and innovation capacity. This runs against the notion of the unstability of the labor force. However, the self-programmable worker is the one that has bargaining power in the labor market. So, his/her contract may be a stable one, but his/her continuity in the job tends to be reduced vis-a-vis previous cohorts of workers, because he/she is always on the move, searching for new opportunities. And not necessarily to increase monetary gains but to enjoy greater freedom, flex-time, or more opportunity to create.

Most workers are still not employed at the best of their capacity, but as mere executants along the lines of traditional industrial discipline. In this case, they are generic labor, and they can be replaced by machines or by less expensive labor either in the country (immigrants, women, minorities) or across the globe. Under such conditions, companies tend to limit long term commitment to generic labor, thus opting for subcontracting, temporary employment, or part time work. On the other hand, these workers tend to strengthen their negotiation power through collective bargaining and unionization. But being the most vulnerable labor force, they increasingly face an uphill battle that is at the source of offshoring of manufacturing and routine service work.

There is a growing contradiction between the autonomy and innovation capacity required to work in the network enterprise, and the system of management/labor relations rooted in the institutions of the industrial age. The ability to reform this sys-

tem conditions the organizational and social transition in all societies. More often than not, the necessary adaptation of the workforce to the new conditions of innovation and productivity is manipulated by companies to their advantage. It is a self-defeating strategy for management, as workers can only use their autonomy to be more productive if they have a vested interest in the competitiveness of the firm. This interest starts with their stability in their jobs, and their ability to make their own decisions in the operation of the network.

Trade unions do not disappear in the network society. But, depending on their strategies, they might become trenches of resistance to economic and technological change, or powerful actors of innovation on the new meaning of work and wealth creation in a production system based on flexibility, autonomy, and creativity. Organizing labor in a network of networks has very different requirements to organizing labor in the socialized process of work in the large corporation. While changes in the labor force and in the labor market are structural, linked to the evolution of the network society, changes in the role of social actors depend on their practice, and on their ability to situate the interests they defend in the new forms of production and management.

The network society is also manifested in **the transformation of sociability.** Yet, what we observe is not the fading away of face-to-face interaction or the increasing isolation of people in front of their computers. We know, from studies in different societies, that in most instances Internet users are more social, have more friends and contacts, and are more socially and politically active than non users. Moreover, the more they use the Internet, the more they also engage in face-to-face interaction in all domains of their lives. Similarly, new forms of wireless communication, from mobile phone voice communication to SMSs, WiFi and WiMax, substantially increase sociability, particularly for the younger groups of the population. The network society is a hypersocial society, not a society of isolation. People, by and large, do not fake their identity in the Internet, except for some teenagers experimenting with their lives. People fold the technology into their lives, link up virtual reality and real virtuality, they live in various technological forms of communication, articulating them as they need it.

However, there is a major change in sociability, not a consequence of Internet or new communication technologies, but a change that is fully supported by the logic embedded in the communication networks. This is the emergence of **networked individualism,** as social structure and historical evolution induce the emergence of individualism as the dominant culture of our societies, and the new communication technologies perfectly fit into the mode of building sociability along self-selected communication networks, on or off depending on the needs and moods of each individual. So, the network society is a society of networked individuals.

A central feature of the network society is **the transformation of the realm of communication, including the media.** Communication constitutes the public space, i.e. the cognitive space where people's minds receive information and form their views by processing signals from society at large. In other words, while interpersonal communication is a private relationship, shaped by the actors of the interaction, media communication systems sets the relationship between the institutions and organizations of society and people at large, not as individuals, but as a collective receiver of information, even if ultimately information is processed by each individual according to her personal characteristics. This is why the structure and dynamics of socialized communication is essential in the formation of consciousness and opinion, at the source of political decision making.

In this regard, **the new communication system is defined by three major trends:**

Communication is largely organized around media business conglomerates that are global and local at the same time, and that include television, radio, the print press, audiovisual production, book publishing, music recording and distribution, and on line commercial firms. These conglomerates are linked to media organizations around the world, under different forms of partnership, while engaging at the same time in fierce competition amongst themselves. Communication is both global and local, generic and customized, depending on markets and products.

The communication system is increasingly digitized, and gradually interactive. So, concentration of business does not mean a unified, unidirectional process of communication. Societies have moved from a mass media system to a customized and fragmented multimedia system, where audiences are increasingly segmented. Because the system is diversified and flexible, it is increasingly inclusive of every message sent in society. In other words, the technological malleability of the new media allows a much greater integration of all sources of communication into the same hypertext. So, digital communication becomes less centrally organized, but absorbs into its logic an increasing share of social communication.

As the network society diffuses, and new communication technologies expand their networks, there is an explosion of horizontal networks of communication, quite independent from media business and governments, that allows the emergence of what I call **self-directed mass communication.** It is mass communication because it is diffused throughout the Internet, so it potentially reaches the whole planet. It is self-directed because it is often initiated by individuals or groups by themselves, bypassing the media system. The explosion of blogs, vlogs, podding, streaming, and other forms of interactive, computer to computer communication sets up a new system of global, horizontal communication networks that, for the first time in history, allow people to communicate with each other without going through the channels set up by the institutions of society for socialized communication.

Thus, the network society constitutes socialized communication beyond the mass media system that characterized the industrial society. But it does not represent the world of freedom sung by the libertarian ideology of Internet prophets. It is made up both of an oligopolistic business multimedia system controlling an increasingly inclusive hypertext, and of an explosion of horizontal networks of autonomous local/global communication—and, naturally, of the interaction between the two systems in a complex pattern of connections and desconnections in different contexts. However, what results from this evolution is that the culture of the network society is largely shaped by the messages exchanged in the composite electronic hyper-

text made by the technologically linked networks of different communication modes. In the network society, virtuality is the foundation of reality through the new forms of socialized communication.

Since **politics is largely dependent on the public space of socialized communication, the political process is transformed under the conditions of the culture of real virtuality.** Political opinions, and political behavior, are formed in the space of communication. Not that whatever is said in this space determines what people think or do. In fact, the theory of the interactive audience, supported by research across cultures, has determined that receivers of messages process these messages in their own terns. Thus, we are not in an Orwellian universe, but in a world of diversified messages, recombining themselves in the electronic hypertext, and processed by minds with increasinly autonomous sources of information. However, the domination of the media space over people's minds works through a fundamental mechanism: presence/absence of a message in the media space. Everything or everyone that is absent from this space cannot reach the public mind, thus it becomes a non entity. This binary mode of media politics has extraordinary consequences on the political process and on the institutions of society. It also implies that presence in the media is essential for building political hegemony or counter-hegemony—and not only during the electoral campaigns.

Mainstream media, and particularly television, still dominate the media space, although this is changing fast. Because the language of television is based on images, and the simplest political image is a person, political competition is built around political leaders. Few people know the actual programs of political parties. And programs are built by pollsters focusing on what people would like, so they tend to be very similar at least in their wording. People think in metaphors, and built these metaphors with images. Trust and character are constructed around the image of a person. Because of this, character assassination becomes the political weapon of choice. Negative messages are much more effective than positive messages. And the most negative message is to undermine the trust of people in their potential leader by diffusing, fabricating, or manipulating damaging information. Media politics and image politics lead to scandal politics, the kind of politics at the forefront of the political processe almost everywhere in the world.

There is an even deeper transformation of political institutions in the network society: **the rise of a new form of state** that gradually replaces the nation-states of the industrial era. This is related to globalization, that is the formation of a network of global networks than link selectively across the planet all functional dimensions of societies. Because the network society is global, the state of the network society cannot operate only or primarily in the national context. It has to engage in a process of global governance but without a global government. The reasons why there is not a global government, and it is unlikely it will be one in the foreseable future, are rooted in the historical inertia of institutions, and of the social interests and values embedded in these institutions. Simply put, neither current political actors nor people at large want a world government, so it will not happen. But since global governance of some sort is a functional need, nation-states are finding ways to co-manage the global processes that affect most of the issues related to their governing practice. To do so, they increasingly share sovereignty while still proudly branding their flags. They form networks of nation-states, the most integrated and significant of which is the European Union. But they are around the world a number of state associations more or less integrated in their institutions and their practice that structure specific processed of transnational governance. In addition, nation-states have spurred a number of formal and informal international and supranational institutions that actually govern the world. Not only the United Nations, and verious military alliances, but also the International Monetary Fund and its ancillary agency, the World Bank, the G-8 club of leading countries in the world (with the permission of China), and a number of ad hoc groupings.

Furthermore, to connect the global and the local, nation-states have asserted or fostered a process of decentralization that reaches out to regional and local governments, and even to NGOs, often associated to political management. Thus, the actual system of governance in our world is not centered around the nation-state, although nation-states are not disappearing by any means. Governance is operated in a network of political institutions that shares sovereignty in various degrees an reconfigurates itself in a variable geopolitical geometry. This is what I have conceptualized as **the network state.** It is not the result of technological change, but the response to the structural contradiction between a global system and a national state. However,

globalization is the form that takes the diffusion of the network society in its planetary reach, and new communication and transportation technologies provide the necessary infrastructure for the process of globalization. New communication technologies also help the actual operation of a complex network state, but this is a tool of performance rather than a determining factor. The transition from the nation-state to the network state is an organizational and political process prompted by the transformation of political management, representation and domination in the conditions of the network society.

Thus, the network society is not the future that we must reach as the next stage of human progress by embracing the new technological paradigm. It is our society, in different degrees, and under different forms depending on countries and cultures. Any policy, any strategy, any human project, has to start from this basic fact. It is not our destination, but our point of departure to wherever "we" want to go, be it heaven, hell, or just a refurbished home.

Key Policy Issues in the Network Society

People, social actors, companies, policy makers do not have to do anything to reach or develop the network society. **We are in the network society,** although not everything or everybody is included in its networks. Therefore, from a policy standpoint, the key question is how to proceed to maximize the chances for fulfilling the collective and individual projects that express social needs and values under the new structural conditions. For instance, a full deployment of broad band digital communication networks, wired or wireless, is certainly a conditioning factor for business to work on the model of the network enterprises or for virtual education to foster life long learning, a major asset in the knowledge-based social organization characteristic of the society. However, to introduce technology per se does not ensure productivity, innovation, or greater human development. Thus, when in 2000 the European Union approved a strategy known as the Lisbon Agenda to catch up with the United States in economic competitiveness, while strengthening the European social model, much of the emphasis was placed on technological upgrading and enhancement of research capabilities. The European technological infrastructure improved considerably, but effects on productivity, on learning, on creativity, and on entrepreneurialism, were very limited. This is

because acting on the developmental potential specific to the network society requires a combination of initiatives in technology, business, education, culture, spatial restructuring, infraestructure development, organizational change, and institutional reform. It is the synergy between these processes that acts as a lever of change on the mechanisms of the network society.

With this perspective in mind, and observing both the European and international experience in the first years of the 21st century, there are some issues that appear to be conditioning the overall development of a productive, creative, and equitable network society. In other words, policies tackling these strategic issues seem to be the key policies to deliberately advance human well being in the new historical context. Being highly selective and certainly subjective, since we have now left the presentation of research findings to enter the policy debate, here then are what I consider to be the key issues:

- **The public sector is at present the decisive actor to develop and shape the network society.** Individual innovators, counter-cultural communities, and business firms have done their job at inventing a new society and diffusing it around the world. The shaping and guiding of this society is, as has always been the case in other societies, in the hands of the public sector, regardless of ideological discourses hiding this reality. And yet, the public sector is the sphere of society where new communication technologies are the least diffused and where organizational obstacles to innovation and networking are the most pronounced. Thus, **reform of the public sector commands everything else** in the process of productive shaping of the network society. This includes the diffusion of e-governance (a broader concept than e-government because it includes citizen participation and political decision-making); e-health; e-learning; e-security; and a system of dynamic regulation of the communication industry, adapting it to the values and needs of society. All these transformations require the diffusion of interactive, multilayered networking as the organizational form of the public sector. This is tantamount to the reform of the state. Indeed, the rational bureaucratic model of the state of the industrial era is in complete contradiction to the demands and processes of the network society.

- At the source of the entire process of social change there is a new kind of worker, the self-programmable worker, and a new type of personality, the values-rooted, flexible personality able to adapt to changing cultural models along the life cycle because of her/his ability to bend without breaking, to remain inner-directed while evolving with the surrounding society. This innovative production of human beings, under the conditions of the crisis of patriarchalism and the crisis of the traditional family, **requires a total overhauling of the school system,** in all its levels and domains. This refers certainly to new forms of technology and pedagogy, but also to the content and organization of the learning process. As difficult as it sounds, societies that will not be able to deal with this issue will encounter major economic and social problems in the current process of structural change. For instance, one of the major reasons for the success of the Finnish Model in the network society resides in the quality of its education system, in contrast to other areas in the world, for instance the United States, where much of the population is increasingly alien to the system of knowledge management that has been largely generated in their own country. Education policy is central to everything. But not any kind of education or any kind of policy: education based on the model of learning to learn along the life cycle, and geared towards stimulating creativity and innovation in the ways and goals of applying this learning capacity in all domains of professional and social life.

- Global development is now largely a function of enabling countries and their people to function productively in the global economy and the network society. This implies the diffusion of information and communication technologies througout the world, so that networks reach everywhere. But it also implies the production of the human resources necessary to operate this system, and the distribution of capacity to generate knowledge and manage information. **The new, informational model of development redefines the condition of shared growth in the world.** In fact, hundreds of millions of people have benefited from the global competition spurred by the dynamism of these networks. Large sections of China, India, East and Southeast Asia, the Middle East, and

some Latin American areas (Chile certainly, but also some regions of other countries) are now integrated productively in the networked global economy. Yet, more people are switched off from these networks than fully incorporated to them. The global segmentation of the network society, precisely because of its dynamism and productivity, is placing a significant part of humankind under conditions of structural irrelevance. It is not just poverty, it is that the global economy and the network society work more efficiently without hundreds of millions of our co-inhabitants of this planet. Thus, a major contradiction: the more we develop a highly productive, innovative system of production and social organization, the less this core needs a substantial proportion of marginal population, and the more difficult it becomes for this population to catch up. The correction of this massive exclusionary process requires concerted international public policy acting on the roots of the new model of development (technology, infrastructure, education, diffusion and management of knowledge) rather than just providing for the needs arising from social exclusion in the form of charity.

- Creativity and innovation are the key drivers of value creation and social change in our societies—in fact in all societies. **In a world of digital networks, the process of interactive creativity is contradicted by the legislation of property rights inherited from the industrial era.** Moreover, because large corporations have built their wealth and power on the control of these property rights, regardless of the new conditions of innovation, companies and governments are making the communication of innovation even more difficult than in the past. The capture of innovation by an intellectually conservative business world may well stall the new waves of innovation on which the creative economy and a redistributive network society depend. Even more so at the global level, as intellectual property rights become the key issue for latecomers in the global competition. International agreements on the redefinition of intellectual property rights, starting with the well rooted practice of open source software, is a must for the preservation on innovation and the fostering of creativity on which depends human progress now and then.

Dilemmas of Our Time: Creativity versus Rentier Capitalism; Communication Democracy versus Political Control

In this early 21st century we are at the crossroads of the development of the network society. We are witnessing an increasing contradiction between current social relationships of production and the potential expansion of formidable productive forces. This may be the only lasting contribution from the classical Marxist theory. The human potential embedded in new communication and genetic technologies, in networking, in the new forms of social organization and cultural invention, is truly extraordinary. Yet, existing social systems stall the dynamics of creativity, and, if challenged with competition, tend to implode. This was the case of the statist system of the Soviet Union (Castells and Kiselyova, 1995). Now, rentier capitalism of the Microsoft type appears to be blocking the development of a new frontier of expansion of innovation, in contrast to other capitalist business models, eg. the newborn IBM. Thus, reform of capitalism is also possible in this domain, including new models of intellectual property rights, and a diffusion of technological development responsive to the human needs of the whole planet. This is why the issue of intellectual property rights is strategically so important.

But there is something else: the emergence of unfettered communication and self-organization at the socio-political level, bypassing the mass media, and challenging formal politics. This is the case of insurgent political campaigns, such as Howard Dean's campaign in the U.S. in 2003-04, or the exposure of Jose Maria Aznar's lies on terrorism by thousands of Spanish youth mobilized with their cell phones, and leading to the electoral defeat of Spanish conservatives in March 2004. This is why in fact governments are ambiguous vis-a-vis the uses of Internet and new technologies. They praise their benefits, yet they fear to lose the control of information and communication in which power has always been rooted.

Accepting democracy of communication is accepting direct democracy, something no state has accepted in history. Accepting a debate to redefine property rights goes to the heart of the legitimacy of capitalism. Accepting that the users are the producers of technology challenges the power of the expert. So, an innovative, yet pragmatic policy will have to find a middle way between what is socially and politically

feasible in each context, and the enhancement of the cultural and organizational conditions for creativity on which innovation, thus power, wealth, and culture, are based in the network society.

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(*) The analysis presented here is based on a very broad body of research that would overwhelm the thread of the argument if fully cited in this text. Therefore, I am taking the liberty to refer the reader to my recent works on the matter, not because I support my analysis with my own bibliography, but because my recent publications contain an extensive, and systematic bibliography from different areas in the world, that should be considered as the generic references of the analysis.

With this caveat, the interested reader may consult the sources included in the following books by Manuel Castells:

The Information Age: Economy, Society, and Culture, Oxford: Blackwell, 3 volumes, 2nd edition, 2000-2004; *The Internet Galaxy*, Oxford: Blackwell, 2001; *The collapse of Soviet Communism: the view from the Information Society*, Berkeley, International and Area Studies Press, 1995 (with Emma Kiselyova) (updated edition by Figueroa Press, Los Angeles, 2003); *La societat xarxa a Catalunya*, Barcelona: Random House, 2003 (with I.Tubella et alter); *The Information Society and the Welfare State: The Finnish Model*, Oxford: Oxford University Press, 2002 (with Pekka Himanen); *The Network Society: A Cross-Cultural Perspective*, Northampton, Massachussets: Edward Elgar, 2004 (editor and co-author); "Global Governance and Global Politics," *Political Science*, January 2005; *The Mobile Communication Society*, forthcoming (with M. Fernandez-Ardevol, JCL Qiu, and A. Sey). In addition, important references on specific points are the recent books by Peter Monge and Nosh Contractor, *A Theory of Communication Networks*, New York: Routledge, 2004; Frank Levy, *Computers and Work*, Cambridge, MA: MIT Press, 2005; and Ulrich Beck, *Power in the Global Age*, Cambridge: Polity Press, 2006.

Furthermore, the chapters in this book, and their references, have also been used in the elaboration of my analysis.