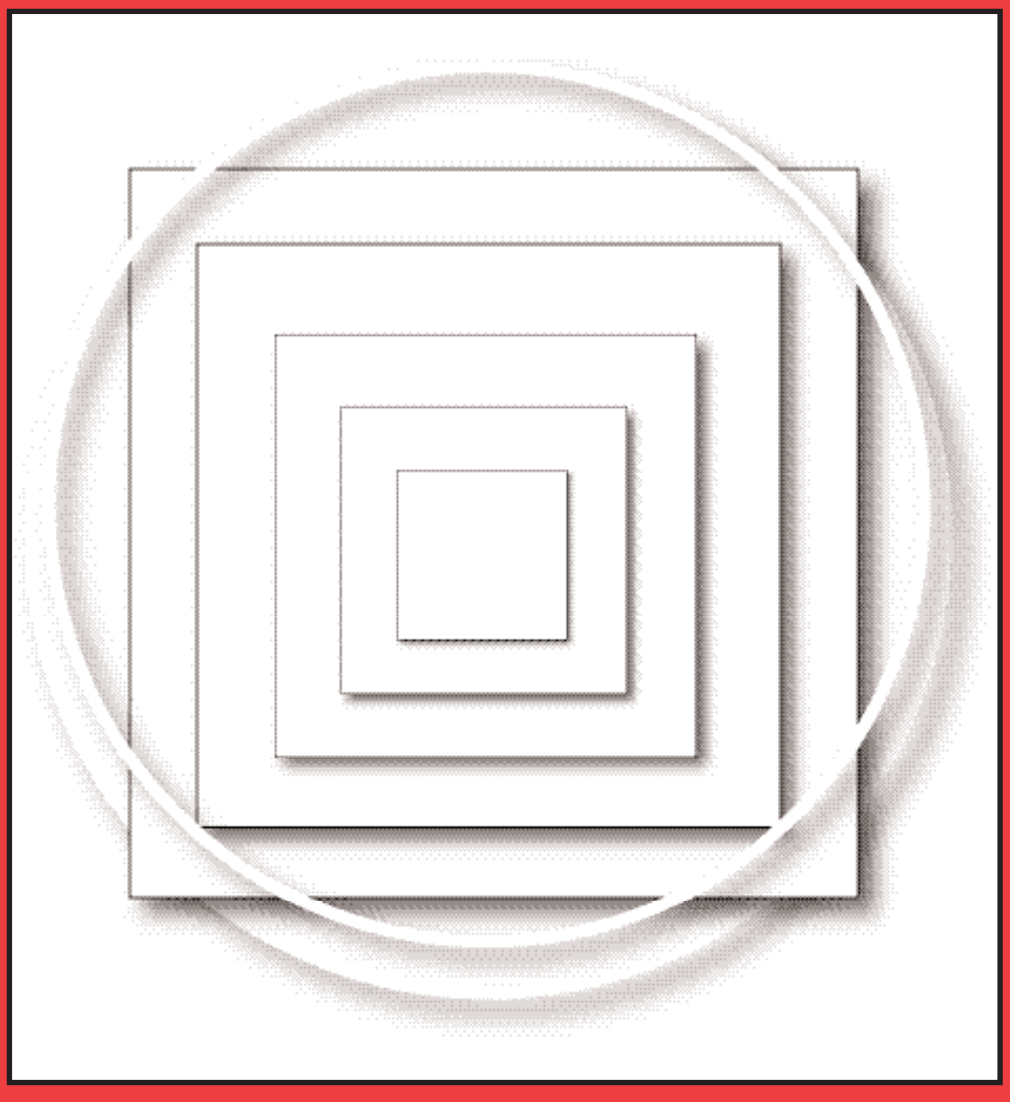
Economic & Social Affairs

Understanding Knowledge Societies

In twenty questions and answers with the Index of Knowledge Societies



United Nations

ST/ESA/PAD/SER.E/66

Department of Economic and Social Affairs
Division for Public Administration and
Development Management

Understanding Knowledge Societies

In twenty questions and answers with the Index of Knowledge Societies

United Nations
New York, 2005

DESA

The Department of Economic and Social Affairs of the United Nations Secretariat is a vital interface between global policies in the economic, social and environmental spheres and national action. The Department works in three main interlinked areas: (i) it compiles, generates and analyses a wide range of economic, social and environmental data and information on which States Members of the United Nations draw to review common problems and to take stock of policy options; (ii) it facilitates the negotiations of Member States in many intergovernmental bodies on joint courses of action to address ongoing or emerging global challenges; and (iii) it advises interested Governments on the ways and means of translating policy frameworks developed in United Nations conferences and summits into programmes at the country level and, through technical assistance, helps build national capacities.

Note

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The designations “developed” and “developing” economies are intended for statistical convenience and do not necessarily imply a judgement about the stage reached by a particular country or area in the development process.

ST/ESA/PAD/SER.E/66
ISBN 92-1-109145-4

United Nations publication
Sales No. E.04.II.C.1

Printed by the United Nations
Publishing Section
New York

Foreword

This volume has grown out of the 2003 World Public Sector Report, E-government at the Crossroads. Indeed, in some sense it can be treated as an overgrown appendix to that Report. Then, we tried to answer the question, "What makes e-government meaningful?" Now, the question is, "How can a society adjust to the challenge of mass-produced knowledge?" Then, it was about the tension between technology and organization. Now, it is about the tension between technology and society as a whole.

The former concern has been relatively easy to resolve. A government that faces modern ICT should become an e-government and serve as an instrument to increase the amount of public value produced by the government. By the same token, a business that faces modern ICT should become an e-business and serve as an instrument to increase the amount of value along the economic value chain. It is tempting to follow this road: e-library, e-learning, e-health care, e-participation, e-civil society, etc. But will converting every organization into an e-organization result in the transition of a society to a Knowledge Society (k-society)? That would be tantamount to assuming that at a certain level, the quantitative accumulation of "e-"s would switch into a "k-," a qualitative leap that, on reflection, is rather difficult to take.

Yet, we see many a government, international organization or expert in the world today de facto making such an assumption. This is troubling, as such an assumption – if incorrect – points the discussion about transition to the Knowledge Society in the wrong direction. What is worse, it may even prevent us from an early enough understanding of the profound character of the adjustment that societies will need to make in order to manage the encounter with modern technology (and especially ICT) for the benefit of all their members.

This study submits that the accumulation of "e-"s will never result in a "k-." Rather, it puts forth the idea that if societies desire to follow the path of knowledge-based growth and development, a very thorough reconstruction of their institutions must occur. It suggests to political leaders, public administrations and the public at large that a broad, well-informed debate about this institutional shift should be undertaken. The magnitude of such a shift would require the cooperation of all segments of society and their sharing not only of the risk and cost of change, but first and foremost, of common goals and values. It is hoped that this study will inform this debate or at least sketch its parameters.

Guido Bertucci
Director
Division for Public Administration and Development Management
United Nations Department of Economic and Social Affairs

New York, 14 March 2005

Acknowledgements

The Report has been finalized under the direction of Guido Bertucci, Director of the United Nations Department of Economic and Social Affairs (UNDESA) Division for Public Administration and Development Management.

Jerzy Szeremeta, main author of the Report, has led the research in the Division that has resulted in development of the key concepts and ideas on which the analysis it contains is based.

Irene Tinagli of the Carnegie Mellon University has cooperated in development of the Index of Knowledge Societies (IKS) and authored the relevant parts of the Report.

The whole research effort was greatly enhanced by results of the UN Ad Hoc Group of Experts Meeting on Knowledge Systems and Development (New York, September 2003) and discussion during the fourth meeting of the UN Committee of Experts on Public Administration (New York, April 2004).

Special words of thanks must also go to those who at various stages of the analysis, when key concepts and ideas were formulated, devoted their time and effort to reviewing and discussing them: Juliana de Assis Coutinho, Gareth Hughes, Jeremy Millard, Shalini Venturelli, Ernest J. Wilson III and Dieter Zinnbauer; as well as to Sone Davayan, who provided invaluable assistance with the literature review.

Contents

Boxes

Graphs

Tables

Executive Summary

By the turn of the century, humanity had learned how to mass-produce knowledge. This new skill had been invented and successfully tested in the environment of private business enterprise and market economy. However, it is generic in nature. It combines the capacities of modern ICT with information and group thinking organized in "shared spaces for knowledge creation"[1] (a.k.a. creative networks or *ba*).

The Report:

- recognizes the existence of tension between society on one hand and new technology (modern ICT) and techniques for (mass-) development of knowledge (via "shared spaces for knowledge creation") on the other.
- maintains that any society can successfully cope with this tension by setting up institutions and organizations that enable people and information to develop without limits, and that open opportunities for all kinds of knowledge to be mass-produced and mass-utilized throughout the society as a whole. The Report interprets a society that follows this path as a Knowledge Society.
- identifies the development of people as citizens and the development of democracy as effective conduits for achieving this transformation.
- suggests that at its best, the Knowledge Society involves all members of a community in knowledge creation and utilization; it supports the goal of high quality and safety of life for all people everywhere.

The Report attempts to establish how governments can lead and how societies can organize for this transformation. While the recipe seems complex, it is based on four key assumptions:

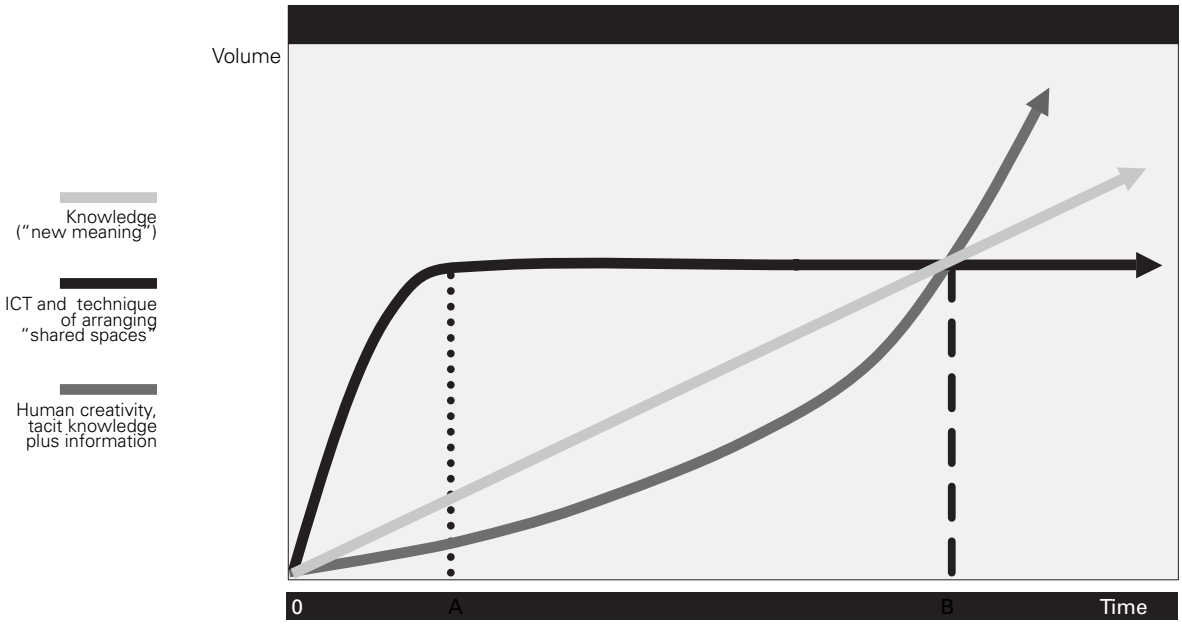
1. In the process of knowledge development, there are two main assets that can develop ad indefinitum: people (all people everywhere, even "the others" who, like poor people, hitherto have been treated as dangerous deviants) as creative beings and carriers of tacit knowledge[2] ; and, information (explicit knowledge[3]) that triggers people's creative reflection, leading to the appearance of "new meaning."[4]
2. The skill to mass-produce knowledge is being brought to fruition in a world that is organized predominantly into market democracies. The social institutions of the currently existing democracies and currently existing markets must allow (or be transformed to allow) limitless development and use in the process of knowledge development of people and information. This poses a challenge as the currently existing democracies feature minorities with narrow encompassing interests[5] that are allowed, by lack of genuine participation, to control public power and to channel in a disproportionate way, public resources and developmental opportunities in their own direction. This translates into limited developmental opportunities for many (or most) that happen to be on the other side of the power divide. And, the currently existing markets are addicted to an easy opportunity to split the total cost of the production of many goods and services into two parts. One part (the smaller, the better) is used to calculate the price at which the goods and services are offered on the market. The other one (as large as the producer can get away with) is usually referred to as "negative externalities."[6] The net negative externalities constitute the loss to society as a whole. They translate into limited development opportunities for people and gradually increasing stress on the biosphere. In the post-modern world, in which mass-produced knowledge "to do" offers investment opportunities in products with

high risk content, they add a concern about "human safety" and "safety of life" in general to the traditional development agenda that, till now, has been predominantly focused on achieving "high quality" of life.

3. To be a Smart Knowledge Society (as distinct from a Nominal or Warped Knowledge Society), it is not enough to be rich in main assets and to take care of their development. A new sense of direction in development and a commitment to this new direction must assure high levels of quality and safety of life. Mass production of the knowledge "to do," piling up technological innovations, and converting them into products and services in the framework of the Knowledge Economy managed by the currently existing market does not by itself assure high levels of quality and safety of life for all people everywhere. The new direction in development can be formulated on the basis of using the techniques and means to mass-produce knowledge to turn out and apply the knowledge "to be," to co-exist" and "to maintain developmental equilibrium."

4. And finally, deployment of modern ICT in the context of knowledge development allows the addition of the prefix "mass-" to the production, diffusion and utilization of knowledge. However, as illustrated below, in the future, ICT as a means for accelerating production of knowledge is a resource whose impact on this process will diminish and stabilize as a constant. People are the only factor for accelerating the development of knowledge that is not finite and will not become obsolete.

Mass production of knowledge: evolution of main factors over time



The Report also attempts to investigate how the world has been doing in the course of this budding transformation.

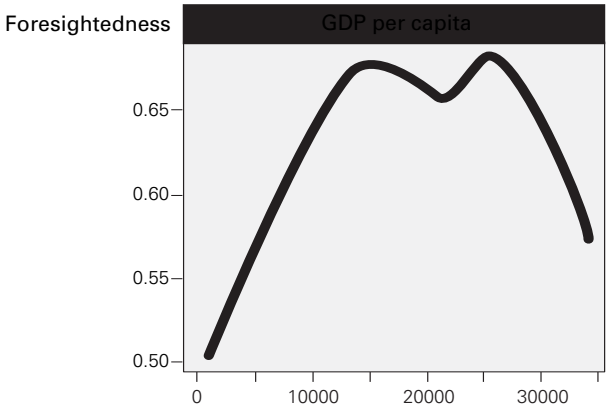
The result of this investigation is less than complete due to lack of adequate, comparable data. It is summarized in the Report's "illustrative" and "experimental" IKS (Index of Knowledge Societies). IKS is a composite index of the three measures: (1) assets; (2) development of assets, i.e. "advancement"; and, (3) "foresightedness" in following a developmental direction, i.e. commitment to high levels of quality and safety of life. It suggests the following:

- In the random sample of 45 countries for which enough data could be gathered, Sweden leads. The top 10 countries are ranked as follows:

	Country Name	IKS Index
1	Sweden	0.776
2	Denmark	0.763
3	Norway	0.719
4	Switzerland	0.706
5	Finland	0.704
6	Japan	0.696
7	Germany	0.696
8	Austria	0.692
9	New Zealand	0.692
10	United Kingdom	0.688

- The five countries at the very top of the IKS ranking are all relatively small countries with relatively small economies. This seems to suggest that while in an industrial economy an abundance of natural resources and the availability of a large (domestic) market have been two critical drivers of competitiveness – and that therefore a large country/economy has usually held an intrinsic advantage over smaller ones – such a paradigm might not necessarily hold true in the Knowledge Society.
- At the same time, being small does not give an automatic advantage, nor is such an advantage assured by wealth. In the key measure of "foresightedness" in development, both countries with high and low GDP per capita are scattered all over the "foresightedness map." What is more, non-parametric regression[7] of the Foresightedness Index results against the GDP per capita suggests that the relationship between GDP and "foresightedness" is non-linear, and when wealth is pushed beyond certain value levels, its harmonic relationship with "smart" growth and development tends to vanish; the additional wealth created beyond that point tends to be associated with negative outcomes for human development or the natural environment, or both. Explaining this phenomenon in detail would most likely require a separate study. However, one can formulate a thesis that if increases in wealth do not go hand-in-hand with increases in equality of wealth distribution, high levels of concentration of wealth may dramatically encourage the narrowing of the encompassing interest that controls the distribution of resources and developmental opportunities in a society.

The relationship between GDP per capita and the Foresightedness Index



• At the level of sub-components on IKS, as far as the measure of "assets" is concerned, Norway is at the top of the list, followed by Sweden, Finland, Republic of Korea and Denmark. On the side of "advancement," the first five countries are Sweden, Switzerland, Germany, Canada and Japan. And in the all important "foresightedness" category, Denmark leads, with Austria, Slovakia, Costa Rica and Switzerland completing the list of the top five. As has already been mentioned, the Knowledge Society is not only about technological innovations, but also about human beings, their personal growth and their individual creativity, experience and participation. That is the reason why sub-components of IKS comprise many different dimensions of growth and development in which very few countries (practically none) manage to perform equally well.

This generates the incentive to understand the challenge of transformation into a Knowledge Society and all the complex ingredients of this process. To use the new resource of mass-produced knowledge in the public interest, i.e. as a means to achieving a high level of human development for all people everywhere, societies should weigh carefully their choices. Genuine participation of well-informed and well-equipped citizens; limitless development of people and limitless development of information; building liveable states[8] as homes for knowledge societies; and putting resources into development of knowledge "to be," "to co-exist" and "to maintain developmental equilibrium" can constitute a choice. So can saturation of a society with ICT; exaggerated stress on education in science and engineering; and focusing investments on R&D facilities and on development of the knowledge "to do" – the source of technological innovations. These choices do not exclude; they complement each other. Yet, with all the talk about change and transition in the world today, there is precious little mention of the former, as if the latter were able to account for the whole paradigm shift that we are facing. This is misleading. If followed, this would constitute a wrong turn on the road to the future.

Wrong choices that can lead to misuse of the new resource of mass-produced knowledge can be truly catastrophic. They can build social inequalities that are far deeper and much more hurtful than anything experienced by mankind till now. In their extreme, they can become dangerous to life. That is why understanding the pattern of change brought about by mastering the skill to mass-produce knowledge is most important: for politicians, for business leaders, for governments – but first and foremost for the public at large.

These days, it is popular to repeat the *cliché* that mankind is entering the Age of Knowledge (or the "Age of Information" for many). However, it is far more important to understand that actually mankind is being invited (forced?) by the advent of the capacity to mass-produce and mass-utilize knowledge to enter the Age of Responsibility. And there is nothing easy or automatic about accepting this invitation. Being responsible takes an effort. It often prompts change. It challenges the status quo.

All this calls for a well-informed and open debate, local and global, that would lead to responsible policy choices. While the parameters of this debate are becoming clear, no universal patterns of action are available to emulate. Effective solutions, if and when they come, are bound to be local. This opens up great developmental opportunities for all. This also constitutes the incentive to start that debate early: it may lower the cost and increase the benefits of the forthcoming transition.

Notes

1 The Report adopts the concept of **"shared spaces for knowledge creation"** that mirrors the theory of ba. Ba has the following characteristics: (1) Self-organization, with its own intention, direction and mission. Participants in a ba must get involved and cannot be mere onlookers. A good ba needs chaos, care and love, as well as intention and direction. (2) An open boundary that allows both cocooning, i.e. developing one's own context, and openness to other contexts. (3) Transcending the habitual patterns of time, space and self. Ba lets participants share time and space and transcend their own limited perspectives or boundaries. (4) Multi-discipline and multi-viewpoint dialogues. A good ba enables essential dialogues that allow participants to see themselves through one another. The quality of the conversations we create is one of the most important measures of the quality of ba. (5) Equal access to the centre and maximum capacity with minimum conflict. Every participant in a good ba is at the same distance from the centre. However, the centre is not a fixed point. In ba anyone has the potential to be a centre and the centre can change as the context evolves. Ba as a sphere is constantly moving.

2 **Tacit knowledge** is a fluid mix of framed experience, values, contextual information and expert insights that provides an individual with a framework for evaluating and incorporating new experiences and information. Tacit knowledge is information combined with experience, context, interpretation and judgement. It is acquired through one's own experience or reflections on the experiences of others. It is intangible, without boundaries and dynamic. It is highly personal and hard to formalize, making it difficult to communicate or share with others. Subjective insights, intuitions and hunches all fall into the category of tacit knowledge.

3 **Explicit knowledge (information)** refers to "justified (true) belief" that is codified in formal, systemic language. It can be combined, stored, retrieved and transmitted with relative ease and through various means, including modern ICT.

4 "New meaning" is the additional value generated by creative processing of the available information by people and measured by greater and/or new applicability/usefulness of the processed information, as compared with the originally available information.

5 Mancur Olson, in his book, *Power and Prosperity: Outgrowing Communist and Capitalist Dictatorships* (Basic Books, 2000), puts forward a thesis that growth and development in a society depend on the broadness of the **encompassing interest** represented by those who control public power and are able to direct public resources and developmental opportunities. An autocrat or a tiny controlling minority in a democracy can afford not to be concerned with the damage that their actions bring to the society as a whole. Thus they not only usurp the right to a disproportional share of public resources and developmental opportunities, but as a rule do not bother to organize the society in ways that would help the less powerful groups. As a result, human development suffers, some markets do not exist, and full potential for growth and development is not realized. He writes, "Astonishingly, sometimes [democratic] majorities and especially super-majorities have a sufficiently encompassing interest in society that they will out of pure self-interest, forgo redistribution to themselves and treat the minority as well as they treat themselves. Whenever there is a super-encompassing interest, the second invisible hand – the one that guides encompassing interest in the use of coercive power – works in complete accord with the interest of all."

6 In classical economy, **negative externalities** are the adverse economic effects that a transaction has on third parties. Under competitive pressure, by definition, the contracting parties cannot take into consideration whatever happens with society or the biosphere (good or bad), even if it is directly related to the contract. They aim at the market-clearing price: the lower the cost reflected in the price, the greater the opportunity for profit. One can change this equation by technological progress or shedding part of the cost "for free." Economically rational people would always make a determined effort to shift part of the cost to voiceless participants in the economic game – disenfranchised labour and the mute biosphere. This is an addictive opportunity and power helps feed the addiction. If the biosphere has been regaining a voice, for instance by demonstrating the negative effects of global warming, for every advocate of the biosphere, money can buy at least one advocate of unrestricted business activity. If labour unionizes, the global market allows taking work to unregulated labour markets. Mass production of the knowledge "to do" cannot change such mindsets and such behaviour. To the contrary, it offers more opportunities for feeding this addiction by opening

new markets that follow new demand. As a result, the pace of building the pressure of "net negative externalities" on people in primary and secondary labour markets, and on the biosphere, may only increase. But nowadays this goes beyond wages below the poverty line, perpetuating poverty, pollution, depleting ozone or causing global warming. Recently, technological innovations have started to provide investors with opportunities to profitably introduce to society, products with very questionable and potentially harmful effects on life – human life and life in general. The currently existing market would not have any incentive to refuse them as long as demand for them exists or could be artificially created. Thus, in the framework of the currently existing market, mass-produced knowledge "to do" can hasten the pace, broaden the scope and sharpen the harm to human development and to the biosphere that is caused by negative externalities. On the other hand, we know that since the mid-19th century technological progress has been proving the anti-capitalist thinkers wrong by raising productivity and thus providing a cushion that allows the system to continue. Till now though, it has been about real incomes and managing the supply of opportunities for human development. This time around, it would be about all that, plus the safety of life. A "silver bullet" of technology is not likely to solve our social and environmental problems. This would require inter alia different mindsets. This would require also markets that go to "rehab" and start to clear at "addiction–clean" levels.

7 The analysis run is a local polynomial regression.

8 The idea of the **"liveable state"** reflects the belief that the welfare state (national autonomy in social policy) may evolve into a liveable state (national autonomy in maintaining a **liveable neighbourhood**). In such a state, social institutions would guarantee as a minimum, rule of law; peace; human rights and freedoms; non-discrimination of any kind; a culture of democracy and open political process; credible and competent public administration; a solid social safety net; accessible and affordable education (lifelong learning), health care, ICT infrastructure; a legal and financial environment conducive to private business activities; and a clean natural environment.

Introduction

"The profound global changes that we are facing today will be comparable in depth and magnitude to those, which brought about the shift from the agricultural to the industrial society. This change should be addressed successfully through careful and wise policies." [9]

"Proliferation of technical knowledge alone is not enough to constitute living in a knowledge-based society. The greatest problem with the knowledge society is that it is an unfruitful metaphor and an unenlightening addendum to the idea of the knowledge economy." [10]

Question 1: Why is it important to understand Knowledge Societies?

Top 10 reasons:

1. Not to drown in the alphabet soup …

The word "knowledge" or "k-" in its abbreviated form has become a prefix and is widely used in modern parlance regarding developmental challenges and transformations. In this role, it has joined a myriad of other now fashionable prefixes: "information" and "i-," "digital" and "d-," "electronic" and "e-," "mobile" and "m-" or "networked" and "n-." All these terms relate to some aspects of the introduction of modern information and communication technology (ICT) into our lives. They qualify important terms: society, community, government, citizens, business, economy, etc. These terms (so prefixed) appear in discussions about developmental trends and goals. They appear in strategy and policy papers, in policy platforms and programmes as well as in political speeches and debates. Thus, they warrant our keen attention.

Additionally, the liberty with which they are being used almost gives license to apply them interchangeably or as a matter of style[11]. So, while some talk about "information society," others speak about "knowledge society." Are these the same and should we therefore not pay attention? Or should those who are being assured that their governments are leading them towards an "information society" feel more (or less) secure, as compared with citizens who are being told that a "Knowledge Society" is in their future? Specific words carry specific meaning. Therefore, what meaning is being conveyed by the usage of these prefixes? Is "d-business" the same as "e-business"? Is "d-economy" the same as "k-economy?" And will we be "m-" or "n-citizens"? Finally, will our governments be "e-governments" (a familiar term by now) or rather "k-governments"/"m-governments" (emerging terms), and should we welcome this or be concerned about it?

2. To recognize the importance of the focus on knowledge …

From this alphabet soup, this report picks "k-" that stands for "knowledge." It does so with the hope that when an understanding is reached about what "Knowledge Society" means, this understanding can then serve as a marker for judging the rest of the discussion about our joint future, in which opportunities introduced by modern ICT will feature prominently. It is hoped that this will contribute to an understanding of the important trends

and phenomena that people should be aware of and watch with keen interest so as to manage and shape them for the benefit of all of us.

The choice of "knowledge" has not been accidental or at random.

The term is rooted in the firm conviction that it is knowledge[12], not information per se or modern ICT alone that will redefine and enrich our lives.[13]

It is rooted in experience with the quickening pace of change in the entire environment in which people live and work.[14] This experience tells us that in situations characterized by chaos, complexity and flux (C2X), when the problem context lacks structure and certainty of outcome, decision makers are wise to switch from relying on a steady flow of information to tacit, intuitive knowledge.[15]

Finally, and perhaps most importantly, it is rooted in the recent realization that the end of the 20th century has brought us much more than modern ICT. Humanity has acquired a new, very powerful skill: we have learned how to mass-produce knowledge. We have acquired this new ability in a generic way. The method is not limited in its application to a specific area of human activities.

3. To appreciate the framework in which knowledge can be put at the service of human development …

This mixture of justified hopes, positive expectations and new capabilities makes the development and application of knowledge, as well as living in the "Knowledge (-based) Society," the overriding interest of society as a whole. By and large, people believe that knowledge in all its many guises will bring them closer to the elusive goal[16] of high quality of life for all people everywhere.

It does not mean that this development and its consequences have already been broadly understood in the world or that we already use the new skill to mass-produce knowledge to the extent of its full potential. But the new developmental opportunity is out there, confronting all social institutions[17] everywhere. It would be very difficult – short of impossible – to put this Genie back into the bottle and the long-term cost of any such attempt would be tremendous. Rather, if necessary, social institutions would have to adapt. Such transitions are eventually about the redistribution of wealth and power. Thus this process cannot be safely branded as purely "technology-related" or "business-focused." It has to be seen in its true nature – as the political issue of our times.

The world that is facing this transformation is by and large organized to channel conflicts of interests into public space and to resolve them by democratic means. It is also organized to bring the vast array of human needs to the marketplace and to satisfy them by division of labour and by trade. Indeed, when we speak about bringing mass-produced knowledge into our lives, we are also talking about putting it in the midst of democratic politics and market economics.[18]

This has very significant consequences.

4. To see more clearly the magnitude of the challenge on the side of politics …

Today, the currently existing democracies[19] feature minorities[20] that are capable of influencing public policy and using public control of power in their own interest.[21] That such minorities exist is normal. That they are able to influence public policy and use the public control of power in their own interest is an historic phenomenon. These minorities are minuscule in terms of the percentage of population that they represent and thus they can afford to ignore the damage that their actions bring to the society as a whole. They can exist as a result of an ineffective democratic process in which individual citizens remain politically passive. When such a situation prevails, public policy and publicly controlled power can

be used to redistribute public resources and developmental opportunities in the direction of the controlling minority so as to satisfy the narrowly defined interest of that minority. This is how – on the other side – deficits in the supply of resources and developmental opportunities occur. Such deficits translate into human under-development.[22] To reverse this trend, a transition would have to occur: a democracy featuring a controlling minority with a narrow encompassing interest (as currently existing democracies do) would have to become one that features a controlling majority with a super-encompassing interest – a situation in which public power is used in accord with the interests of all[23] (see Box 1).

This generic description seems to hold for most of the world, locally and globally. The only difference between the local and the global level is that in a world with global reservoirs of public revenues, in terms of the percentage of the global population, the minority is even tinier and the incentives to ignore the damage to the whole are even bigger.

5. To see more clearly the magnitude of the challenge on the side of economics …

Almost everywhere, these minorities are home to the economic elite. They are involved in economic activities and, as owners of financial capital and investors, use the institution of the market for organization of the economy. They also use their political position to improve their standing in the market and thereby by-pass competition in the economic sphere. Under the currently existing market conditions, unbridled competitiveness and the quest for efficiency and profit provide producers of many goods and services with incentives to eliminate part of the real cost of production from the calculation of prices at which these goods and services are offered in the market. And, increasingly, the mass-produced knowledge "to do" offers profitable investment opportunities in products with high risk content.

The difference between the full cost of production and the worth of goods and services as they appear in the market adds up to profit for the producer and loss to society as a whole in the amount of the worth of the negative externalities. This has always been true. Today, the loss is compounded by the very nature of some of the products that come to the market with less then total assurance about their safety for human life and life in general.

In the marketplace, all bills have to be settled eventually, even if only in the long run. The ones on the side of the loss to society as a whole are paid as a rule in lost human developmental opportunities, in degradation of the biosphere[24] and, increasingly, in a greater risk to life – directly or via specific ways in which the biosphere is affected. Naturally, a society can force renegotiations to reduce or eliminate the loss to society as a whole. Naturally, the minority's control of public power is usually effective enough to prevent this. This control is often enforced by collusion among the economically active minority, the government, at least part of the academic establishment and the culture industry.[25] To reverse this trend a transition would have to occur from a market addicted to maximization of the "loss to society as a whole" – as the currently existing market is – to one that achieves economic efficiency without shedding cost of production with disregard for people and the biosphere. This would require the market to meet the demands not only of consumers, but also of well-informed citizens.[26]

Right now, global markets with no agora for the global demos, local governments eager to win the global race to the bottom, and global investors and international financial institutions that reward the winners in this race all create an environment that feeds the markets' addiction.

6. To know what questions to ask …

Enter mass-produced knowledge.

If such knowledge were to thrive in the above-described framework of the currently existing market democracies, no institutional change would be needed. To pronounce on this key issue one would have to look at how this framework is able to support the mass production and mass utilization of knowledge. We can gauge this by focusing on its structural features and by seeking answers to the following questions:

1. What is the level and geography of human development and of information development needed to support the mass production of knowledge?
2. Is the above-described framework of democratic politics and market economics, with its current peculiarities, able to assure the needed level and geographic distribution of human development and information development?
3. On balance, what impact on the loss to society as a whole, as described above, would mass-produced knowledge have?
4. In case mass-produced knowledge were to increase the loss to society as a whole, would this loss be beyond the carrying capacity of the society and the biosphere?

[As far as the last question is concerned, the jury may still be out, but even at the current speed and volume of growth of development and knowledge creation, there is enough documented evidence of taxing this capacity to its limits. Without waiting for the final verdict of history, the prospect of the mass-produced knowledge that would follow the previous developmental path has already impacted people's thinking: in the post-modern world, we tend to broaden the scope of the developmental goal for humanity. It reads now: high level of quality and safety of life.][27]

7. To know what to watch …

If the above institutional framework were to prove unable to support the desired levels of quality and safety of life; on balance, if it were to use mass-produced knowledge to increase the loss to society as a whole related to market production of goods and services; and if it were to do this in ways that exceeded the carrying capacity of the society or the biosphere, institutional change would be unavoidable. This institutional change would have to effectively address three main issues:

1. Circumstances in which an institutional setting that locks up power in less than super-encompassing interest can be amended;
2. Incentives, opportunities and resources for individual citizens to become politically active; and
3. Mechanisms for greatly reducing or eliminating altogether the loss to society as a whole generated in the process of market-driven production of goods and services.

8. Not to be fooled by the false notion of progress …

The term "Knowledge Society" tends to carry a positive message. We tend to associate knowledge with "progress." Thus, true understanding of Knowledge Societies is important, as the notion of "progress" perceived just as "advancement" (of what?) or "a move forward" (to where?) may be very misleading.[28]

"Progress" can mean more wealth, no matter how this wealth is distributed.
"Progress" can mean more knowledge, no matter how this knowledge is used.

"Progress" can mean ever-increasing levels of quality and safety of life, i.e. human development in its broadest of interpretations.

"Progress" can mean ever-greater capacity to situate humanity in space and time, to become conscious of people's place and responsibility in relation to the universe.

9. To notice the fork in the road …

Real power – especially in politics and in business, but also in family and community life – comes today from recognizing the patterns of change, often on the basis of small differences capable of causing powerful effects.[29]

If we were to agree that the single most important agent of change is modern ICT, including the Internet, then the pattern of change would feature increased importance of well-managed information only. Such understanding seems to underpin a lot of thinking in the world today. Accordingly, "progress" might be interpreted as resolution of the tension between technology and organizations on the public administration (e.g. e-government) and business (e.g. e-business) sides. Securing a large share of the emerging market for ICT-based or ICT-related goods and services would also be perceived as "progress" in this context. The broader tension between technology (modern ICT) and society might be depicted and approached in terms of information management only.

If, on the other hand, we were to agree that the single most important agent of change is the newly acquired capacity to mass-produce knowledge, then the pattern of change would have to relate to the status of factors that enable the mass production of knowledge. In such a situation, "progress" would mean an institutional shift that would allow successful engagement of these factors by society and enabling their ability to realize their full potential.[30]

10. To be well-informed in the ensuing debate …

Any considerable shift of the institutional framework constitutes one of the most complex tasks that a society can face. It is about choices that are hard to make. By definition, these challenge the status quo.

However, if the shift of the institutional framework were needed to facilitate transition to the Knowledge Society, then inaction would have converted the turn of the century into a moment in history during which human creativity would have unleashed powers that the social organization of humanity would eventually fail to manage.

This does not have to happen, and that is why an open, well-informed political debate around the Knowledge Society must now occur. In some sense, in some aspects, this debate has already started.

Many concerns are profound.[31] Many emotions are intense.[32] Many solutions are known.

For instance, in the United Nations Millennium Declaration adopted in September 2000, the nations of the world have outlined their preferred roadmap for future global institutional change (see Box 2). It is far-reaching, especially in its pronouncements on governance and values. It reads like a blueprint for world-making. It talks about a more peaceful, prosperous and just world. It weaves a dream of shared future based on common humanity in all its diversity. De facto, it speaks about many building blocks of the Knowledge Society and of a home for the Knowledge Society.

Box 1

Power and prosperity: the case of narrow and broad encompassing interest

"If markets breed prosperity, why don't the ubiquitous markets in the low-income economies make these economies prosperous (…)? [There are] only two general conditions for a market economy to generate success: (…) secure and well-defined individual rights (…) [and] absence of perdition of any kind. These two conditions are most likely to be satisfied (…) in secure, rights-respecting democracies (…). Though lasting democracies (…) suffer from narrow special interests, it is by no means inevitable that this must always be true. (…) Narrow special interests are always tiny minorities. The problem is [not with their existence, but with the fact] that minorities so tiny that they have an incentive to ignore the damage that they do to society [as a whole] nonetheless (in part because of the ignorance of the mass of the citizenry) are able to influence public policy (…).

Consider the incentives facing an individual criminal in a populous society. Other things being equal, a criminal is better off in a rich society than in the poor society: there is more to steal. (…)

In the 1920's, China was in large part under the control of various warlords. They were men who led armed bands with which they conquered a territory and then appointed themselves lords of the territories they had conquered. They taxed their subjects heavily and used the proceeds to serve their own interests. (…) a bandit leader, if he is strong enough to hold a territory securely and monopolize theft there, has an encompassing interest in his domain. (…) He serves his interest by spending some of the resources that he controls to deter crime among his subjects and to provide other public goods.

(…) the improvement in outcomes that arises when there is a shift from the destructive to the constructive use of power (…) is due to another invisible hand. This invisible hand – shall we call it the invisible hand on the left – guides encompassing interests to use their power, at least to some degree, in accord with the social interest, even when serving the public good was not part of the intention. (…)

[A candidate in democratic elections] needs only a majority to win, and he may be able to "buy" the majority by transferring income from the population at large to the prospective majority. The taxes used for this transfer would impair incentives and reduce society's output just as an autocrat's redistribution to himself does. (…) Astonishingly, sometimes [democratic] majorities and especially super-majorities have a sufficiently encompassing interest in society that they will out of pure self-interest, forgo redistribution to themselves and treat the minority as well as they treat themselves. Whenever there is a super-encompassing interest, the second invisible hand – the one that guides encompassing interest in the use of coercive power – works in complete accord with the interest of all."

Source: Mancur Olson, *Power and Prosperity: Outgrowing Communist and Capitalist Dictatorships*, Basic Books, 2000

Box 2

United Nations Millennium Declaration (excerpts)

"(…) We believe that the central challenge we face today is to ensure that globalization becomes a positive force for all the world's people. For while globalization offers great opportunities, at present its benefits are very unevenly shared, while its costs are unevenly distributed. (…) Only through broad and sustained efforts to create a shared future, based upon our common humanity in all its diversity, can globalization be made fully inclusive and equitable. These efforts must include policies and measures, at the global level, which correspond to the needs of developing countries and economies in transition and are formulated and implemented with their effective participation. (…) Men and women have the right to live their lives and raise their children in dignity, free from hunger and from the fear of violence, oppression or injustice. Democratic and participatory governance based on the will of the people best assures these rights. (…) No individual and no nation must be denied the opportunity to benefit from development. (…) The equal rights and opportunities of women and men must be assured. (…) Global challenges must be managed in a way that distributes the costs and burdens fairly in accordance with basic principles of equity and social justice. Those who suffer or who benefit least deserve help from those who benefit most. (…) Human beings must respect one other, in all their diversity of belief, culture and language. Differences within and between societies should be neither feared nor repressed, but cherished as a precious asset of humanity. A culture of peace and dialogue among all civilizations should be actively promoted. (…) Prudence must be shown in the management of all living species and natural resources, in accordance with the precepts of sustainable development. Only in this way can the immeasurable riches provided to us by nature be preserved and passed on to our descendants. The current unsustainable patterns of production and consumption must be changed in the interest of our future welfare and that of our descendants. (…) We resolve therefore to create an environment – at the national and global levels alike – which is conducive to development and to the elimination of poverty. (…) Success in meeting these objectives depends, inter alia, on good governance within each country. It also depends on good governance at the international level and on transparency in the financial, monetary and trading systems. (…) We resolve: (…)To ensure that, (…) children everywhere, boys and girls alike, will be able to complete a full course of primary schooling and that girls and boys will have equal access to all levels of education. (…)To promote gender equality and the empowerment of women as effective ways to combat poverty, hunger and disease and to stimulate development that is truly sustainable. (…) To ensure that the benefits of new technologies, especially information and communication technologies, (…) are available to all. (…) We will spare no effort to promote democracy and strengthen the rule of law, as well as respect for all internationally recognized human rights and fundamental freedoms, including the right to development."

Source: UN Resolution 55/2, *United Nations Milenium Declaration*, adopted by the UN General Assembly on 18 September 2000

Notes

9 Michel Demazure, "New governance for a new society," Organization for Economic Cooperation and Development, *The OECD Observer*, Paris, July 2001, p 3

10 Sheldon Ungar, "Misplaced metaphor: A critical analysis of the 'knowledge society," *The Canadian Review of Sociology and Anthropology*, Toronto, Aug. 2003, Vol. 40, Issue 3; p 331

11 For instance, by his own admission, Toffler uses the words "data," "information" and "knowledge" interchangeably throughout his book "to avoid tedious repetition." See: A. Toffler, *Powershift: Knowledge, Wealth and Violence at the Edge of the 21st Century*, Bantam Books, 1990

12 For definitions of knowledge, information and tacit knowledge please see Answer to Question 2, below.

13 This conviction is broadly shared. Drucker, the author of the concept of "knowledge work" and "knowledge worker," while adopting a specific focus on business firms and industrialized countries wrote, "The single greatest challenge facing managers in the developed countries in the world is to raise the productivity of knowledge and service workers. This challenge that will dominate the management agenda for the next several decades, will ultimately determine the competitive performance of companies. Even more important, it will determine the very fabric of society and the quality of life in every industrialized nation." See. P. F. Drucker, *Post-Capitalist Society*, Oxford: Butterworth Heinemann, 1993.

14 Compare also: "The waves of change are sweeping the world – digitization, globalization, demographic shifts, migration, and individualism, as well as the rapid degradation of the social and natural capital – are giving rise to arenas of clashing forces. These clashing forces play out as tensions between multiple polarities: speed and stability, exploration and exploitation, global and local ways of organizing, top-down and bottom-up approaches to leadership. Although general statements like the one above have been true at many times and places in human history, there is something different about today's circumstances. The pace of change is somehow faster, the frequency and amplitude of restructuring and reforming are significantly greater, and the pathways of emerging futures seem to be less predictable than they were in earlier times." C. Otto Scharmer, W. Brian Arthur, Jonathan Day, Joseph Jaworski, Michael Jung, Ikujiro Nonaka, Peter M. Senge, "Illuminating the Blind Spot: Leadership in the Context of Emerging Worlds," www.dialogonleadership.org. Anthony Giddens summarizes this situation in *The Consequences of Modernity*, Stanford University Press, Stanford, CA, 1990 as "**institutionalization of doubt**."

15 Compare: "(…) when the problem context is highly structured (the problem is easily defined and solutions are well known) decision makers place greater confidence in automated technology and information. When the problem context lacks structure and the certainty of outcomes, decision makers tend to rely on tacit, intuitive knowledge." Source: Mary Maureen Brown and Jeffrey L. Brudney, *Learning Organization in the Public Sector*.

16 It is important to distinguish here between **goals** that a society may usefully formulate as a result of free debate and consensus-building – goals that function as a shared vision/understanding and become part of shared culture – and goals formulated by the State, especially with little genuine participation. The former function as a collective dream or a social compass. They provide support to the connective fabric in a society. This still allows people to live their own lives according to their own ideas. The State does not impose its goals on them. Its organs can be enlisted among other social institutions and organizations as agents of the people in supporting the socially formulated goal/vision/dream. Situations in which the State formulates and pursues goals of its own are as a rule anti-social. More often than not, such goals embody the will of groups with narrow encompassing interests. Too often they result in policies of oppression inside the countries and wars of conquest outside. The goal then plays the role of the universally applicable justification.

17 This Report defines an **institution** as a well-established method, usage, practice, custom, convention, pattern, order, regulatory principle, law or other element in the political or social life of a people, accepted as a fundamental part of culture, subservient to the needs of an organized community or the general ends of civilization.

18 A very low percentage of humanity lives in countries that do not define themselves as **democracies**. And while in many, abuses of civil rights (including exclusion by social or economic status) question their political status, in all but a few the basic democratic institutions exist, even if in vastly underdeveloped and underutilized form. An even smaller percentage of humanity lives in "un-ruled

territories." These are parts of nation states that the rule of law – as imposed by the coercive power from the centre – does not reach. Most such societies follow tribal governance with strong executive power and a form of collective decision making. In some, whole groups of the population are excluded from participation in governing (e.g. women.) As to **markets**, the era in which their total suppression has been the key public policy is as well as over. "(…) markets are spontaneous and often irrepressible. Trade often takes place [even] in the absence of a common culture or institutions to facilitate it and often in environments hostile to the markets. (…) We should not be surprised that a great deal of trade occurs even in inauspicious conditions. The gains from the division of labor and trade are, in the aggregate, so immense that most of the world's population could not survive without them. (…) Thus some markets exist virtually everywhere, even when there is no legal system to enforce contracts and sometimes also when trade is illegal." Mancur Olson, 2000, ibid.

19 This Report – as will become clear throughout the whole presentation – is firmly on the side of **democracies** that rest on individual rights and popular sovereignty. It supports the notions of equality under the law and self-government of free people. It also cannot but observe that the "currently exciting" democracies are imperfect in that they lack depth. The opinion expressed in the Report, as elaborated below, is that this depth can be recovered by supporting individual rights with human capabilities and by shifting power towards popular sovereignty and away from groups with less than popular encompassing interests.

20 Fernand Braudel *[The Wheels of Commerce*, University of California Press, Berkeley – Los Angeles, 1992] writes, "Conspicuous at the top of the pyramid is a handful of privileged people. Everything invariably falls into the lap of this tiny group: power, wealth, a large share of the surplus production. This is the group that governs, administers, directs, takes decisions, sees to the continuity of investment and thus of production. To this group flow all goods, services, currencies. Below it ranges the multitude of economic agents, workers of very rank, the mass of the governed. And below everyone else, stretches the huge social scrap heap, the world of the unemployed. (…) What is so surprising is that the privileged should always be so few. Since social advancement does exist, and since this tiny elite has always depended on the surplus provided by the labor of the unprivileged, whenever that surplus increased, the tiny elite at the top ought to have expanded too. But it never has – even in the twentieth century."

21 Compare: "[It is crucial] to rediscover the path to social justice. I say 'rediscover' because the dominant ideology of the last few decades has dealt heavy blows to the ideals of equality and fraternity, and also because the statistics and available indicators confirm the effectiveness of the anti-egalitarian propaganda. In the world as a whole, inequalities of all kinds are on the increase: between countries, of course, but even more manifestly, between social groups. (…) an affluent class, which is in the position of dominance, in terms of revenue, knowledge, social relations, potential and hope, holds all the cards and makes this known to those who are at the bottom of the scale and suffer, but also makes it known to those of the middle classes, who experience a feeling of growing insecurity. (…) Laissez-faire and the retreat of the [social functions of the] State, in deference to private and particularistic interests, are the source of inequalities and injustices that no civilized society should countenance." Jacques Baudot, "The Necessary Reinforcement of States," a paper prepared for the panel discussion "Third Way," held at the United Nations in New York on 10 November 1998 (unpublished).

22 "(…) human development requires the removal of major sources of un-freedom: poverty as well as tyranny, poor economic opportunities as well as systematic social depravation, neglect of public facilities as well as intolerance or over-activity of repressive states. Despite unprecedented increases in overall opulence, the contemporary world denies elementary freedoms to vast numbers – perhaps even majority – of people. (…) [There are] five distinct types of freedom (…): (1) political freedoms; (2) economic facilities; (3) social opportunities; (4) transparency guarantees; and, (5) protective security. (…) Individual freedom is quintessentially a social product, and there is a two-way relation between (1) social arrangements to expand individual freedoms, and (2) the use of individual freedom not only to improve the respective lives but also to make the social arrangements more appropriate and more effective." See Amartya Sen, *Development as Freedom*, Knopf, NY, 1999, p 3

23 This is an idea that in various forms has been advocated in the literature devoted to growth and development, both in countries with economies in development and with developed economies. William Easterly writes in *The Elusive Quest for Growth: Economists' Adventures and Misadventures in the Tropics*, Cambridge, MIT Press, 2001, "Prosperity happens when all the players in the

development game have the right incentives. It happens when government incentives induce technological adaptation, high-quality investment in machines, and high-quality schooling. (…) It happens when the poor get good opportunities and incentives. (…) It happens when politics is not polarized between antagonistic interest groups, but there is a common consensus to invest in the future. Broad and deep development happens when a government that is held accountable for its actions energetically takes up the task of investing in collective goods like health, education, and the rule of law."

24 The fate of the biosphere is increasingly becoming a concern not only for people worrying about the broad human development paradigm, but also for mainstream economists. Compare: "A third historical trend [Note: The article speaks about rational expectations and policy irrelevance as the two other trends in modern economic theory], whose significance is harder to judge, is the growing pressure on resources and the environment. Economics has been here before – witness Malthus, witness Club of Rome, (which in the 1970s, predicted global economic breakdown as energy and other resources run out.) In the past such apocalyptic forecasts have been rubbished by technological progress and, more importantly, by economic forces working through the price mechanism. Scarce resources become dearer; this causes them to be conserved. Will present anxieties fade too? (…) they may not. More economists are beginning to wonder whether growth is sustainable; [and] are turning their energies to environmental economics." Source, *The Economist*, 9 March 1991.

25 The **culture industry** (Walter Benjamin, Theodor Adorno) consists of the mass media system that is intricately linked with the present day dominant models of production, distribution, exchange and consumption. As a result, culture is commodified and produced by the culture industry in the same way as other goods and services. This leads to manipulation of the public, and to the growing inability of people to independently formulate and express their cultural preferences. (Source: www.whatis.com)

26 Currently, the discussion of this issue is stuck pretty much on the **"Coase theorem."** This is misleading. In the abstract world of Ronald Coase, everything that is worth anything has an owner and we deal with economic losses only. In the real world not everything that is of value can be expressed in terms of economic worth. And even if a thing does not have economic worth, it may be crucial to human existence and people depending on it can constitute the third party that is adversely impacted by contract in the marketplace. The "Coase theorem" recognizes only two players: government regulations and market forces. It replaces government regulations with market forces and invites the market forces to regulate the market. This works, if economic efficiency is the only goal; and, if we deal in sparks and local crops [Ronald Coase uses an example of a railway that owns and runs the spark-producing locomotives and farmers that own fields with crops] rather than in human development opportunities and in the carrying capacity of the biosphere. The Report suggests that it is possible and desirable that the market forces be neutered so that, instead, we have a situation in which the railway, of its own will, would not want to emit sparks. Or, the farmer community would end the scourge of sparks by sending strong corrective signals to the railway and in response, the railway would change its business model. If – for the economically-minded – this were to be expressed in economic terms, this would mean that the "property right" of mankind to opportunities for human development, and to a sound biosphere, is worth more than any legal entitlements that could have been acquired by the railway; and also, that mankind would not be willing to sell. Call this the **"Knowledge Society theorem."**

27 Compare: "Scientists now say we are in a new stage of the Earth's history, the Anthropocene Epoch, when we ourselves have become the globe's principal force. But several eminent scientists are concerned that we have become too successful – that the unprecedented human pressure on the Earth's ecosystems threatens our future as a species. [There are] six areas where most experts agree that a crisis is brewing: **Food**: An estimated 1 in 6 people suffer from hunger and malnutrition while attempts to grow food are damaging swathes of productive land. **Water**: By 2025, two-thirds of the world's people are likely to be living in areas of acute water stress. **Energy**: Oil production could peak and supplies start to decline by 2010. **Climate change**: The world's greatest environmental challenge, (…) with increased storms, floods, drought and species losses predicted. **Biodiversity**: Many scientists think the Earth is now entering its sixth great extinction phase. **Pollution**: Hazardous chemicals are now found in the bodies of all new-born babies, and an estimated one in four people worldwide are exposed to unhealthy concentrations of air pollutants. All six problems are linked and urgent, so a list of priorities is little help. It is pointless to preserve species and habitats, for example,

if climate change will destroy them anyway, or to develop novel crops if the water they need is not there. And underlying all these pressures is a seventh – human population. There are already more than six billion of us, and on present trends the UN says we shall probably number about 8.9 billion by 2050. Population growth means something else, too: although the proportion of people living in poverty is continuing to fall, the absolute number goes on rising, because fecundity outstrips our efforts to improve their lives. Poverty matters because it leaves many people no choice but to exploit the environment, and it fuels frustration. Above all, it condemns them to stunted lives and early deaths – both avoidable. Planet under pressure is more about questions than answers. What sort of lifestyle can the Earth sustain? How many of us can live at northern consumption levels, and what level should everyone else be expected to settle for? How can we expect poor people to respect the environment when they need to use it to survive? Are eco-friendly lives a luxury for the rich or a necessity for everyone? And how can we act when sizeable and sincere parts of society say we are already overcoming the problems, not being overwhelmed by them? (…) Living within the planet's means need not condemn us to giving up what we now assume we need for a full life, just to sharing it. The challenge we face is not about feeling guilty for our consumption or virtuous for being 'green' – it is about the growing recognition that, as the human race, we stand or fall together. Ingenuity and technology continue to offer hope of a better world. But they can promise only so much. You do not need ingenuity and technology to save the roughly 30,000 under-fives who die daily from hunger or easily preventable diseases. And facing up to the planet's pressure points is about their survival, and ours." Source: Alex Kirby, "Planet under pressure," BBC World News Service, accessed on 18 November 2004 at http://news.bbc.co.uk/1/hi/sci/tech/3686106.stm.

28 The idea of progress has been hotly disputed throughout history. Robert Nisbet provides a well-grounded review of these disputes in a study, *History of the Idea of Progress* [Basic Books, Inc., New York, 1980]. [The quotes that follow originate in that book.] Frederick August von Hayek is of the belief that faith in progress is justified by history (…). For Hayek, civilization is progress and progress is civilization. He says, "Progress is movement for movement's sake, for it is in the process of learning, and in the effects of learning something new, that man enjoys the gifts of his intelligence." But, a question posed by Stanley Hoffman remains worth considering, "Can one live forever in economic present, comforting oneself with comparative statistics and half-cozy, half worried enjoyment of goods, freedom and rights?" As if in response, E. J. Mishan lists various measurements or criteria of what we call the good life: "food, health, security, and shelter, of course; but also family, religion, tradition and custom. Stability of morality or of a moral code conceived in whatever way is vital to man, as are his primary modes of association: friendship, love, mutual aid, and so on." He is not optimistic: "Unlimited continuation of the kind of industrial expansion we have known for two centuries in the West must result in a slow but inexorable disintegration of the social order, and a casting of individuals into a social and moral void, one that is most likely to be filled by a totalitarian state. The cause of the decline is the very economic growth that was so widely hailed in the 18th century and in the 19th and early 20th centuries as the mainspring of progress in general – social, moral and cultural." Teilhard de Chardin sees this differently: "If we are to find a definitive answer to the question of the (…) progress of the Universe we must do so by adopting the least favorable position, that is to say by envisaging a world whose evolutionary capacity is concentrated upon and confined to the human soul. The question of whether the Universe is still developing then becomes a mater of deciding whether the human spirit is in process of evolution. (…) We [can] see that a vast evolutionary process is in operation around us, but that it is in a situation within the sphere of consciousness (and collective consciousness). The great superiority over Primitive Man which we have acquired and which will be enhanced by our descendants in a degree undreamed-of by ourselves, is in the realm of self-knowledge; in our growing capacity to situate ourselves in space and time, to the point of becoming conscious of our place and responsibility in relation to the Universe. (…) Mankind still shows itself to possess a reserve, a formidable potential of concentration, i.e. of progress… If we are to judge by what history teaches us about other living groups, it [mankind] has, organically speaking, some millions of years in which to live and develop. Everything leads us to belief that it really does dispose of the vast reservoir of time, which is necessary to the normal achievement of its evolution. We may envisage all kinds of mischance (disaster, disease) which might in theory put an end to evolutionary progress: but the fact remains that for 300 million years Life has paradoxically progressed in the Improbable. Does this not suggest that its advance may be sustained

by some sort of complicity on the part of the 'blind' forces of the Universe – that is to say, that it is inexorable?" And the dispute continues.

29 "Does the flap of a butterfly's wings in Brazil set off a tornado in Texas?" The now famous question posed three decades ago by Edward Lorenz finds its way to family dinner tables, corporate boardrooms and political think-tanks.

30 A scholar provides a taste of the things to come (with some focus on the economic use of knowledge): "The central economic and societal question of the (…) society will soon become: how to stimulate innovation, that is to say, originality of ideas. (…) It would require a fundamental shift in approach to knowledge, participation, education, and the social value of arts and intellectual ideas. (…) [In terms of public policy, this would mean] an educational system that places emphasis on creative freedom and on incentives for independent thinking; state and private sector investment in research and development of new ideas and technology; and, low levels of risk and high levels of reward for creative risk-taking in the workplace and the economy. (…) an environment of creative dynamism requires regulatory stimulation of creative enterprises, i.e. those enterprises whose products are ideas. (…) an effective policy framework would in the very least broaden access to capital; lower taxation on creative risk-taking; remove content obligations and liabilities for all entities that produce and distribute expression; ensure that a constant stream of new ideas and cultural forms trickles into public domain through 'fair use' access protections; and, assure reasonable, though not excessive intellectual property rights (IPR) for innovation in ideas, technology and science." Source: Shalini Venturelli in "Inventing E-Regulation in US, EU and East Asia: Conflicting Social Visions of the Internet and the Information Society," a paper (unpublished) submitted to the UN Ad Hoc Group of Experts Meeting on "Knowledge Systems and Development" (New York, September 2003).

31 While Sachs in his warnings narrows down the issue to technological innovations only, he is determined and convincing: "With the end of the cold war (…) a more intractable division is taking hold, this time based on technology. A small part of the globe, accounting for some 15% of the earth's population, provides nearly all of the world's technology innovations. A second part, involving perhaps half of the world's population, is able to adopt these technologies in production and consumption. The remaining part, covering around a third of the world's population, is technologically disconnected, neither innovating at home nor adopting foreign technologies. (…) Countries that do not keep up with global technology often collapse, unable to maintain their standard of living, much less increase it. They usually depend on a narrow range of exports that lose their profitability in the world economy. (…) The long-term decline in the terms of trade of many primary commodities is itself a side-effect of innovation." Jeffrey Sachs, "A new map of the world," *The Economist*, 11 July 2001. A sobering view on reasons behind these developments is provided by Joel Mokyr, 2003, ibid. "Uneven diffusion of knowledge among different societies is not the main cause of the huge and growing differences in income and living standards between developed and developing countries. There is not much in Western science and technology that Liberian or Haitian engineers could not learn in a relatively short time, if perhaps assisted by spending a few years in MIT or CalTech. But on their own, such highly trained people would search for jobs in richer countries and not go back to their home countries. Instead, the economic conditions for production/using sophisticated and interdependent techniques have to be met: stable and honest government, law-and-order, competent, reliable and compliant workers, and similar normal requirements for a prosperous society. If these are met, all that counts is the access costs to the knowledge that is already there. Given the recent sharp fall in the marginal access costs to much of this knowledge, this does not seem to be too high a hurdle."

32 Prepared for the recent United Nations Conference on Trade and Development, the "Civil Society Declaration to UNCTAD XI" reads, in part, as follows: "The official document of this Conference declares that 'globalization is a potentially significant and powerful force for growth and development.' This process of globalization, however, does not reflect the process that we observe in reality. Moreover, this view is inconsistent with the analysis presented later in the document itself, which outlines the negative impact and the concentration of wealth that have resulted from the implementation of the neo-liberal agenda and globalization. (…) [The document] does not recognize the fact that [wars fought to appropriate resources for the benefit of transnational corporations] deepen poverty and extend hunger and environmental degradation for millions of human beings. (…) does not mention the unsustainable patterns of production and consumption. (…) the reality shows

that majority of foreign capital is not a complement in the medium term of national savings, but rather is one of more obvious forms of resource transfer. The model of export-led growth promoted by transnational corporations does not lead to development, but rather to impoverishment. (…) It is not true that 'there is no alternative' to the present model of economic globalization. (…) Just and sustainable societies require national and international policies that prioritize and protect equity, democracy and diversity, human rights, labor rights, ecology, food sovereignty and sustainable production and consumption." Source: TD/407, UNCTAD XI, 12 June 2004, Sao Paulo.

Part I:
About knowledge and development of knowledge...

Main thought:	In the process of knowledge development, there are two main assets …	
	… people (as creative beings and carriers of tacit knowledge), and …	… information (explicit knowledge).
Origins of the main thought:	"New meaning" can be produced by creative reflection on the existing information by people rich in tacit knowledge. * The whole society constitutes a factory of "new meaning."	Information (explicit knowledge) can trigger reflection of people that leads to production of "new meaning." * Deployment of modern ICT in the context of knowledge development allows adding the prefix "mass-" to the production, diffusion and utilization of knowledge.
What to watch?	"Replenish-able" stock of developed people.	Channels of communication that give people access to information and allow exchanging it.
Proxy measurements suggested by the Report:	• Years of schooling • Young population	• Newspapers • Internet • Telephones

Question 2: How is knowledge definied in this report?

This report talks about knowledge in its explicit and tacit forms.[33]

Explicit knowledge (information) refers to "justified (true) belief"[34] that is codified in formal, systemic language. It can be combined, stored, retrieved and transmitted with relative ease and through various means, including modern ICT.

Tacit knowledge is a fluid mix of framed experience, values, contextual information and expert insights that provides an individual with a framework for evaluating and incorporating new experiences and information. Tacit knowledge is information combined with experience, context, interpretation and judgment. It is acquired through one's own experience or reflections on the experiences of others. It is intangible, without boundaries and dynamic. It is highly personal and hard to formalize, making it difficult to communicate or share with others. Subjective insights, intuitions and hunches all fall into the category of tacit knowledge.

To understand this duality of knowledge it may be useful to imagine knowledge as an iceberg. Its tangible, visible part that can be accessed by third persons, i.e. information, can be observed "above the water." Once it has been shared, it belongs to everybody. A large, important part of it, i.e. tacit knowledge is intangible, invisible, as if hidden "under the water" and can be accessed on the first-person basis only.

Acceptance or rejection of this understanding of knowledge has serious methodological and analytical consequences. If we believe (as this Report maintains) that we can separate in no ambiguous way the explicit from the tacit, we cannot believe at the same time that part of the tacit (or all of it) can be made explicit. This defies logic. If both "a" and "b" are essentially the same as "a," there is no "b," but rather a lot of "a." Yet, a large degree of ambiguity continues to be present in theories and concepts concerning knowledge, even those that accept the existence of the duality of the forms of knowledge, as captured by the above definitions.

Specifically, many of those who handle "knowledge management"[35] for business firms tend to reject the idea that tacit knowledge cannot be formalized and focus on attempts to apply ICT to drawing out tacit knowledge and converting it into explicit knowledge.[36] They also tend to mix up corporate learning with corporate knowledge creation.[37] Others embrace this changing environment in which the tacit /the intangible is fully recognized and in which it has moved to centre stage in analytical work and decision making of all kinds.[38] These two views represent two different ways of looking at the emerging reality. Eventually they lead to two very different understandings of this reality.

This Report embraces the duality of forms of knowledge in a categorical way.

It treats tacit as tacit, not as explicit that is trapped in people and waits to be flushed out and formalized. Therefore, when it refers to "knowledge," it refers to both distinct forms of knowledge together (i.e. to explicit knowledge, a.k.a. information, and to tacit knowledge), in other words – to the whole "iceberg." Otherwise, it will be referring to "information" (i.e. "the tip of the iceberg") or to "tacit knowledge" (i.e. "the rest of the iceberg"). And it will build its analysis on this understanding.

Box 3

Knowledge is:

…justified true belief…
Plato

…result of experience…
Aristotle

…product of the thinking self… [*Cogito, ergo sum*]
Descartes

…result of sensation and reflection… [Mind as *tabula rasa*]
Locke

…result of logical thinking of rationalism and sensory experience of empiricism that work together...
Kant

…result of sensory perception that becomes more subjective and rational through dialectic purification…
[Absolute Spirit]
Hegel

…product of pure experience by mind and body…cannot be expressed in words…
Nishida

…theoretical cognition useful for practical behaviour… [Dasein]
Heidegger

…tacit knowledge and explicit knowledge… [We know more than we can say.]
Polanyi

…iceberg…
[Explicit knowledge as the tip of the iceberg; tacit knowledge as the part hidden under the water]
Nonaka, Takeuchi, Konno

Box 4

Human knowledge and human nature: A new introduction to an ancient debate

"Philosophers may disagree with one another about the extent of human knowledge and about how much we may be said to know. At one end of the scale are various kinds of sceptics, who claim that we know very little, or at least a good deal less than we think we do. Extreme sceptics claim, for example, that we can know nothing beyond our own current state of consciousness – that is, our own present thoughts and experiences. At the other end of the scale are various sorts of realists, who maintain that we know a good deal about ourselves and the world around us. Between these two poles there is space for many intermediate positions. One, which may be worth mentioning in particular, is phenomenalism. Phenomenalists allow that most of our ordinary beliefs about physical objects do constitute knowledge, but only under a particular (non-realist) interpretation. They claim that such beliefs do not really concern a world of objects existing independently of our minds, but relate only to recurring patterns within our experience.

There is disagreement about the possible sources of human knowledge – about the avenues through which we may hope to obtain knowledge – as well. At one extreme is the position adopted by classical empiricists such as Locke and Hume, who claim that the only source of substantive knowledge is experience (understood broadly, to include both memory and introspection). At the other extreme is the view of Plato, who holds, on the contrary, that experience cannot yield genuine knowledge, since it concerns states and objects that are constantly changing. He claims that the only source of true knowledge is the human intellect, which may obtain for us knowledge of the unchanging world of forms, or universals. In between these two, lies the position of classical rationalists such as Descartes and Leibniz, who maintain that knowledge may be obtained both through experience and through the use of pure intellect. Plato's view has been endorsed by almost no one since. It derives from his peculiar conception of the nature of knowledge.

Finally, philosophers may disagree about what knowledge itself is – about how the concept of knowledge should properly be defined. This issue has not loomed very large in the work of most theorists of knowledge since Plato, at least until very recently. But in our own era a variety of accounts have been proposed. All are agreed that in order to count as knowledge something must at least be believed and be true – you cannot know that grass is green unless you believe that grass is green, and unless it is in fact true that grass is green. All are equally agreed that there is more to knowledge than mere true belief. Differences arise as to what the third component of knowledge might be. Some hold that it is justification, some that it is causation by the fact, which is believed to obtain; some that it is causation by a reliable process."

Source: *Human Knowledge And Human Nature: A New Introduction to an Ancient Debate*, Oxford University Press, 1992, accessed from http://www.philosophy.umd.edu/people/faculty/pcarruthers/hkhn-1.htm.

Question 3: If the report identifies two forms of knowledge, which of them gives legitimacy to the prefix that qualifies the "Knowledge" Society?

Both information and tacit knowledge (the whole "iceberg") stand behind the prefix that qualifies the "knowledge" society. At the same time, neither of them does that on its own. To understand this, one has to consider the "knowledge" society as a dynamic setting and examine the process of knowledge (mass) development (see Table 1).

The essence of the "knowledge" society (the one single reason that warrants putting "k-" in front of it) is knowledge development, i.e. the creation of new meaning, additional value generated by creative processing of the available information by people and measured by greater and/or new applicability/usefulness of the processed information, as compared with the originally available information. Nota bene, if this were the sole criterion, all societies could be qualified as "knowledge" societies, as in all of them, in some form, "new meaning" has always been created.

However, as mentioned above, quite recently this phenomenon has acquired a new quality: in some countries, in some social environments, experience has been gained with mass production of "new meaning" that adds to the existing pool of information and tacit knowledge, eo ipso, with mass production of knowledge. This has caused increased interest in knowledge as a factor for growth and development, coined the term "Knowledge Economy"/"Knowledge Society" and bestowed it on countries with economies featuring a relatively large and growing service sector or on economies in which manipulation of information and creation of knowledge replace industrial production as the main contributor to GDP. The global business community has become a powerful promoter of the idea of "Knowledge Economy"/"Knowledge Society." It uses the enhanced ability to mass-develop "new meaning" (in the form of technological innovations) to shorten the time of converting these innovations into marketable goods and services, and to rush with them to the global market.

If the production of "new meaning" is the essence of the Knowledge Society, one should never forget that it generates two important "by-products."

One is information that embodies "new meaning." It adds to the pool of existing information. "Old" information is not erased by the "new" information (i.e. information that embodies "new meaning"). They can exist alongside each other and continue to be used and re-used. All this constitutes the process of developing information.

The other one is the changed tacit knowledge. It changes as a result of the experience of processing information and creating new meaning. It changes as a result of the real-time internalization of new meaning as it is being produced by those who produce it. Tacit knowledge also changes as a result of broader internalization of the "new" information by the society at large. As one can lose ignorance only once, the changed, "new" tacit knowledge erases the previously existing "old" tacit knowledge. All this constitutes a large part of developing people.

Table 1. Knowledge development via creation of new meaning[39]

Process of knowledge development via production of new meaning	Stages of the process of knowledge development via production of new meaning
Knowledge creation	Socialization (sharing personal experiences rooted in tacit knowledge in the process of creative reflection on available information, with the aim of producing "new meaning");
Knowledge dissemination	Externalization (expression of "new meaning" and its translation into comprehensible forms that can be understood by others, i.e. information with the element of new meaning);
	Combination (conversion of newly-created information into analogue or digital signs that allow capturing, integrating, dissemination and editing, combining it with existing information and making it more usable);
Knowledge utilization	Internalization (conversion of newly-created information into tacit knowledge of individuals acting alone and as part of communities and organizations; society at large, i.e. inserting into existing tacit knowledge the element of new meaning and thus changing the existing tacit knowledge);
	Application and use (using developed knowledge in practical behaviour).

Question 4: What are the main drivers of a society that is defined by its ability to develop knowledge, i.e. (mass-) produce "new meaning?"

Speaking about the production of "new meaning," we talk about three indispensable ingredients of that process: (1) creativity[40] ; (2) tacit knowledge; and (3) information; or about people[41] and information[42] – the two main assets of any Knowledge Society. [People are the sole carriers of tacit knowledge and only they can access it on the first-person basis; and people are the only beings capable of creativity.]

This is new: although people and information do exist in all human societies, historically they have not been treated as main assets.

Creativity, the ability of an individual to look at the same things as everybody else and to think differently, is unique to human beings. This resource is not finite and can be explored endlessly, as has been recognized by most philosophical and religious systems. Most of these systems value people as creative beings. Some recognize the ability and the right of people to free choice. Most provide them with value structures to direct their creativity and their choices. However the link between the creativity of all people everywhere

and development has rarely been made. Rather, it appears as a silent, little recognized element in the learning and skill-development capacities of human capital and as a foundation for technological innovation. Many societies have de facto recognized the existence of the "creative class" – in politics, in arts, in letters, in science – but have never seen the rationale or an urgent need for considering creativity as a universal human phenomenon or a human right. In most societies, the structures of political and economic power have established companion structures for valuation of the accepted forms and contents of human creativity, relegating all other manifestations of human creativity to the category of (sometimes interesting) oddity.

Thinkers and leaders who have espoused humanism (more common, even as lip service) and the right to human development (less common, even as lip service) as the central ideas for their reflection and actions have also assigned priority ranking to people as goals and as means of social development. This differs though from putting people on the side of the most valued assets. For centuries, especially in the economic domain, the role of main assets has been played by land, other natural resources, fixed capital assets (e.g. industrial factories, roads, airports, etc.) or financial capital. These assets have amplified the capacities and competencies of people in their capacity of human capital and made them economically viable. When they were not supplied in sufficient quantities or when – for whatever reason – they disappeared, people faced the danger of becoming economically useless. And "economic uselessness" has had the tendency to convert people into disposable fixtures of economics and politics, potentially dangerous deviants living on the margins of social life (see Box 5). In market-dominated societies the value of people tends to be most pronounced in their capacity as consumers, who are often ranked by their spending (or borrowing and spending) potential.

Therefore, it is important to realize that highly developed people are the main asset of the Knowledge Society. In this society, the traditionally established agenda for human development has to be supplemented by opportunities to cultivate human creativity and enrich tacit knowledge. Nota bene, by definition, this embraces all people everywhere and puts them in a dynamic environment for human development. No limits for "high development" of people can usefully be established. People can develop ad infinitum.

Information has had an equally patchy and somewhat uncertain past as an asset. It was valued, of course, even at the dawn of history when, for instance, it informed people which plants were poisonous and which were not. It was treated as a dangerous nuisance when it contained the message formulated by Copernicus that the Earth was not necessarily the centre of the universe. Various censorship regimes have been set up in an attempt to regulate it. Information monopolies (political or commercial) have been introduced to curb its flow. From politically charged *pamphlets* in pre-revolutionary France and Russia to *samizdat* in the former Soviet Union, its free circulation has been valued by many. And many have risked and continue to risk their well being and even their lives for it. Still, today, we see in the policies of the commercial mass media conglomerates how the bandwidth of readily available information can be manipulated for political and commercial gain. Technical innovations are subject to various intellectual property rights (IPR) regimes. Political or economic transparency is not the norm. And, throughout the world, truthful information is often barred from political discussions and commercial dealings for the sake of profit, expediency or in order to hold on to power.

Therefore it is important to realize that highly developed (this includes well-managed) information is the main asset of the Knowledge Society. It creates information-rich environments. Opportunities must prevail to increase the density of the information-

rich environments. Nota bene, by definition, all environments everywhere can become information-rich environments. No limits related to "geography" or density of information-rich environments can be usefully established. Information can develop ad infinitum.

The realization that people and information are the two key assets of the Knowledge Society and that both can develop without limits answers the query about the level and geography of human development needed to support mass production of knowledge (see answer to Question 1 above):

Level: limitless.

Geography: everywhere.

Eo ipso, if right now, the institutional setting retards the limitless development of people and information, it retards the development of the Knowledge Society; and if transition to the Knowledge Society is desired, the institutional setting must change. If institutional change occurs and it turns out that the improvement in ability to develop people and information is less than infinite, then obviously the interest of transition to the Knowledge Society will have been compromised to accommodate some "other interest." It would be important to determine then if the "other interest" represents a rival but equally unquestionable interest of the whole society or a special interest, narrower than the interest of all.

Box 5

Poverty and social exclusion in Britain: 1600's

In 1601, during the reign of Elizabeth I, an Act of Relief of the Poor was passed, which was to be the basis of Poor Law administration for the next two centuries. It divided the poor receiving relief into three categories: (i) the able-bodied who were to have work provided for them; (ii) the rogues, vagabonds, and beggars, who were to be whipped or otherwise punished for their unwillingness to work; and (iii) the "impotent" poor (the old, the sick and the handicapped), who were to be relieved in almshouses. By the provisions of the Act, each parish was made responsible for its poor. Parishes were permitted to send paupers back to their own parish to receive relief if they became a burden. [This provision stayed in place until 1945.] The Act also made it legal "to erect, build and set up convenient houses or dwellings for the said impotent poor and also place inmates or more families than one in one cottage or house," which appears to be the initial authority for the erection of buildings later to become known as workhouses. A number of parishes took up this option realizing there was a considerable saving to be made compared with supporting paupers within their own homes or as vagrants. An 18th century poem describes such a dwelling (from "The Village George Crabbe 1773"):

> Theirs is yon house that holds the parish~poor,
> Whose walls of mud scarce bear the broken door;
> There, where the putrid vapours, flagging, play,
> And the dull wheel hums doleful through the day;
> There, children dwell who know no parents' care;
> Parents, who know no children's love, dwell there!
> Heart-broken matrons on their joyless bed,
> Forsaken wives, and mothers never wed;
> Dejected widows with unheeded tears,
> And crippled age with more than childhood fears;
> The lame, the blind, and, far the happiest they!
> The moping idiot and the madman gay.
> Here too the sick their final doom receive
> Here brought, amid the scenes of grief, to grieve.

In Liverpool, following the devastation of the Civil War (1648), displaced "yong Children and Beggars wch…are found Wandring and begging contrarie to Lawe…"shall be "shipt for the Barbadoes or otherwise to be put apprentices if ye belong to this Towne." In 1656 it was "ordered that hereafter this towne [Liverpool] shall keep and maintaine their own poore, and that the poor of all other places shalbe kept out from begging here." To further reduce expenditure a Beadle was appointed to keep out the beggars, with a bonus of 6d for every rogue whipped. [During the early 19th century, the Poor Law was often heavily criticized for its leniency and was said to discourage the unemployed from seeking work, while at the same time placing an enormous burden upon the ratepayer.]

Source: "The 19th Century Poor Law in Liverpool and its Hinterland: Towards the Origins of the Workhouse Infirmary," M.W. Royden (B.A.Hons., Cert. Ed.), accessed at http://www.btinternet.com/~m.royden/mrlhp/local/poorlaw/poorlaw.htm.

Box 6

The case of undeveloped information: corrupting impact of public secrecy

"(…) there is, in democratic societies, a basic right to know, to be informed about what the government is doing and why. (…) there should be a strong presumption in favour of transparency and openness in government. The scourges of secrecy during the past seventy years are well known – in country after country, it is the secret police that has engaged in the most egregious violations of human rights. I want to talk today about the kind of secrecy that is pervasive today in many democratic societies. Let me be clear: this secrecy is a far cry from that pursued by the totalitarian states that have marred the century that is drawing to a close. Yet this secrecy is corrosive: it is antithetical to democratic values, and it undermines democratic processes. It is based on mistrust between those governing and those governed; and at the same time, it exacerbates that mistrust.

(…) secrecy provides (…) insulation against being accused of making a mistake. (…) secrecy provides the opportunity for special interests to have greater sway. (…) the lack of information of outsiders does increase the costs of transition, and makes it more expensive [for society] to change management teams. (…) It is not only the special interests that exercise their nefarious activities under the cloak of secrecy, but the secrecy itself discourages others from providing an effective check on the special interests through informed voting.

(…) To maintain secrecy, often the circle of those involved in decision making is greatly circumscribed; those who are able to provide valuable insights are cut out of the discussion. The quality of decision making is thereby weakened. There is, again, a vicious circle. With more mistakes, public officials become more defensive; to protect themselves, they seek even more secrecy, narrowing in the circle still further, eroding still further the quality of decision making. (…) as the space of informed discourse about a host of important issues gets circumscribed, attention gets focused more and more on value issues. (…) Thus, secrecy has distorted the arena of politics. The adverse effects of secrecy are multiple: not only are important areas of public policy not dealt with effectively, but also debate focuses disproportionately on issues which are often far more divisive.

(…) A large fraction of the decisions taken in the political arena have economic consequences – not only for aggregate output, but also for its distribution. (…) It is now generally recognized that better, and more timely, information results in better, more efficient, resource allocations. (…) But the most adverse economic consequences are associated with the corruption that so often follows from excessive secrecy. (…) corruption has strong adverse effects on investment and economic growth."

Source: Joseph E. Stiglitz, "On Liberty, the Right to Know, and Public Discourse: The Role of Transparency in Public Life," Oxford Amnesty Lecture, Oxford, U.K., 27 January 1999, accessed at http://siteresources.worldbank.org/NEWS/Resources/oxforg-amnesty.pdf.

Question 5: How is abundance or scarcity of the assets that are crucial for the Knowledge Society measured?[43]

Based on the analysis presented above, the Report attempts to measure the abundance or scarcity of two main assets of the Knowledge Society: people and information.

As for people, there are two critical features that need to be captured. One is the mere quantity: how many people can a society count on and leverage to produce and use knowledge? The other aspect is represented by people's characteristics (for instance, education, skills, experience, creativity, etc.) and the degree to which they can contribute to the process of knowledge production and use.

To measure the above two features the Report has selected two indicators: the expected years of schooling of a population, and the share of population in a society that is below 15 years of age. The former is intended to capture the average amount of formal education received. The latter is intended to capture the abundance of young people that can receive (on average) that education. In other words, these two indicators are meant to capture the ability of a country to continuously feed and renew its "stock" of people who, through education, can expand their tacit knowledge and, it is hoped, develop as creative beings. [Note: There are no reliable data for life-long learning.]

However, it must be mentioned that the selected measures are not comprehensive enough. Years of schooling of an individual may serve well as a proxy for the "explicit" knowledge received by a person but say nothing about the quality of that knowledge; and not all schools develop creativity.

As for the second asset, information, the Report identifies three among the principal means through which most of today's information flows: printed means, telephone and the Internet. In order to measure the diffusion of these means it has adopted three indicators: number of newspapers per thousand people, number of Internet users per ten thousand people, and a combined indicator that incorporates the number of main telephone lines and cellular phone subscriptions per hundred people.

The results of the survey based on the five selected indicators are shown in Table 2, below. The data document a general positive correlation between the overall "wealth" of a country (as measured by GDP per capita) and its ranking on the Assets Index. In other words, when evaluating countries with higher and lower GDP per capita together, the former appear to be in a better position in terms of overall current assets for the Knowledge Society. Countries with lower GDP per capita tend to feature higher pools of young population, the great – even if untapped – national reserve.

At the same time it is interesting to note that, in the group of countries with high levels of GDP per capita, the traditional "big" economies like those of the United States, Germany and France do not seem to enjoy any special advantage over smaller economies in terms of assets required by the Knowledge Society. To the contrary, the smaller northern European countries – Norway, Finland, Sweden, Denmark and the Netherlands – are much better positioned in terms of those assets. In fact, they exhibit the highest levels of education along with excellent diffusion of information and communication technologies, and – in Norway, Sweden and Finland in particular – a very high number of newspapers per thousand inhabitants. The United States has one of the lowest ratios of newspapers per thousand people among the richest countries, followed by Canada, Belgium, Ireland and Italy.

Two Asian countries captured by this survey – Japan and the Republic of Korea (ROK) – make their appearance in the top 10 countries, exhibiting very high values on the side of the education indicator as well as in the number of newspapers (Japan tops this ranking along with Norway) and Internet users (in this latter dimension ROK is second only to Sweden).

South American countries captured by this survey (Uruguay, Chile, Bolivia, Brazil and Colombia) tend to show an excellent performance in terms of combination of education and young population: those are the countries that have relatively high expected years of education and big reservoirs of young population. These are great assets, although they are not matched by an adequate diffusion of ICT.

Eastern European countries captured by this survey, while showing good performances in education and relatively good information assets in terms of newspapers and telephones are in most cases penalized by low rates of young population and a low degree of Internet diffusion.

Table 2.
The Assets Index

	Country Name	Assets Index	Expected Schooling	Young Pop. (<15)	Newspapers per 1000 Pop	Internet users per 10,000 Pop	Phone +Cells
1	Norway	0.801	1.000	0.192	1.000	0.876	0.935
2	Sweden	0.749	0.907	0.124	0.755	1.000	0.960
3	Finland	0.714	0.981	0.125	0.772	0.887	0.805
4	Republic of Korea	0.683	0.870	0.237	0.666	0.963	0.682
5	Denmark	0.656	0.824	0.140	0.521	0.894	0.898
6	Netherlands	0.652	0.917	0.142	0.516	0.883	0.803
7	Japan	0.648	0.759	0.012	0.983	0.782	0.706
8	Australia	0.645	0.991	0.208	0.494	0.840	0.695
9	United Kingdom	0.644	0.944	0.146	0.556	0.737	0.836
10	USA	0.618	0.852	0.231	0.357	0.962	0.687
11	Israel	0.614	0.806	0.442	0.489	0.523	0.813
12	New Zealand	0.611	0.954	0.269	0.362	0.844	0.624
13	Switzerland	0.602	0.833	0.086	0.569	0.610	0.913
14	Germany	0.590	0.852	0.039	0.525	0.717	0.817
15	Austria	0.566	0.806	0.077	0.499	0.713	0.738
16	Canada	0.551	0.824	0.154	0.264	0.894	0.621
17	France	0.529	0.861	0.151	0.367	0.545	0.719
18	Belgium	0.519	0.917	0.101	0.266	0.570	0.742
19	Ireland	0.502	0.815	0.241	0.249	0.470	0.735
20	Italy	0.482	0.815	0.000	0.170	0.613	0.814
21	Malaysia	0.466	0.556	0.636	0.262	0.555	0.320
22	Czech Republic	0.464	0.694	0.069	0.427	0.444	0.686
23	Estonia	0.460	0.769	0.097	0.293	0.569	0.573
24	Greece	0.427	0.815	0.027	0.254	0.266	0.771
25	Spain	0.419	0.870	0.025	0.163	0.268	0.770
26	Chile	0.406	0.639	0.447	0.160	0.411	0.374
26	Uruguay	0.406	0.704	0.346	0.494	0.203	0.283
28	Hungary	0.389	0.694	0.077	0.310	0.271	0.594
29	Poland	0.383	0.796	0.152	0.185	0.398	0.383
30	Slovakia	0.373	0.648	0.171	0.307	0.276	0.461
31	Latvia	0.358	0.667	0.077	0.415	0.228	0.404
32	Bolivia	0.344	0.676	0.814	0.086	0.051	0.093
33	Mexico	0.338	0.500	0.637	0.160	0.167	0.226
34	Croatia	0.335	0.537	0.085	0.187	0.311	0.557
35	Costa Rica	0.328	0.380	0.558	0.148	0.333	0.220
36	Bulgaria	0.327	0.611	0.041	0.432	0.136	0.417
37	Brazil	0.318	0.676	0.465	0.060	0.138	0.249
38	Trinidad & Tobago	0.307	0.491	0.355	0.202	0.180	0.308
39	Panama	0.294	0.583	0.548	0.098	0.067	0.175
40	Tunisia	0.283	0.704	0.485	0.045	0.085	0.099
41	Colombia	0.275	0.463	0.595	0.070	0.075	0.169
42	Egypt	0.250	0.370	0.673	0.060	0.043	0.102
43	Madagascar	0.200	0.000	1.000	0.000	0.000	0.000
44	Ukraine	0.176	0.491	0.097	0.084	0.025	0.182
45	Republic of Moldova	0.175	0.333	0.250	0.094	0.054	0.141

Notes

33 This report takes as its theoretical foundation ideas about knowledge feeding on a long tradition of thought and recently re-formulated by Ikujiro Nonaka and Hirotaka Takeuchi in their book, *The Knowledge-Creating Company*, Oxford University Press, New York and Oxford, 1995 as well as Ikujiro Nonaka and Noboru Konno, in their paper, "The Concept of 'Ba': Building a Foundation for Knowledge Creation," published in the California Management Review, Vol. 40, No. 3. It adopts their definition of explicit and tacit knowledge.

34 As stressed by Henri-Frederic Amiel (See: Franklin P. Adams, *Book of Quotations*, Funk & Wagnalls, New York, 1952), "A belief is not true because it is useful." Plato too was referring to knowledge as "justified true belief." However "true" is put in parenthesis in the text. It is done in recognition of the fact that over time, many justified "true" beliefs have proven untrue although they have been considered true until disproved as true. For instance, the organizing principle of science is the search for truth. But all truths created by science are "subject to subsequent correction." While the truthfulness of the justified belief impacts the long-term quality and usability of knowledge, in the short run, untrue beliefs can function in the knowledge development process and can give birth to other beliefs that may be true. We continue to live in a world filled with untrue beliefs, only because they have proven useful. That is to say, therefore, that either we live in a world without knowledge or agree that the world of knowledge that we live in also contains some useful, but untrue beliefs. Compare also: "(…) 'truth' of knowledge is irrelevant. (…) In other words 'knowledge' pertains to what an individual believes to be true." And further down the text: "Every technique has a minimum epistemic base in the set of propositional knowledge, which contains the least knowledge that society needs to process for the technique to be invented. (…) There is no requirement that the epistemic base be "true" or "correct" in any sense. In any event, the only significance of such a statement would be that it conforms to contemporary beliefs about nature (which may well be refuted by future generations)." Source: Joel Mokyr, 2003, ibid.

35 Knowledge management can be defined as the identification, optimization, and active management of intellectual assets, either in the form of explicit knowledge held in artefacts or as tacit knowledge possessed by individuals and communities. The optimization of explicit knowledge is achieved by the consolidation and making available of these artefacts. The optimization of tacit knowledge is achieved through the creation of communities to hold, share and grow such knowledge. The active management of intellectual assets is the creation of management processes and infrastructure to bring together artefacts and communities in a common ecology that will suit the creation, utilization and retention of intellectual capital. Knowledge management technology is likely to play a strong role in management of explicit knowledge, while its role in managing tacit knowledge will primarily lie in facilitating face-to-face knowledge transfer. Source: David Snowden, "A Framework for Creating a Sustainable Knowledge Management Program," *Knowledge Management*, Caspian Publishing Ltd., London and IBM Global Services, 1998

36 An author writes, "The first judgment is whether tacit knowledge assets can be made explicit. In many cases this is not only possible, but essential. Too much knowledge is only tacit because it has been mystified by its owners in order to preserve their own authority." See: David Snowden, ibid. The opinion expressed in this Report is that the author's mistake is that he treats information (i.e. explicit knowledge) carried by people as tacit knowledge. The human brain, like the hard drive of a computer, can act as a medium for storage and transportation of information, i.e. explicit knowledge. However, information recorded and stored in the human brain should never be confused with tacit knowledge. The former can be extracted, transferred to another medium, eventually digitized and managed with the use of ICT. Until we learn how to download the whole contents of the human brain and place the human mind on a diskette, the latter cannot. It can be accessed on the first-person basis only.

37 Compare: "It seems to me that organizational learning theories do not comprehend the whole dynamic process of knowledge creation. I see [organizational] learning as related to the mode of internalization, namely conversion from explicit knowledge to tacit knowledge. Learning theories cannot explain the innovation process or the total process of organizational knowledge creation." Source: Conversation with Ikujiro Nonaka, Tokyo, Japan, 23 February 1996, accessed at: http://www.dialogonleadership.org/Nonaka-1996.html#six.

38 A recent global study of changing management practices concludes, "(…) measures that used to account for the hard variables are increasingly seen as abstract and secondary, while soft variables

such as intentions, interpretations and relationships are increasingly considered part of the more concrete and primary sphere of value creation." C. Otto Scharmer, et al. Ibid.

39 As stated earlier, while following ideas about knowledge development formulated by Nonaka, Takeuchi and Konno, this Report introduces a modification at the "externalization" stage of the process. According to Nonaka and Takeuchi, 1993, "Externalization is a process of articulating tacit knowledge into explicit concepts." Yet, this stands in contradiction to the spirit of their definition of tacit knowledge as "something not easily visible and expressible." In the extreme, while talking about tacit knowledge, we speak about "subjective insights, intuitions and hunches," about "deeply held values and emotions." To say that tacit knowledge can be articulated in explicit concepts means that there are ways to eventually draw out all of it. This does not seem true and would take socialization out of socialization, as it would render it unnecessary. To sort out these contradictions, the concept of "new meaning" as defined by this Report becomes useful. It says that what is externalized is in fact the "new meaning," i.e. the added applicability/usefulness of new information that results from creative reflection by people on the originally available information. The "new meaning" can be conveyed in "metaphors, analogies, concepts, hypotheses, or models." This formalizes it and makes it useable at the next stage of knowledge development, i.e. combination.

40 Creativity is a reflective process in which rationality interacts with intuition and a person redirects his/her perception processes, instead of letting them go automatically into the usual mental valleys.

41 As the Indian president, A. P. J. Abdul Kalam put it, there needs to be "an all-round endeavor by the industry and political leadership to transform an 'industrial society' into a 'knowledge-powered society,' to make India (…) a developed nation by 2020." According to him the three ingredients needed to move to a Knowledge Society are values, merit and quality. (…) "The transformation of rural areas to a knowledge society is therefore the key to rapid growth. The population of one billion should not be perceived as a problem, rather as an asset to kindle a multiplier effect, leading to a greater GDP." Source: "President calls for knowledge powered society," *The Press Trust of India*, 13 Feb. 2004; and "Population not a problem, but an asset: Kalam," *Businessline*, Chennai, 27 Sept. 2003, p 1.

42 Compare: "All humans are born with an innate and unique capacity: the capacity to think, learn and relate. It is the basic ingredient to the creation of knowledge. No doubt that there is a certain limit to information that human mind can store and that humans have limited time and attention span. However, we need to not forget the fact that it is the human mind that has created the technology and moved us to this highly advanced technological age. Therefore, it is capable of filtering the important from not important, the urgent from non-urgent, and the primary from secondary. Therefore, it is fully capable of functioning in a society where the knowledge is mass-produced. When one reads new information, he/she immediately should take what he/she needs and throw the rest away. Because people are able to sort out the information, the mass production of knowledge and the increased amount of information will only bring positive results – efficiency in government, increased people's participation as citizens of their countries as well as citizens of the world, increased profits in the business world." Source: http://www.cddc.vt.edu/knownet/barriers.html.

43 The methodology for ranking countries in this chapter and for the overall IKS (Index of Knowledge Societies) is explained in the Annex. However, it should be mentioned here that all this measurement effort has been done on an experimental and illustrative basis. Experimental, as while the Report is based on the belief that measuring assets, advancement and foresightedness of Knowledge Societies would be crucial for the discussion of the subject at hand, no one collects global data that address precisely the phenomena that matter here, e.g. cultural attitudes, levels of creativity in school curricula, etc. Thus, proxy indicators have been chosen carefully for the Report. This has been done with full understanding of the difference that separates correlation and causation. The combination of indices in this measuring exercise might change in the future, as more directly relevant data become available. Illustrative, as the existing international statistical databases do not provide comparable information even on these proxies for a larger group of countries than the sample presented. Thus, there is an element of randomness in the choice of the 45 countries presented and that randomness is due to the availability of data for them in all of the chosen categories.

Part II:
About advancing Knowledge Societies

Main thought:	The social institutions must allow (or be transformed to allow) limitless development and use in the process of knowledge development of …	
	…people and…	... information.
Origins of the main thought:	The currently existing democracy and the currently existing market – an environment in which societies attempt to transit to the Knowledge Society – do not allow enough space for limitless development of all people everywhere and for the participation of the whole society in knowledge development. * People are the only factor for accelerating development of knowledge that is not finite and will not become obsolete.	Right now, the "granite block" of all the information there is has been diminished by huge "chunks" of information that have been taken in stewardship by the governments and by business. * ICT as a means for accelerating production of knowledge is a resource whose impact on this process will diminish and stabilize as a constant in the future.
What to watch?	• Solutions for management of personal risk • Patterns of wealth distribution • Ability of government to produce public value • Culture of creativity and participation • Valuation of diversity • Education and learning	• Privacy • Transparency of public administrations and business firms • IPR regimes • Management of information • News media • Contexts for ICT deployment
Proxy measurements suggested by the Report:	• Gov. health expenditures • Pupil/teacher ratios • Military expenditures	• R&D expenditures
	Freedom, e.g. freedom from corruption	

Question 6: Is it not true that all societies have always been and continue to be "knowledge societies?"

As stated earlier, at some level, every society is a Knowledge Society.

Even at the most basic level of survival, a human society cannot exist for long without observing its environment, processing information about changes in that environment and producing "new meaning" that is part of that society's response to the challenge of change. A tribe in the Amazon lives by the information it possesses and obtains, and by the availability and quality of tacit knowledge that it can process creatively to come up with "new meaning" that opens new developmental opportunities or protects from looming disasters. [So does the NASA laboratory.] Throughout history, collective thinking seems to have always given better results than solitary intellectual effort.[44]

If we look at human societies through the lens of the Knowledge Society we can compare them in time and in space. We can identify situations in which the loop of knowledge development has been broken [to use more distant historic examples: very

advanced technological innovations produced in ancient China or pre-modern Russia that have not been put en masse to practical use; the many blueprints by Leonardo de Vinci].[45] We can identify situations in which the development of knowledge has existed but moved very slowly [e.g. Europe before the printing press]. And finally, we can identify situations in which its movement slowed down to a virtual standstill (imploding knowledge societies) [e.g. Europe under the Inquisition] or dramatically accelerated (advancing knowledge societies) [e.g. 19th century America as a product of European Enlightenment].

However, if we all live in knowledge societies, why do we often speak about a "transition to Knowledge Society?" One should not have to change to become what one already is.

It can be argued though that never before could people mass-produce "new meaning" and that the capacity to produce "new meaning" has never before been identified as the most important feature of human societies. The difference between societies seems to be therefore (1) in the speed with which they can produce "new meaning," (2) in the ability to produce it on a mass scale, and (3) in the many uses that these societies can find for mass application of "new meaning."[46]

It is the speed with which knowledge can be produced as well as the ability to mass-produce and mass-utilize knowledge that differentiates the advanced knowledge societies from the rest of societies.

Ergo, human civilization that is based on knowledge starts at a certain speed and volume of knowledge development and feeds off the accumulated results of that process. Now the elements of speed and volume can be introduced to the process of knowledge development as a result of a combination of two purely technical approaches: "shared spaces for knowledge creation" and ICT.

Human creativity cannot be administered or rushed. However, we have been expanding our experience with "socialization," the first step in the knowledge development process (see Table 1 above) and we understand now how people can be organized in (best if conjoined) shared spaces for knowledge creation.[47] A whole science of construction of such well-functioning spaces has emerged.[48] Experience shows that well- functioning "shared spaces" are germane to increased production (mass, speed) of "new meaning."[49] Such spaces can be viewed as true "factories of new meaning."[50]

When one changes the way in which one looks at things, the things one looks at change.

Therefore, it is useful to see "factories of new meaning" not only in R&D laboratories, but also in business firms engaged in provision of services, and in communities with a high concentration of such firms or of "knowledge workers." It is crucial to appreciate that all human endeavours that are focused on coming up with "new meaning," even if they are very local in their outreach and eventual application, and finally, the whole of society and all its distinct parts, qualify as "factories of new meaning" (see Table 3).

This vantage point, and especially the notion of the whole society as a factory of new meaning, is important. It can inform the treatment and use of the two main assets of the Knowledge Society, people and information, among those at all levels – national or community policy planners and decision makers, business firms, neighbourhoods, families. Until we start perceiving society and all its parts as the source of new meaning we will never organize it as the potential source of this element that is so vital for the Knowledge Society and it will therefore never become that source.

This notion may seem exaggerated. Do we seriously mean the "whole" society, "all people everywhere?"

Yes, if we accept the obvious: mass production of knowledge via "shared spaces for knowledge creation" is a generic technique and skill that can be learned by anyone and applied in any social setting. And as such, it continues a developmental opportunity that can be supported or denied. If it is denied, it will happen not on the basis of its unique applicability in a specific, uniquely suitable area (as there is none), but rather on the basis of institutional failure.

Yes, if we recognize the many practically possible and needed uses of mass-produced knowledge, not only a narrow type of applications. This translates into more than one kind of knowledge that warrants development.

Table 3. Locus of relationships that bring about "new meaning"

	Location
1.	Changed social life
2.	Scattered throughout society, all kinds of endeavours to process information that end in adding value (new meaning), even if it has only very local application
3.	Systems, structures and environments that facilitate knowledge development in all walks of life
4.	Communities with high concentration of: • people active in creation of new meaning; and/or • people manipulating information (this includes internationalization and utilization with adding no or minimal amounts of value); and/or • business firms in the service sector
5.	R&D laboratories

The notion of the whole society as a factory of new meaning can be compared to the notion of the market (market society) that cannot be confined to the marketplace alone, but eventually permeates social life as a whole and impacts all relationships, culture and practical behaviour. Following this example one can easily overcome the difficulty of imagining the unknown. We are not talking here about formal structures only. While purpose-driven knowledge development is present and will take place at a certain time, in a certain place and with all participants physically present, the vast majority of knowledge will be created and applied in informal, ad hoc settings. This will happen as a perpetual activity or as a stand-alone event to trigger creative interaction in a creative society, in order to cope with a singular challenge or with a continuous flow of challenges: life itself, as it happens. Eventually, this will become a habit – a way in which an individual realizes himself/herself as part of the environment on which his/her life depends.

As to ICT, it is important to recognize that it has no impact on creativity or on tacit knowledge per se. However, it is equally important to recognize that ICT can act as a tremendous facilitator of the speed with which knowledge is developed. Without it we would not be able to add the prefix "mass-" to production of knowledge. ICT can assume such a role as a result of its ability to package and move around information within the factories of new meaning and between them. It can also facilitate creation of virtual "factories" – a possibility that needs further verification, as we simply do not yet know how well "socialization" works in its tele-socialization mode.[51]

The realization that the whole society (and all its parts) can act in the mode of "factories of new meaning" sets one more important benchmark for institutional change.

If the institutional setting does not allow organizations within society to look and act like "shared spaces for knowledge creation" (see description of ba in footnote above), it retards development of the Knowledge Society. [Nota bene, we have gone through one stage of alleged knowledge-based organizational transformation already: some organizations have been purged of middle managers in an effort to make them "flatter." The result, in too many cases, was not ba, but rather hollowed out hierarchies deprived of huge reservoirs of tacit knowledge].

Furthermore, if the society as a whole has the opportunity to act like one huge "factory of new meaning," as in the case of any factory, retooling must occur to make it fit for the task. This would involve the above-mentioned institutional change. Resources would be needed to lift the level of human development, information development and also ICT capacity. If so much "new meaning" were created, individuals and organizations would need to develop the capacity to become willing, attentive receptors and competent users (implementers) of it. Furthermore, the institutional setting would have to accommodate the needed cultural shift and allow the required (re)channelling of resources to achieve these ends.

Right now it is not known everywhere or by everyone how to accomplish all this and as a rule, we lack the skills that would allow us such an outcome. To express it more precisely, this future already exists in some social settings but it is not evenly spread throughout the global society. Opening the possibility of applying it everywhere requires (mass-produced) know-how on how to organize for the mass production of knowledge. It must be developed and disseminated. If resources are needed, the prevailing institutional setting must make their flow possible.

Box 7

"New meaning" from a cup of coffee

"The coffee-houses that sprang up across Europe, starting around 1650, functioned as information exchanges for writers, politicians, businessmen and scientists. (…) [They] were centres of scientific education, literary and philosophical speculation, commercial innovation and sometimes, political fermentation.

(…) Coffee was the ideal drink. Its popularity owed much to the growing middle class of information workers – clerks, merchants and businessmen – who did mental work in offices rather than performing physical work in the open. (…) Such men were not rich enough to entertain lavishly at home.

(…) Coffee houses provided a forum for education, debate and self-improvement. They were nicknamed "penny-universities."

[In a coffee-house in London] a group of scientists dissected a dolphin, (…) scientific lectures and experiments also took place, (…) [people] reviewed and discussed latest poems and plays, (…) seamen and merchants realized that science could contribute to improvements in navigation, and hence to commercial success, whereas the scientists were keen to show the practical value of their work. (…) [These places were] hotbeds for financial information and experimentation (…), centres of political dissent. [Coffee houses] where you have the right to read all the papers for and against the government, were the seats of English liberty.

Coffeehouses were [also] popular in Paris (…), but with strict curbs on press freedom and a bureaucratic system of state censorship, France had far fewer sources of news than did England, Holland or Germany. (…) Coffee-houses like other public places in Paris were stuffed with spies.

[However], collectively, Europe's interconnected web of coffee houses formed the Internet of the Enlightenment era."

See: *The Economist*, 20 December 2003

Box 8

The Semantic Web: vision or reality?

"Some serious computer scientists, although cautious about the promise of the Semantic Web, are ultimately optimistic that it will be everything developers are hoping for – an online source for all of the knowledge humanity has created in science, business and the arts.

Under an interdisciplinary project collectively known as the "Semantic Web," computer scientists around the world are working on ways to revolutionize the Internet. The researchers – from Europe, Asia and the United States – are developing standards, protocols and technologies that will advance the development of a more meaning-oriented Web.

According to Jerry Hobbs, a computer scientist at the University of Southern California, "The aim of the Semantic Web efforts is to be able to find and access Web sites and Web resources not by keywords, as Google does today, but by descriptions of their contents and capabilities. A lot of tools are being developed right now to make that happen."

Based on an array of technologies and techniques, these tools include agent, database, language and human-computer interface technologies, in addition to a branch of research known as knowledge discovery, a field that investigates how to mine data more efficiently and effectively.

Scientists at several computer companies and at some of the world's top universities – the Massachusetts Institute of Technology, the University of Chicago, Kyoto University and Stanford University – are independently collaborating on the project, which is led by the World Wide Web Consortium (W3C). The Pentagon's Defense Advanced Research Project Agency (DARPA) – whose network back in the 1960s formed the basis for what today is the Net – is funding some of the work. Even Tim Berners-Lee, famed inventor of the Web, is contributing to the project. Researchers are hoping that the technologies under development will make it easier for users to search the Web as if it were a proprietary, private database. According to this vision, which optimists say will be realized only a few years from now, a search on the Net will be conducted according to the searcher's needs and will be expressed in ordinary language. "I want to buy a first edition copy of *Gone with the Wind* at a store in Beverly Hills this afternoon" is how searchers soon will look through search engines to find information."

Source: Gene J. Koprowski, "The Future of Human Knowledge: The Semantic Web," *TechNewsWorld*, 28 July 2004, accessed at http://www.technewsworld.com/story/31199.html.

Question 7: What has been the immediate effect of realization that knowledge can be mass-produced?

Recognition of the astounding capacities of ICT, including the fact that ICT can put information on a fast track, has provoked society's reflection on its practical application – not just as a tool for information management, but also in the context of "shared spaces for knowledge creation" for the mass production of knowledge. And while the former has been embraced relatively easily (e.g. "the information revolution," "the age of information," "information society"), the perception of the latter tends to remain shallow.

Yet, this turns out to be quite an important fork in the road. The former heralds a future that will depend on well-managed information. The latter makes mass-created "new meaning" the most dynamic factor that will determine our future. Hence, the former stresses the need for institutional change that would allow development of information. The latter necessitates institutional change that would allow (limitless) development of people and information. This "nuance" has profound consequences. In the most important "short term," it informs policy decisions with crucial "long term" effects.

Although the archaeology of the knowledge age is not yet developed, it seems that this reflection has produced in the global society at least three ideas. Various social forces[52] have adopted them. They struggle now for the freedom to put them into practice. Coming back to the assumptions about the currently existing democracy and the currently existing market, it would be useful to establish which ideas have been appealing to society as a whole and which ones have had a special appeal for the groups with interests narrower than those of the whole society.

> One thought has been on the business side. It has been about the possibility (e-business) of increasing productivity as well as profit in business operations by using ICT along the whole economic value chain: internal organization of business firms and their support systems; supplier relations; operations, including product design and manufacturing; distribution, marketing and sales; and after-sale service care. Although knowledge can and does enter this chain at any point, special stress has been put on mass production of technological innovations based on the knowledge "to do" and the sale of knowledge-based goods and services on the global market.

There are many reasons why this idea has raised the interest of the economically active groups, especially in the technologically advanced countries. It offers a promise of more wealth. Also, gains in productivity offer flexibility in increasing real incomes across the board and – in relative terms – can lower the price of advancing human development across the board. Courtesy of cooperating governments, regulatory and legal regimes are being adjusted to deal with the peculiarities of knowledge products that are void of excludability, rivalry and transparency. Knowledge management firms help to revamp business organizations as ICT-rich environments with elements of "shared spaces for knowledge creation." Global mega-corporations have started to evolve from multi-national companies (MNC) with the goal of selling internationally the content developed at their centres, to global production networks (GPN) busy at international knowledge creation and diffusion. The combination of the culture industry, global market and cooperating governments assures mammoth global sales of all goods and services, with an increasing share of ICT and/or knowledge-related products. The ideology of the Knowledge Economy[53] is solidifying and assuming the position of a social and political icon – something that descends and stays without too many questions being asked.

This idea has also raised the interest of society at large, most immediately in the industrialized countries. It delivers in tangible and attractive terms. It reconfirms the belief in science and technology, as well as in the market, and in the ability of all three to satisfy the changing demands of consumers. To the extent to which market supplies fill the gaps in human capabilities, it also serves human development and adds to people's well-being. The notion that, at least partially, it may deliver according to the consumerist culture manufactured by the culture industry is by and large dismissed as a nuisance. If people embrace the consumerist culture, they own it and they feel good about it. Outside the

industrialized countries this idea has had a broad appeal too. It produces a powerful demonstration effect, at least for parts of local business communities that can afford transition to e-business and link with the global market, as well as for consumers all over the world. This may be an emerging global billboard society, but it fascinates and attracts.

The most vocal objections as a rule originate – sometimes for the wrong reasons – in circles with a history of repressing social progress or with a history of destructive actions. They distort the more sophisticated debate about the conflicting agendas for scientific research, about the investment priorities, about loss to society as a whole, including safety concerns. They enjoy little voice in the public arena.

> Another thought has been on the political side. It has been about the possibility of achieving greater participation from people in their institutional roles as citizens, labourers, consumers and even family members. No sweeping institutional changes have followed the formulation of this idea. We know though that such increased participation would be based on mass production of politically useful knowledge "to maintain developmental equilibrium"; on very broad dissemination of that knowledge among the people; and on its application to all kinds of decision making that impacts the way in which people live and work. The theoretical demand for it should be limitless. In most cases, institutional regulations that define relationships between elected officials and the electorate have been found ill equipped to produce public value in response to better, faster articulation by the citizens of their preferences. Labourers have found business organizations to have questionable value structures and to be ill-equipped to involve them in decision making. Consumers are faced with the power of mass media corporations that as a rule give preference to the culture industry and not to their concerns.

We are at the very beginning of registering the impact of increased people's participation via application of mass-produced knowledge. However, this idea remains as if in temporary suspension. The groups with narrow encompassing interest, by definition, cannot support it whole-heartedly. Democracies, at their current depth, defend the favourable (for them) status quo. From their point of view, if the ability to mass-produce knowledge were to enter the political arena, ideally, things should remain the same. It is noteworthy that in most political settings, save for some imaginative experiments in a number of Scandinavian countries, two relatively low impact applications of ICT in the political process prevail: e-mailing of elected officials and e-voting. E-transparency puts no special requirements on the quality or overall usefulness of the information provided. Only a handful of countries encourage or facilitate use of the Internet (e-participation) to voice opinions about governmental policies and budgets. None of them encourage or facilitate voicing opinions about the social outcomes of these policies, or (with very few exceptions) horizontal networking among the citizens. As a rule, the agenda for electronic consultations with the government is set by the government itself; the exchange is one-way only (not interactive); and attentiveness and responsiveness on the government side are not guaranteed.[54]

Society at large has a multitude of difficulties with practical application of the idea of increased political participation. Therefore, right now it remains essentially a promise that is still far removed from reality. The odds against the possibility of an individual impacting public policy making have always been very high; these odds remain alive in general perception and inform prevailing individual negative choices about becoming

politically active. There is little welfare support that would even out inequalities of status in the public sphere; these have been excluding in the "pre-knowledge" and continue to exclude in the "knowledge" age. The deliberative resources of the citizens are in very low supply. The digital divide is real.[55] In general, available rules and tools do not support mass production and utilization of politically useful knowledge. Using the Internet for mobilizing mass street demonstrations (the "smart mob" approach) has recently produced in Europe and the U.S., spectacular, unprecedented results. These have been by and large ignored in policy decision making – a lesson in the necessity of combining the mass production of knowledge that potentially can be politically useful with securing a strong voice in the public sphere (i.e. institutional transformation and change).

Objections to this idea are based on the misunderstanding that confronts representative democracy with direct democracy, as if plebiscites equalled mass production of the politically useful knowledge or the knowledge "to maintain developmental equilibrium" could not inform or be used by the representative democracy. And we should always remember that representative democracy was invented to circumvent the communication and transportation obstacles in the emerging democracies of the modern age. Its existence has been justified on this basis and subsequently, on the basis of the service to the people that it provides by allowing well-informed, well-paced deliberation of serious issues in the public interest. But it needs to reinvent the justification for its existence by offering something more or something else. ICT eliminates obstacles in communication and transportation. Judging by results in many a voting district, current deliberations seem ill informed and ill paced. Some talk about elected officials as future coordinators of the "shared spaces" for creation of the knowledge "to maintain developmental equilibrium." Whatever happens, deep institutional change seems unavoidable here.

> Still another thought has occurred on the side of public administration: the chance to improve the government by having it use ICT in its internal and external relations (e-government). Some have wanted it leaner and more efficient. Some have wanted it more effective and better in terms of the quality and outreach of services that it provides to the taxpayers (citizens and business firms). Some have wanted it more responsive to the needs of the citizens, as expressed by them. In this process it has become apparent that ICT alone, without change and transformation of government structures and modes of operation, and without change and transformation of developmental goals and patterns of activities can only digitally clone the existing (even if far from satisfactory) reality. Yet no extensive institutional change or transformation has ensued. This would have to result from the political process, which by and large has not yet reacted to the opportunities for human development opened up by the possibility of imaginative use of ICT by public administrations. For now, k-government, i.e. converting organizations within public administrations into (networked) "shared spaces for knowledge creation" gets little traction. As has been mentioned above, demand for utilization by public administrations of "new meaning" created within the political process by converting the citizenry into a "shared space" for mass-creation of knowledge "to maintain developmental equilibrium" is also limited.

The groups with narrow encompassing interests have embraced the idea of e-government mainly as an extension of the New Public Management policy. The promise of cost efficiency brought about by the use of ICT in operations of public administration as

well as the opportunity to increase the quality of pro-business services provided by public administrations (from issuing licenses and certificates to promoting foreign investment or tourism) have raised interest and assured funding. E-government has also become a product for private business firms (vendors). E-integrated financial management systems, e-procurement and e-taxation as well as a host of other business-enabling applications have been given priority.

The interest of the whole society is somewhat ambiguous, even in the industrialized countries that feature relatively high rates of people with access to the Internet. On one hand, technology-led change enjoys support. On the other, the digital divide ("access divide"), lack of trust in government, privacy concerns, cultural preferences, technical deficiencies of e-government applications and content that too rarely speaks to the real interest of the people decrease interest and discourage support. However, the field is starting to be filled with encouraging experiments. The multi-channel approach and Internet-to-traditional-media approach are examples of bridging the digital divide. More people are using the Internet to search and download public information. E-learning is starting to get popular support.

Objections are few and often border on indifference. They focus on high cost and the high failure rate of attempts to deploy e-government applications. They raise privacy concerns. They highlight the access divide that makes e-government inaccessible for almost all people in the South and for most of the poor people in the North and in this way, broadens the mainly income-based difference in distance between people and their government. They register that a government whose policy guards the current balance between the groups with narrow encompassing interest and the whole society needs profound transformation to start addressing the human development interests of the latter, both in analogue and in digital form.

Thus, currently, the ability to use ICT and mass-produce knowledge in the context of the market economy enjoys support from the most powerful social forces and little real opposition from anyone else. E-government may be put in the very distant second place, while e-participation is relegated to the even more distant and not at all assured third place.

A review of the on-going transformation of social institutions points to emergence of a society in which the mass production and mass utilization of knowledge in the context of the market economy would not encounter many obstacles. This builds the Knowledge Economy and currently very much defines the "transition to the Knowledge Society." However some fundamental questions remain:

Are the institutional changes introduced to create an environment conducive to the Knowledge Economy in which ideas are transformed into commercial value[56] generic enough to allow the whole society to perform as a "factory of new meaning" or too specific?

Are the current institutional changes that occur, mostly on the business side, creating enough room for limitless development of people and information throughout the whole society?

How will mass-development of knowledge in the context of the market economy impact human development and loss to society as a whole related to market operations?

How will it test the carrying capacity of people and the biosphere?

Question 8: As transition will be involved, how does a social transition work?

Society is like a huge jigsaw puzzle that continuously self-assembles.

Another way of expressing the same idea is to say that society shifts from an old order to a new order through a transitional phase of relative chaos, when old relationships have lost their usefulness and new relationships are emerging to eventually "lock in" and dominate the whole society.

Thought is the spiritus movens of this process.

People are capable of reflection and choice. Human history can be written as a history of people's struggle for the freedom to reflect (and express results of their reflection) and for the freedom to choose. When reflection tells people that there is a way to improve their well-being, they want the freedom of choice to make such a new opportunity part of their life experience. There are two sources of possible restraint for the freedom of choice: moral values and existing social institutions.

On the side of moral values, the two prevailing structures are those of utilitarianism, which allows anything that is advantageous and converts freedom into a license; and goodness, which allows anything that is compassionate and is compatible with human solidarity.

On the side of social institutions,[57] roles are negotiated, accepted, and locked in. Relationships that are based on these roles have been established. Day in and day out, by their behaviour and actions, if this behaviour and these actions correspond to their roles, people recreate their social institutions. They reproduce the social order that is based on these institutions and on the relationships among them. The way in which we exist (i.e. live and work) is determined by social institutions and the roles we play in them. Acceptance of this fact is necessary to preserve social order over long periods of time. Yet it is equally true that institutions depend on people. If people refuse to show up, institutions implode. If people change their behaviour, start to act "out of character," the institutions are transformed. In other words, by their behaviour and actions, people have the power to reproduce or transform the world in which they live.

A transformed institution more often than not has difficulty in maintaining with other institutions the same kind of relations it had before the transformation. Links weaken or disintegrate.

The transitional period (chaos) arrives.

Vested interests exert pressure on people not to change their behaviour within institutions, not to renegotiate their institutional roles. Also, other institutions exert pressure on the transforming institution not to go too far, not to break up the old web of inter-institutional links, not to undermine the old order. This pressure is oftentimes successful, and the old order is petrified: the policy choices that shape the future are made today, when those who have the most to lose are very influential.[58] But on other occasions, human will organizes into a social force with enough power to solidify the initial institutional transformation. New links within and between social institutions are being sought. This is made possible in a variety of ways: some old institutions may disappear; some new institutions can be built; but most often a series of transformations occurs in existing social institutions across the board. This requires negotiation/struggle to change the nature of the institutional roles that people play. Once this process is completed, accepted and locked in, a new web of inter-institutional relationships can be created and solidified.

A new order is in place.

[Until *(panta rhei)* somewhere, someone reflects on something new that is relevant to his or her well being and starts demanding the right to choose the incorporation of this new opportunity into his or her life experience.]

The above requires an expanded footnote.

Far-reaching institutional transitions always result in shifts in wealth and power. That is why we call them revolutions. However, throughout history, transition after transition, they have never eliminated the phenomenon of exclusion and marginalization. However they have often changed the composition of the excluded and marginalized groups as well as the reasons for their exclusion and marginalization. The historical optimists would argue that gradually those excluded and marginalized groups have become – at least relatively – smaller and/or that the basis for their exclusion or marginalization has become narrower. The historical pessimists would argue that exclusion persists and comes now in many misleading guises (e.g. human rights without the rule of law; elections without democracy; representation without a voice; women rights without the stability of a two-parent family or with a one-income household; employment without a job or a living wage, etc.). The way in which this will play out in transition to the advanced Knowledge Society will eventually depend on values, and especially on the value that this new human civilization may wish to place on human solidarity. It may also be influenced by the economic interest of engaging the whole available store of human creativity and tacit knowledge. By definition, the fully developed Knowledge Society cannot accommodate social exclusion and marginalization. This would result in weakening its very foundations.

Most often, governments are not at the cutting edge of change. They are the cornerstones of political, economic and social stability, which has many welcome features (e.g. protection of human rights and the rule of law, where they exist) as well as some not so welcome features (e.g. resistance to change, often violent). They tend to be embedded in the entrenched political, social, cultural and business groups with narrow encompassing interests.[59] Therefore they are more likely than not to join forces with the coalition that opposes change. Recently, new qualities are stressed by management experts as crucial for business leaders: visioning, intuition, understanding of the patterns of change and an ability to imaginatively act on this understanding. These can be recommended outside the business circle too. In the best of scenarios, a government would meet the swelling social force and accommodate the institutional shift by using the instruments of public power in a supportive way (or by preventing their use in defence of the status quo). This would be possible provided that the narrow encompassing interest would broaden and evolve into a super-encompassing interest that works for all.

Finally, history teaches that the societies to which wealth and power gravitate as a result of a transition are less those that, in response to a challenge, over a long stretch of time painstakingly build the enabling governance systems and institutions, but rather, those that by historical accident are as if ready-made for the coming wave of change. A thought, embraced by a social force, is still needed to make demands on the existing institutions. But in relative terms, the necessary restructuring of relations within and between institutions is less taxing, more natural and much quicker than in other social environments. Arguably, the societies in Flanders and England in the 17th century were well positioned to embrace market economics. Today, mass production and mass utilization of knowledge will be finding their natural homes more in some societies than in others. Those societies, as well as the group of effective early reformers, will lead the world in the 21st century and beyond. And while societies can do nothing about the history that has shaped them, by their wise policy choices they can strive to be the effective early reformers.

Important points emerge from the above presentation and analysis of pieces of the mosaic called transition. Perhaps none of them is more important than the one about thought as the origin of change. Thoughts cannot be controlled or suppressed (at least not for long) and in the course of history they have always prevailed, even if it has taken an unjustifiably long time. So when we speak about people and information that can develop without limits, or about the capacity of society as a whole to enter the mode of a "factory for mass development of knowledge," we have to understand that until these potentials are fully realized, there will always exist a bothersome gap between the reality as it develops and the feasible ideal. This gap will be filled with thoughts about change and with struggle for the freedom to make change happen. We already see the elements of chaos and institutional tension around us. They test the flexibility of the existing institutional setting to accommodate the new developmental opportunities brought by the ability to mass-produce knowledge. If the test turns out negative results, institutional transformation will be required. The cost to the society will depend on whether such change is resisted or accommodated in a thoughtful way.

From history, we know how exorbitant the cost of resistance to change can be. Paying it cannot be in the interest of society as a whole. Accommodation does not come by itself though. It requires shared understanding of the pattern of change, rethinking the encompassing interest that controls public power in a democracy and an open political process that also takes into consideration appropriate values.

Depending on the choices we make, we can obtain a:

Nominal Knowledge Society – a surprisingly frequent phenomenon these days. Government strategies and policies proclaim the desire to achieve the goal of the Knowledge Society but none of the programmes in place or envisioned contain believable plans that would measure up to the task of the needed institutional transformation. None or only very little of the potential brought by the ability to mass-produce knowledge is utilized. To the extent that it is, it is by accident rather than by design.

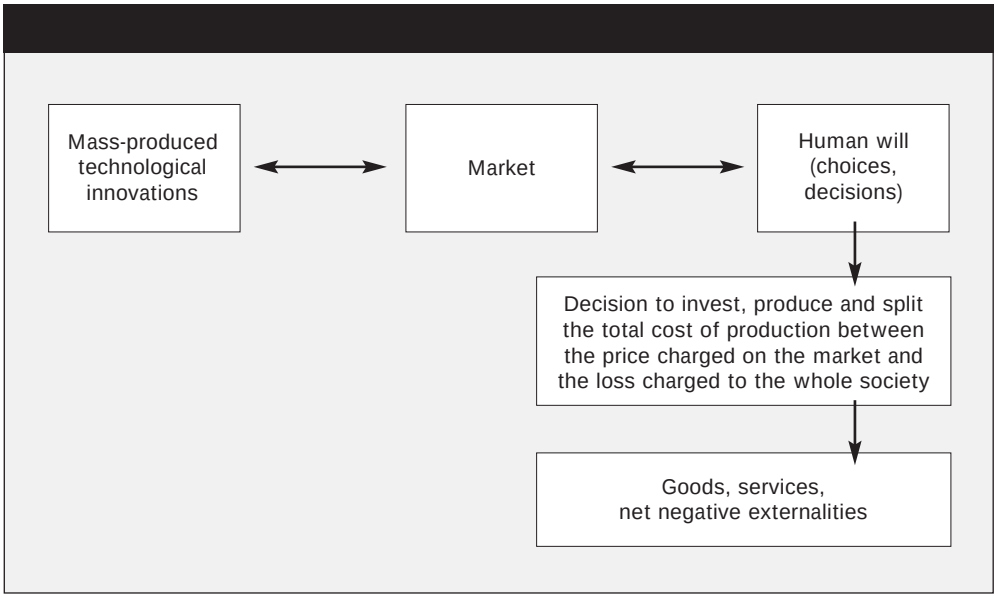
Warped Knowledge Society – where institutional transformations occur but are careful to stop before they disrupt the prevailing balance of power. These tend to focus on only a narrow spectrum of the application of mass-produced knowledge. If the current transformations in the industrialized countries were to stop at the level of building the Knowledge Economy, this is what would most likely obtain (see Graph 1). In this situation, part of the potential brought by the ability to mass-produce knowledge would remain underdeveloped and/or unutilized, contrary to the interest of the society as a whole. The tension around bringing the institutional transformation to its logical conclusion would remain, building chaos into the life of such a society. Remedies to that chaos cannot be found in the kinds of knowledge needed for development of the Knowledge Economy (e.g. technological innovations), but rather in other, underdeveloped or underutilized kinds of knowledge. Chances are that the Warped Knowledge Society would eventually self-destruct by moving to more advanced stages of institutional transformation;[60] or by producing an amount of loss to society as a whole beyond its own carrying capacity.

Smart Knowledge Society – where the pattern of change has been understood and acted upon. Institutional changes open broad avenues for limitless development of people and information and they re-build social organizations for mass production and mass utilization of knowledge. There is no systemic tension between thoughts about fuller utilization of the ability to mass-produce and mass-utilize knowledge and the existing institutions, as the latter remain in an adjustment-friendly posture. In a democracy, public power is locked in the super-encompassing interest that embraces the society as a whole. The market produces with no loss to society as a whole. Actions are in synch with values

and an open political process watches the fit among outcomes, values and actions. Human development and protection of the biosphere function as goals and means of development.

No one should expect the Smart Knowledge Society to become the prevailing way in which human society is organized in a predictably short time. However, it is worth the struggle for the freedom to make it happen.

Graph 1
Ecology of the emerging Knowledge Economy



Question 9: What institutional changes are required to secure the needed supply of tacit knowledge and creativity (people)?

Many a study of the subject leaves the reader with an impression that it all boils down to education and as far as education is concerned, to studying science, mathematics and engineering-related subjects.[61]

Of course, it is difficult to underestimate the role of education in the Knowledge Society in general,[62] but the challenge would be to provide not just schooling for a specific profession, but rather, schooling for a creative life and creativity in a specific profession. The "proper" mix of primary, secondary and tertiary education, as well as life-long learning,[63] deserves analysis that goes beyond the intent or scope of this Report. Suffice it to say that putting no cap on education and learning would be the best public policy.

Right now, statistics that count university graduates in science and engineering are popular as the proof of progress in social adjustment to the "Age of Knowledge." True, since the dawn of human civilization, when our ancestors picked up a stick or a rock and used it as a tool, we have entered the age of machines.[64] To build machines, an understanding of science and a mastery of engineering is needed. We have accumulated experience that teaches us that via technological innovations machines can embody countless amounts of "new meaning" and have positive impact on productivity. Therefore, in a society focused on being economically productive, on using productivity to accumulate material wealth, production of machines – ergo supply of people with education, competencies and tacit knowledge that allow them to be masters of machine building – looks like a winning formula for overall social progress. This also locates knowledge development in very specific places: research and manufacturing facilities capable of turning out machines.

Naturally, the Knowledge Society will continue to need machines. But much is changing around this need. As has been mentioned, the intangible is moving to centre stage (e.g. shifting from "how to build a machine?" to "if to build it?," "for what purpose?" and "how to safely integrate it with society?"). And with growing capacities to mass-produce knowledge across society; with the growth of C2X; and with seeing the whole of social life as a factory of new meaning, the perceived exclusivity of R&D facilities and organizations capable of producing fixed capital as the dominant locus for knowledge development can and should be re-examined. Knowledge Societies would continue to need highly competent specialists in natural sciences, as well as engineers. They would also need vast amounts of tacit knowledge and creativity that could be applied in this and many other areas of human activity.

The notion of human life in its fullness…

Thus, seen as a pure model, the Knowledge Society needs a limitless number of people to act as carriers of creativity and tacit knowledge. Quite obviously, this statement needs careful qualification.

Most likely, the Knowledge Society would bundle together the biologically and morally grounded right to life with the right to a creative and productive life. This would offer a mature understanding of the need for protection of human life in its fullness. A new perspective on population growth would also result, with procreation viewed as a specifically defined, long-lasting commitment and obligation for the procreators and the society that encourages procreation, this time for a new reason: not just to populate the planet, but to supply a vital asset for the Knowledge Society.

No philosophical systems, including the major world religions, support life that is started and then wasted. We can of course usefully continue to discuss in this context what is creative and productive and what is wasteful, and no doubt opinions will continue to differ. However, if we tie this discussion to an understanding of the goal of our development activities, and determine that this goal is high quality and safety of human life, a definition of a "full life" should become possible. It would recognize the need for providing an opportunity for each person to live out fully his/her creative potential and to employ this potential in productive practical behaviour that builds up high quality and safety of life for all.

Who should (and how to) provide such opportunities are matters of ideological and political debate. Some ideological trends would stress the rule of law that protects human rights and freedoms and then leaves it to the individual to pursue his/her individual development. However, if everyone living an optimally full life becomes a matter of interest to the whole society, this equation would have to change dramatically. This might include a useful shift from thinking and talking about a "social safety net" to thinking and

talking about a "springboard for people's unlimited development." These are two very different images, two very different approaches to human development. Only the latter fits a society that counts people among its most precious assets.

Nurturing and developing human life…

New life would have to be captured in a nurturing institutional environment.

If – as is most likely – the family continues to provide the support structure for initially providing human life with a nurturing environment, then it will have to be a functional family. From both moral and social organization standpoints, a balance between income earning and child rearing will be needed. In many important dimensions (e.g. nutrition, health care, shelter, income), should a gap in the strength of the family exist, it would have to be filled by the society.

In the long run, over the span of human life, societies would have to revisit the whole institutional set-up for human development and look at it from a totally different vantage point, that of the needs of the Knowledge Society. If human capabilities are the opposite of human "un-freedoms," an institutional setting that reproduces insufficient health care and education and allows poverty, unemployment, personal insecurity, obstacles to genuine participation, gender inequality or a degenerating natural environment would have to be revamped.[65]

The concept of human development is crucial to any discussion of the Knowledge Society as human poverty and a generally low level of human capabilities do not add up to a supply of developed people. The feeling that one is "like garbage that everyone wants to get rid of" (see Box 9) is not likely to provide the positive social feedback or nurturing cultural environment in which creativity thrives. To be sure, poor people and people living at the edge of survival are as creative as we all are and the fluid situation around them sharpens their creativity: it allows them to survive on meagre material resources by making the most of these resources. But this is a one-track creativity, detached from most information-sharing loops and put in the context of vastly underdeveloped tacit knowledge.

Culture, legal framework and distribution of resources – and this includes general rules for distribution of wealth in a society as well as the particular case of distribution of public[66] resources – are at the core of the debate about broadening the range of and access to developmental opportunities for all people everywhere.

Culture – important as it is – is rarely discussed in the context of human development. Important parts of it are not codified at all. Parts are codified inter alia in universal conventions on human rights and freedoms, a negotiated platform for civilized life. Many of these conventions enjoy less than universal acceptance and even narrower practical application. However, the world has learned to live with this imperfection and widely diverse national regimes for enforcement (or, as the case may be, suppression) of human rights and freedoms exist side by side in the world of political and commercial alliances. Some countries and civil society organizations act as self-appointed watchdogs here. However, except for situations where lack of compliance offers in global politics a useful tool for temporary political pressure, by and large this universal issue is being played out locally, behind the tightly shut doors of sovereign states.

The right to equality before the law, upheld by the rule of law in developed democracies, represents a milestone at which – for many – the discussion about human equality stops. Any attempt to go a step further ignites the bitter debate on freedom *vs.* equality.[67] One would hope that after the costly ideological wars of the 20th century we could now hold a more intelligent and less emotional discussion about this issue.

As it stands today though, this discussion is artificial. It operates at the level of *clichés* and labels. It adds nothing to constructively impact the issue at hand, inasmuch as this

debate has an extreme built-in bias that makes it about outcomes. Allegedly, while freedom resides on the side of inequality of outcomes, the equality of outcomes can only be achieved via totalitarian tyranny. Therefore, the choice being offered in this debate is between freedom at the price of inequality on one hand and equality at the price of tyranny on the other. It is refreshing to realize that this is a false choice of alternatives and that perfect equality of outcomes is not part of anyone's agenda: it is a hypothesis constructed by one side in the debate for the sake of making an argument. The Report espouses the belief that the social institution of democracy, not totalitarian tyranny, will serve the Knowledge Society well. Yet if one follows the logic of the above-presented "freedom – equality" debate, in a society that for its development would require a redistribution of resources to build up the capabilities of all people everywhere (i.e. as per limitless development of people), democracy would be threatened and eventually eliminated. Totalitarian tyranny would become a preferred choice for social organization of the Knowledge Society. Or human development and the development of the Knowledge Society would have to be put on hold or in slow motion in anticipation of the net positive externalities produced by the global market, if any. Such reasoning would assume also that human will would blindly and stubbornly remain forever set on protection of personal gain defined as economic gain.[68] That is why tyranny is invoked to "forcefully take away." The option of rethinking personal interest and freely accepting the value of human solidarity – therefore the option of being comfortable within a changed pattern of wealth distribution – is discarded as unfathomable (as if free people were designed as selfish people and selfishness were the equivalent of greed).[69] Being selfish is an art. Being selfish in a smart way (i.e. by seeing one's personal interest tied to the personal interest of others) may be the highest form of that art.[70]

Taking into consideration the above, one can still usefully talk about three related issues: management of personal risk; general rules for the distribution of wealth in a society; and management of public resources.

Management of personal risk:

Where traditional customs, values and institutions prevail (e.g. extended family or tribe), societies tend to be rural and resources tend to be on the low side. On occasion, in many a traditional community, the level of resources becomes so low that the whole community requires the intervention of a broader risk management mechanism. Where the central government is unwilling or unable to step in, arguably not often enough or quickly enough, international relief assistance does.

For a while, on the "higher-income" side, for those who found themselves without income or whose income was not high enough to privately purchase an individual risk management system, urbanization and industrialization came up with a new risk management mechanism: the welfare state. This was instituted in response to a huge social crisis in the industrialized market democracies, and to a very tangible ideological and political challenge. Now, in the industrialized North, this too is on the decline and tends to vanish everywhere as a result of choices and decisions that are being justified by the "competitive pressures" of the global market. Societies or segments of societies that are only now moving from mainly rural to urban environments and from an agricultural to an industrial source of work and income find out immediately, "on entry," that the management of risk for the most part has been privatized for them. "Leapfrogging" from an agricultural society to a Nominal or Warped Knowledge Society would not change this predicament either. And the promise of "higher income" is disappearing for many. Full employment remains an illusive goal (this means no income, except for unemployment benefits, limited in time where they exist) and even the living wage for all employees finds less and less acceptance (this means income below the poverty line).[71]

Be that as it may, eventually individual risk must be managed. It is not enough to break up the traditional risk management system, put the responsibility on the individual, call this freedom and move on. Human rights and freedoms that are not supported by human capabilities are too easily converted into the human right and freedom to be hungry and insecure. The road from this point, for some, leads to a lifetime of poverty and depravation; for others, at the extreme end, to a life inside virtual urban warfare. In either case the society fails to maximize supply of one of the main assets of the Knowledge Society: developed people. The time may have come for societies to understand that the great historical achievement of enshrining human rights and freedoms into laws does not represent the whole story of human progress. This progress is complete only if the other part – that of human capabilities – is also in place.

Historically, a society that has made the decision to become active in the area of management of personal risk has done so by turning to various forms of the welfare state. This continues to remain a valid option for many.[72] We now have the right to be thinking about a welfare state that is much better managed and focused thanks inter alia to the use of ICT in public administration (e-government) and knowledge, especially the knowledge "to maintain developmental equilibrium" in policy making. Importantly, elements of the welfare state that were formerly lacking for the most part would make this U-turn easier, e.g. transparency that informs creation of the knowledge "to maintain developmental equilibrium," feeding that knowledge into genuine participation, and in this way, holding those who manage the welfare state accountable.

A little recognized fact is that a welfare state not only subsidizes the risk management system of the poor but also positively affects the "bottom line" of business firms. It allows them to create loss to society as a whole by putting on the market, offers of jobs that pay below the poverty line. Social services and benefits funded from public revenues settle the bill issued to society by businesses that engage in such behaviour. They also insure against the threat that, in time, accumulation of the loss to society as a whole would disrupt the market operation via social unrest.

A more direct route would be to change the behaviour of owners and managers of business firms in the marketplace. Offers of jobs that pay below the realistic poverty line and offer no benefits to the workers can be taken off the table. Firms can adjust their business models to make it happen.[73] Then, the only question remaining would be who would absorb the cost of such adjustments: owners of business firms or consumers. "Market" would have nothing to do with such decisions. Both sides of the balance sheet would be equal, whatever solution were adopted.

So, in reality, we have more than one option that a society can look at while trying to subsidize individual risk management systems. We also have at least four models for paying the cost of such subsidies: taxpayers, owners of private business firms, consumers, or any mix of the three. [When no one pays, the "fifth" model – loss to society as a whole – does not go away. The disadvantaged people, who on the strength of their own resources cannot raise the level of their capabilities, can quietly suffer or muster their anger and courage. We all pay then, in terms of human misery and lost human development opportunities or in the currency of social tension and chaos.]

Support for subsidizing individual risk management systems via any of the above-described options can come from several sources. Groups with narrow encompassing interests can absorb an understanding of the requirements of the Knowledge Society and decide to act responsibly. A new understanding of the human intent in life can be built up by mass production and mass utilization of the knowledge "to be" and to "co-exist," specifically by adoption of a unifying central cultural thought for humanity (see below).

And last but not least, the voice of the citizenry can be made to count. This decision goes to the core of the nature of future societies and would shape like no other the "liveable" states, homes of the Smart Knowledge Societies.

Wealth distribution:

Patterns of the distribution of wealth in society have evolved historically. They have always been and continue to be determined by culture and social institutions. There is little basis for thinking that this evolution will stop here and now, or that humanity has achieved the optimum pattern of wealth distribution that needs never to change.[74] The future direction of wealth distribution would be instrumental in deciding whether a society would bother with subsidizing individual risk management systems, and if so, who would be paying for it.

From the economic perspective, patterns of wealth distribution have always been about finding in a society and an economy a balance between satisfying concerns about (1) income and distribution; and (2) economic incentives, or more precisely, finding a "tolerable" minimum (or attainable "maximum") on either side.[75] This cannot be mathematically established. It is a matter of well-informed choice. As such it is also a matter for culture, ideology and politics.

These days, wealth seems valued mainly as a gateway to personal freedom and personal security in a situation where, with the continued imperfections of political systems and progressing erosion of the welfare state, taking care of personal freedom and personal security is in large part privatized. Wealth is also valued as a symbol of society's recognition of the success of personal efforts and as a gateway to social prestige. [Accumulation of wealth and power for the pure joy of it belongs to psychiatric wards, of course.] But we witness accumulation of wealth without personal effort; "success" is always culturally defined and expression of social prestige can be many-faceted. The fact that those who, in recent history, have tried to tinker with patterns of wealth distribution have been clumsy should not close this subject forever. One can think about quite a multitude of solutions if one considers all the ways of securing personal freedom, personal security and personal recognition of success, or about culturally determined definitions of success, etc. And there is no need to just give up on the rule of law as the guarantor of rights and freedoms or on public administration as an efficient and effective provider of social services, or to forget small steps with big meaning.[76]

All this calls for a well-informed public debate.

Some want to cling to the milestone of human progress that demarcates the distance that humanity has covered to enshrine human equality in laws and do not want to move a step further. They also have a valid culturally, ideologically and politically legitimate position. As this position is being pronounced with great strength all over the world these days, it deserves due attention. Its proponents face the same challenge: to create an environment for the limitless development of people and information, and for the mass production and mass utilization of knowledge throughout the whole society, eo ipso, for making an effective transition to the Knowledge Society and building a liveable state that is home to it. They deserve equally attentive social scrutiny and well-informed public debate along the way. Here are some of the questions they face: Do they believe in the continued social usefulness of the value and practice of human solidarity? If so, how do they plan to reconstruct it in the modern world? How do they want to transit to the Knowledge Society without making resources available for taking care of the limitless development of all people everywhere?

A society without human solidarity and a Knowledge Society for only the chosen few are possible. But then the next questions arise: How can personal freedom be exer-

cised among people who are not free to enjoy life in its fullness? And how can the safety of life be secured in the sense that this Report treats it – as something that cannot be bought with money but, rather, must be negotiated by the local and global community as a whole? Wealth can buy a "shield" (e.g. "gated" communities). So, again, there is a choice to make: to build a "shield" or to transform social institutions, including those that regulate the distribution of wealth, in such a way that a "shield" is not needed. A word of caution here: the scrap yard of history is littered with broken shields.

Finally, the issue of public resources:

Here one can usefully focus on the issue of the encompassing interest in democracy and formulate a thesis that for development of the Knowledge Society it would be sufficient if a democratic government devoted itself to production of public value,[77] and nothing else.[78] As can be appreciated, no perfect equality of economic outcome is demanded here, no threat of totalitarian tyranny looms in the distance. We are safely in the framework of a free democratic state and the task revolves around one question: "How can the leakage of public value be plugged so that it does not flow out as private value captured by group(s) with an encompassing interest narrower than that of a society as a whole?"

The answer to this question can be found in the development of democracy: in firming up the link between the government and the ability of people to express their preferences, in the ability of the government to deliver public ends, and in the ability of the people to hold the government accountable. A democratic majority with super-encompassing interest would best underpin such an arrangement.

The price that the people would be ready to pay in terms of what they would have to give up in exchange for public value (e.g. taxes, freedoms, information, time) would depend on their well-informed consensus about the performance of the government. If the political system is free and open, it will be self-learning and self-correcting over time, and also in terms of the level of resources made available by the society for production by the government of public ends. This would not assure a perfect equality of outcome. Rather, it would constitute a re-direction of public resources towards assuring perfect equality of opportunity – a goal still elusive in democracies in the world today – and eventually lead to a much higher level of equality of outcome than prevails today.

Parenthetically, international transfer of public resources (grants, loans) would hinge on the possibility of adopting the goal of the global Knowledge Society and the development of an encompassing interest to match this goal. Then, such transfers would convert from grudgingly-wrested-out retributions to well-thought-through investments in our shared future. But even under such a scenario one could not avoid local concerns. As always, it would be the broadness of the local encompassing interest that would decide if the resources coming from outside the country would be used in the interest of all or of only a few. This, in turn, would hinge on the strength of genuine participation.

* * *

One last caveat on the side of nurturing human life concerns the institutions for managing conflicts. We are carrying from the past a cultural legacy that approves and on occasion glorifies confrontation with the use of violence. We approve of public spending that builds up the means of violence. We allow political leaders to amplify differences with the "others" and lead us along the path of ideological fundamentalism and radicalism that too often ends in taking human lives – in wars (soldiers and the infamous "collateral damage"), in social strife, in ethnic cleansing, in genocide, in acts of terrorism. For many

societies capital punishment is an accepted form of punishment. In some, "honour killing" is rewarded with high social recognition. In others, with the full backing of society, the fate of the newly-born baby girl or the widow is not at all secure. There is nothing natural or civilized in socially institutionalized killing. Humanity can do much better. All this is a matter of cultural and political choice.[79] These choices can be changed and the requirements of the Knowledge Society provide an additional argument for altering them. It is enough to think of human creativity and tacit knowledge slaughtered on both sides of the front lines of the 20th century, the most murderous yet.

Nurturing and developing creative potential…

An equally nurturing institutional environment would have to capture and preserve for a lifetime newly-born creative potential.

We all have it. It can be developed. People can cultivate themselves as creative beings by frequent engagement in free and unobstructed reflection, the journey into self to the depth of true understanding and back to expression and action. Societies can create a protective, nurturing space in which people can develop like this, in which thinking differently carries little or no risk and in which devoting time to creative thinking is socially acceptable and rewarded. This starts with, but goes beyond, the rule of law that protects freedom of speech or freedom of creative expression. It touches formal institutions and a myriad of informal ones. It is about the quality of the social fabric that connects us all.

In the majority of cases, creativity develops in response to positive feedback from society every time we look at things and see them differently from everybody else and every time we leave the routine thinking valleys. This positive feedback can include social recognition, which builds up the human dignity of creativity and participation. It can also include material rewards.[80] Some individuals with particularly strong motivation are known to have developed their creativity in spite of negative social feedback. Generally however, families, schools, communities and places of worship or work that provide a protective, nurturing space for human creativity produce "new meaning" more easily than those that do not. This again is mainly a cultural phenomenon tied to notions of prestige and power. Finally, creative thinking is also a habit or skill that can be imparted. From this point of view, school enrolment ratios are important but tell a very incomplete story if the methods of teaching are not known or are suspected of suppressing individual creative approaches.

Valuation of diversity,[81] even in its extreme as a building block of a creative society, also has to be mentioned. As discussed below, it is best achieved in societies that share a common goal, vision and set of social standards. It is much more than tolerance. Tolerance sets the rules and allows for exceptional waivers. Valuation of diversity accepts, respects, values and merges the rules of the "diverse others." This concerns age and gender-related, racial, ethnic, religious, cultural, sexual orientation-related and all other diversities. Some people who by prevailing community standards have been considered mentally unstable are known to have been their community's most creative members. Exclusion of some always carries the risk of excluding the most creative ones.[82]

Nothing deserves special mention more than the intolerance and exclusion that leads to gender inequality. It is strong in all societies in the world but there is nothing "natural" about it. It has historical and cultural roots. It results from social roles that have been negotiated on the basis of a reality that prevailed centuries ago. The renegotiation is not easy as one of the results of those former negotiations is the imbalance of power between the genders and a keen interest of the more powerful gender to preserve that imbalance. However, a Knowledge Society that would exclude its own access to the creative potential

and very specifically formulated tacit knowledge of half of humanity would be exactly that: half a Knowledge Society.

Nurturing and developing tacit knowledge…

Finally, it is also about the quality of tacit knowledge that people carry. It accumulates as a result of mind/body experiences, has its own dynamic and most of it is difficult if not impossible to plan or administer. After all, such experiences in part result from the creative process, the human ability to perceive and record reality in a unique way. We all have it. Day after day, life occurrence after life occurrence, private reflection on such experiences after private reflection – we build it up.

Three caveats are important here.

The human right to privacy assumes a new role and new meaning in the Knowledge Society. While it will be discussed in more detail below, it is important to stress the existence of links among privacy, creativity and the development of tacit knowledge. It is in private that people can reflect most usefully on their experiences and on the experiences of others. It is in private that for various cultural reasons people feel safe to experiment with that reflection, test ideas and come to lasting conclusions. It is in private that people play out their most personal emotions and relationships. Privacy is important for creativity and for building up the reservoir of tacit knowledge. Therefore, it must be in the interest of the Knowledge Society to carefully treat and protect the human right to privacy.

The quality of our tacit knowledge allows us to operate at different levels of need. Specifically, a low intensity and narrow spectrum of experiences builds a correspondingly low and narrow ability to reflect on new information, process it and contribute to the creation of "new meaning." We all have tacit knowledge pegged to a somewhat limited number of life experiences. Therefore, it must be in the interest of the Knowledge Society to raise the intensity and broaden the spectrum of people's life experiences.

To this end, it should be remembered that tacit knowledge builds as a result of reflection on our own experiences and on the experiences of others. Learning, better yet – life-long learning – comes in here as an indispensable device. Literacy, learning skills, basic and higher education, open and affordable access to sources of diversified, quality information allow people to absorb and process the accumulated and recorded experiences of others. This way human experience transcends time and space. Therefore, it must be in the interest of the Knowledge Society to equip people for learning.

Box 9

Voices of the poor people

"Every day I am afraid of the next."

"Poverty is like living in jail, living under bondage, waiting to be free."

"People place their hopes in God, since the government is no longer involved in such matters."

"We keep hearing about monies that the government allocates for projects, and nothing happens on the ground."

"For a poor person everything is terrible – illness, humiliation, shame. We are cripples; we are afraid of everything; we depend on everyone. No one needs us. We are like garbage that everyone wants to get rid of."

"When one is poor, she has no say in public, she feels inferior. She has no food, so there is famine in her house; no clothing, and no progress in her family."

"The municipal Congressmen are all thieves … they do not solve anything, there are no schools, no health care. They do not vote [on] issues that interest the people."

"Those who have power and money will always win."

"Lack of work worries me. My children were hungry and I told them the rice was cooking, until they fell asleep from hunger."

"Life in the area is so precarious that the youth and every able person have to migrate to the towns or join the army at the war front in order to escape the hazards of hunger escalating over here."

"No one helps, not anyone. I would gladly help someone, but how when I am in need of help myself? This is misery. Our souls, our psyches are dead."

"If parents do not meet these payments, which are as high as Rs. 40 to 50 per month, the teachers were reported to beat the student or submit a failing grade for her/him."

"Problems have affected our relationship. The day my husband brings in money we are all right together. The day he stays at home (out of work) we are fighting constantly."

"The waste brings (…) bugs; here we have cockroaches, spiders and even snakes and scorpions."

"The children keep playing in the sewage."

Source: World Bank, accessed at http://www.worldbank.org/poverty/voices/listen-findings.htm#1.

Box 10

Hunger and human intelligence

"(…) more and better food helps brain grow and develop.

(…) Three centuries ago, chronic malnutrition was more or less universal. Now, it is extremely rare in rich countries. (…) The UN Food and Agriculture Organization estimates that 17% of people in the developing world were undernourished in 1999-2001 (…). The absolute number of undernourished people rose slightly over this period (…) from 780m to 798m. (…)

(…) Inadequate nutrition of mothers and young children alone is responsible for 9.5% of the global burden of disease. (…) by some estimates, more than half of the 10m annual deaths of young children are directly or indirectly attributable to malnutrition. (…)

Obviously, what hungry people need first and foremost is more food. But they also need better food. (…) Nearly 2 billion people consume less [iodine] than they should – usually because the water and soils where they live lack it. (…) The most important effect [of iodine deficiency] is on the brain, which cannot develop properly (…). Each year, says the UN, some 20m children are born mentally impaired because their mothers did not consume enough iodine. The worst affected suffer cretinism, the symptoms of which include severe mental retardation and physical stunting. Iron deficiency, meanwhile, is the most common nutritional deficiency in the world, affecting 4.5 billion people. Symptoms of deficiency include fatigue, shortness of breath and lethargy. (…) Worse, perhaps, is that iron deficiency impedes cognitive development. Some 40-60% of children in developing countries are impaired in this way. (…) iron-deficient children are retarded by the equivalent of five to ten IQ points. (…) vitamin A deficiencies compromise the immune systems of those under five in poor countries – increasing their susceptibility to infectious diseases, and ultimately causing 1m infants to die every year. Deficits also cause hundreds of thousands of children to go blind each year. (…) insufficient zinc appears to be linked to higher risk of dwarfism, diarrhea and pneumonia.

(…) Western experts tend to tiptoe around the issue of how malnutrition makes people less intelligent, but local experts sometimes do not. (…) Sam Chimwaza, an analyst for Malawi's Famine Early Warning Systems Network, says that reasoning ability of people in rural areas has been affected by malnutrition and it is hard for them to execute simple instructions. "They can work as servants in the city for two or three years and still not figure out how to adjust the temperature on the iron," he says. (…)

Sadly, the battle against hunger is harder to win than it should be. Food shortages tend to occur in countries with callous, despotic rulers. (…) Democracy and freedom of speech are attractive (…) of themselves. But (…) no democratic country with a free press, no matter how poor it may be, has ever suffered famine. Unfettered reporters provide early warning, and accountable governments know they have to respond to emergencies."

Source: "Nutrition. Food for thought," *The Economist*, 31 July 2004.

Question 10: What institutional changes are required to secure the needed supply of information?

The new age fascinates us with its increase in access to information. Objectively, it is unprecedented. In every category – books and articles published, radio and TV programmes broadcast, films produced and screened, telephone calls connected and perhaps especially on the World Wide Web – information is more plentiful and for many, easier to access than ever. Complaints that we have been flooded by too much information have started to come in.

Yet, can there be anything like too much information? Not in the Knowledge Society. Information is the raw material for knowledge development. It helps build up our tacit knowledge. It triggers tacit knowledge for creative reflection. The opposite is true. The Knowledge Society needs and lives by uninhibited access to all the information there is, and its demand for information will never have limits.

Also, democracy – the preferred system for political organization of the Knowledge Society – cannot exist without an informed public. If we look at society as a whole as one big factory for the production of "new meaning," and at the electorate as a shared space for the creation of politically useful knowledge, withholding information is tantamount to building an "ill-informed" consent, something a democracy cannot uphold for a long period of time. With appropriate institutional changes, Knowledge Societies can become highly developed democratic societies. Information would be their bedrock.

Two questions immediately arise:

What is the body of all the information there is?

How can we cope with the overabundance of information? (In its un-/mismanaged extreme, it can effectively play the role of a barrier to the access of information.)

All the information there is…

For years, the discussion about information has been built around the question: "How much to release?" This has reflected the ownership of and power structures surrounding information. Yet there is also a different way of looking at this issue. It can be reflected by a question: "How little to curb (withhold)?" This would reflect the conviction that, apart from culturally negotiated space that protects privacy, the rest of information belongs to everyone and only very exceptionally can be withheld from the public at large. According to this point of view, "all the information there is" would be like a huge block of granite sitting in the public square, visible and accessible by all, and only in the most extraordinary cases could parts of this bloc be chipped away and given for stewardship to a subset of us all.[83]

Indeed, on closer examination, with due respect for privacy, all the rest of information can be successfully claimed by us all. Information is basic for learning. In a very broad sense, it carries the understanding of the universe and of the nature and existence of people. As such it belongs to all people and should be available to them all. For instance, all the findings of the natural and social sciences fall into this category. Information produced by or within public institutions is by definition public. And it is the State that incorporates private business firms. Private investors only support them with their capital. A basis exists therefore to rethink the "socially responsible" behaviour of private business, including public access to information produced by and within private companies.

Thus, a solid basis exists for thinking in a very minimalist way about the "chunks" of the block that legitimately can be chipped away and given for stewardship to a subset of us all. What would be reasons important enough to do this?

The private "chip"…

Privacy is a human right recognized by the Universal Declaration of Human Rights.[84] Surely, it means different things in different social settings. Members of a small, remote community with close social or religious links have a different private space around them than big city dwellers. But all societies recognize its value and allow their members to negotiate a line that separates their private and public lives. Within the negotiated space, private information about themselves belongs to the individuals and only they have the right to release it. Yet the tension around privacy has become unprecedented these days.[85] The claim on private information comes not from the society as a whole, but from two distinct subsets of the society: business and public administration. It is important to recognize this fully. We are not talking about individuals returning their private information to the granite block of "all information there is" in the public square, but rather about the disowning of individuals of their right to privacy by two interest groups with, on occasion, a questionable record of serving the public and protecting individual interests. Businesses and markets are not set up to provide this protection. Governments are, but they need an elaborate political process to keep them faithful to this obligation. If that process fails, as it often does, there are no guarantees against flagrant abuse of individual interests by the public administration.

Yet, in the name of perfect operation of the market, business claims the right to know. In the name of better administration of public affairs, especially when there are security threats (real or artificial), the government claims the obligation to know. And modern ICT allows gathering, sorting and transmitting unprecedented amounts of personally identifiable data. It makes secondary use of such information – by government and by business alike – really easy. As business and government can collude in their quest (and government can always subpoena the personally identifiable data held by business), in many societies individuals witness a gradual erosion of their private space. If this trend is not reversed, chances are that the initial collection of individually identifiable data will weaken the position and change the behaviour of individuals in their negotiations with the government and with business about the breadth of private space. This would mean an erosion of human rights. And, importantly, in the context of our analysis this would narrow the space for creativity and the development of tacit knowledge.

The public administration "chip"…

The relationship between governments and citizens about the right to information generated within and by public administrations, while using public money, remains uneasy. The severity of the problem has been recognized in many societies as important enough to be regulated by law. Various Public Information Acts[86] constitute a reflection of this situation. Yet no satisfactory answer exists about how to keep this kind of information a part of the granite block in the public square.[87]

Political cultures differ. In some, the public expects and accepts governments to rule in relative secrecy. In others, the public trusts the government and does not mind it. In yet others, the level of mistrust of the authority of the government is very clearly pronounced. However, in all cultures lack of government transparency opens the door to rent-seeking behaviour on the part of public officials and civil servants; makes it more difficult to correct policy blunders, as well as administrative inefficiency and ineffectiveness; and creates opportunities for hijacking of the government by groups with narrow encompassing interests. One can even say that the reluctance of a government to become transparent is in direct relation to that government's focus on private rather than public agendas. All these aberrations are known to have happened even in countries with the most advanced democratic systems. This is bad enough from the point of view of keeping the government

as the hired agent for public value creation. In the context of our analysis, it curtails the ability of the electorate to develop politically applicable "new meaning" and undermines democracy.

A related though less discussed issue is the fate of knowledge with possible technical or commercial application that is produced within and by governments. Public administrations generate huge amounts of data and information. Public bureaucracies come up with sizeable amounts of new meaning. Public budgets finance research in all walks of life, including basic research in natural sciences, through public and private research organizations. Some of the information generated is never harvested or released to the public. Some, especially that which has commercial value, is privatized via direct transfer of property rights, sometimes to the business allies of the public administration. Again, this is bad enough from the point of view of keeping the government as a hired agent for the production of public value. In the context of our analysis it must be mentioned as a practice that hampers creation of new meaning across the whole society.[88]

The private business "chip"…

Historically, private business has negotiated and often enshrined in law a very advanced degree of lack of transparency. While much of this can be justified by a healthy attempt to keep the government out of private business, and by the rules of free competition, evidence suggests that the public is being short-changed by the licence that the State gives on its behalf to business, allowing it to operate in this manner.[89] High ideological walls have been built around this status quo. The tendency to retain secrecy is pushed so far as, on occasion, to allow undermining of the functions of the very institutions of the market economy, e.g. the stock exchanges. But the issue is broader than the prevention of criminal behaviour. The issue is about the right of the public to know, debate and in some way agree to the policies of business firms. This becomes crucial in the world of business mega-corporations. Their research agendas, product development and deployment plans, investments plans, product safety research and reports, etc. have a profound impact on human development and the state of the biosphere the world over. Rarely do we witness a public debate about them and when it happens, as a rule it is because the issue becomes important to another (rival?) interest group. Recently, such has been the case with stem cell research and genetically modified food. But in a vast majority of cases, people are not made aware either of the issues or of their impact. This goes beyond the political issue of the socially responsible behaviour of business. It dries out information crucial to a key type of knowledge needed to maintain developmental equilibrium in the world (see below).

The literature on Intellectual Property Rights (IPR) regimes is as vast as interests and points of view in this area. Those who equate the Knowledge Society with the knowledge-powered economy advocate very strict IPR regimes. They claim that the success of a society as a Knowledge Society would eventually depend solely on the quality of its IPR regime and the support of it by law enforcement. Others see more flexible models.[90] And digital products are proving difficult to control under any regime. There is little doubt that as long as the economy is driven by individual material gain (a.k.a. greed), removing or decreasing this would undercut some (a lot) of the motivation to create new meaning that can be converted into saleable products and services. Alternative models that would put an individual's pride and joy of leading a creative life behind the invisible hand of the market do not exist and most likely would require alternative models for wealth distribution in a society – an area in which experimentation does not have an encouraging historical record. Be this as it may, right now the patent law balances the interest of the creators with that of the public at large. When mass production of knowledge becomes possible, the public interest must be carefully considered and possibly reassessed. There is a trade-

off between providing enough protection for a few creators of intellectual products or owners of the rights to the content that they have produced and providing enough information to release the creative potential of many.[91]

Getting "all the information there is" right…

Finally, the issue of information management, the thought that there cannot be too much information in a Knowledge Society, is true but incomplete. People need information that is authoritative, truthful and provided when needed, where needed and to whom needed in the required quantity and in the most usable form (e.g. by subject matter or inquiry, not by source). We are still very far from such a state of affairs. Governments can certify the truthfulness of the information they provide and package it by outcomes of government activity, not by sources of origin in their bureaucratic structures. But they do not do this yet. In the markets, competition should work out appropriate models, provided that demand appears for truth and customized preparation of information.[92]

A separate problem is posed by the news media in the world. It is quite sobering to realize how few among the world's population live in countries in which the operation of the press can be considered as "free" A separate and vastly under-reported issue is what the press does with the freedom that it does have.

Nowadays, news media tend to be managed by private business firms for profit or by governments for political convenience. True public ownership of news media is not significant. Additionally, in parts of the world that dominate the production of broadcast news, news outlets, especially cable TV – though traditional press is not far behind – are owned by business conglomerates with vast and diverse interests that on occasion are in conflict with the delivery of news. These interests and their mediation via sensitivity of the conglomerate's interest *vis-à-vis* the sources of political or economic power have an impact on what is reported and how it is reported. Evidence abounds that as a result, the complete spectrum of exiting reality is not covered by the media, but only the part of that spectrum that is commercially viable, politically acceptable or ideologically "correct." This is self-censorship by omission. This already plays havoc with current social and political situations and does not promise that the needs of the Knowledge Society will be well served. As has been mentioned above, the Knowledge Society cannot function without democracy and democracy cannot function without a well-informed public. Freedom and freedom of the press are inseparable twins. The basic role of the media to oppose arbitrary power by speaking the truth cannot be compromised in a democratic society without that society having to pay a heavy price. Will news media play the role of supplier of information needed for the production of all kinds of knowledge in the future? If so, ways have to be found for them to provide, on a continuous basis, information needed by people to remain free; information about the patterns of human development in all parts of the world; and information about the progress of natural science. This would constitute the foundation of a society whose members can usefully reflect on self, the universe, others and social institutions that guarantee prosperity, peace and justice.

Thus, very much as in the case of human development, information development depends on the encompassing interest that prevails in a democracy. If today we see in the public square a granite block of all the information there is with large chunks of it chipped away, this cannot be in the interest of the society as a whole. It impedes mass production of knowledge. Again, development of democracy seems to be the panacea: a group with a narrow encompassing interest would not bother to organize the supply and management of information that serves the public interest of mass production and mass utilization of all kinds of knowledge in all walks of life; it might even find it contrary to its own well-being. A broad majority with public power locked in a super-encompassing interest would.

Question 11: What institutional changes are required to secure the needed supply of factories of new meaning?

The change, when it comes, will be more about social institutions and culture than about formal organizations and structures.[93]

In the Report, the term "factories" of new meaning has been chosen, as indeed a space for knowledge development processes information and turns out "new meaning" very much as a factory does raw material: what leaves the factory or the space for knowledge development does not resemble what has entered, at least in terms of form, usability and applicability. It would be pointless though to look for material symbols of the Knowledge Society as easily recognizable as red brick buildings and smoke rising from tall chimneys – the symbols of 19th century industry that reassuringly dotted the landscape. Universities and R&D laboratories; parliament buildings and newspapers; books, radio and TV broadcasts; cell phones and Internet cafes, as well as any number of yet unknown organizations or gadgets, do not qualify here. They may exist and still turn out no or only very little knowledge.

The intangible symbols…

We are not likely to organize in formal creative groups that reside in shining buildings and we are not likely to own name cards that testify to our membership in a multitude of such groups.

Rather, the change will be heralded by intangible symbols. It will be supported more by clearly pronounced interests than by laws and regulations. It will reveal itself as a changed connective fabric in a society and as a changed culture of doing things. It will be built on justified expectations of behaviour by others. It will have organizational backing to capture creative value and reward value creators.

Those clearly pronounced interests could grow only from accumulated experience. Right now, the experience with mass production of knowledge is positive on the business side. That is why managers of business firms hire knowledge management consultants and the services that orchestrate spaces for knowledge development mushroom. This conviction that access to well-organized information, coupled with the diversified tacit knowledge of creative individuals who act within knowledge-creating groups, is valuable has yet to build up in other areas of social life. But once it settles, there will be support for renegotiating institutional arrangements to give various groups access to this powerful resource. Some of this support will reveal itself in the reorganization of hierarchies and the abolishment of fixed centres. Some of it will impact the social standing and acceptability of people who devote their capabilities to creative work. Some will rework laws and make the State the guardian of the new order. Freedom of speech and creative expression, along with freedom to associate and assemble will have a good chance to move from their now prevailing positions of slogans, by and large mocked throughout most of the world, to positions of accepted building blocks of the new civilization. This would exchange a unit of control for uncountable units of "new meaning."[94] Powerful and numerous social forces will watch the cultural and legal situations surrounding the creation of new meaning and will push for informal and formal institutional changes.

The informal norms of a civilized society would then have to be adjusted. Those norms regulate everyday behaviour and not only tell us to greet each other in the

morning but also to build relationships on the basis of culturally defined respect for one another. This is the connective social fabric that allows us to negotiate most relations with others via customs and habits, rather than via courts of law. It recognizes and processes in an accommodating way, assumed features and needs of fellow human beings. It defines in a specific way and respects a certain vision of their humanity. The broader that definition, the more civilized the society. In the Knowledge Society this vision of others to be respected and acted upon would include acceptance and respect for the creative potential of all people everywhere as an expression of the humanity of all people everywhere.

The way in which people approach tasks would also have to change. The current cultural paradigm, "I am in charge, so I know it all (or should pretend that I know it all)" would shift towards "I am in charge, so I must involve others to assure the most creative solution." Accordingly, the measure of leadership would undergo a change too. Leaders who know what they do not know, are able to predict what should be known and are good at organizing others for creative reflection would stand out as examples of excellence.

The justified expectation that others will always be ready to share their tacit knowledge and participate in creative reflection will become the next new norm. This expectation would naturally be attached to a reward system. Using one's tacit knowledge and private time to creatively reflect on information would have a price. It could be paid in money, or it could be paid in social recognition and the personal dignity of living out one's creative potential.[95] One almost wishes that the latter would eventually prevail. It may, depending on the social agreement about wealth distribution that emerges in the Knowledge Society.

The tangible demand…

With social institutions rearranged like this the number of factories of new meaning can expand indefinitely. Members of the society could be like play dough, always ready to assume the shape of a space for knowledge development, remain in that shape for a certain period of time and return to their previous "always ready" state when the creative job is done. This dough could fill spaces in organizations and between organizations. How much it did would depend on pronounced demand.

Much of that demand will depend on the way of life and personal time management.

The way of life can embrace curiosity (need to know) for matters closely related to everyday life as well as for matters seemingly far-removed from it, including, for instance, gains in natural sciences or questions and dilemmas of an existential nature. It can embrace politicizing views, judgments and discussions of such matters, not even with a particular, time-bound goal in mind, but almost for the sake of debating and coming to sharp, clearly pronounced opinions.[96] As a minimum, such a way of life would be capable of developing tacit knowledge, debating skills and comfort with politicizing issues. Where practiced, it has been instrumental in the development of a thinking society. It has also been making people more ready to join processes that lead to a specific goal, producing "new meaning" for application in practical situations. To flourish, way-of-life-based factories of creative ideas would have to enjoy support in the prevailing culture of a community and there would need to be high social reward for people's participation (e.g. prestige in the community).

An offspring of the "way-of-life" approach could be, for instance, individual artistic creation to produce (aesthetic) creative value for the enjoyment of the creator(s) and the (free) enjoyment of others. This would add to the fullness of life of individuals and

groups. High levels of social acceptance and high social rewards are needed. The human dignity of creativity and/or participation would play a major role here. There would be dignity-of-creativity-based circles for knowledge development.[97]

Of course some of that demand will be related to running the market economy. It runs on gains in productivity and robust consumption patterns. In both, creation of new meaning is a key factor. To flourish, these market-centred factories of new meaning (in the majority of cases, new meaning in the form of technological innovations for production of goods and services and/or in the form of intellectual property for sale at the market) must function in a sound economy, with solid macro-economic balance, robust trade and investment flows. Individual gain would remain the motivating factor. These would be mainly income-based circles for knowledge development. [As mentioned consistently, dignity-of-creativity-based circles are also imaginable here, provided alternative models for wealth distribution can be designed and successfully implemented.]

Some of that demand will be related to the governance of smaller and larger social groupings (from families to nations to subject-specific international communities). Here the products will include goals, values, policies and practical activities. To flourish, these factories of new meaning must function in a broader political space in which genuine participation is expected, accepted and rewarded. This takes an enlightened interest that is clearly pronounced and institutionalized, something only vaguely in existence these days, even in societies that adhere to democratic principles of governance. These would be mainly dignity-of-participation-based circles for knowledge development.

In the end, it is worthwhile to stress one more time the importance of clearly pronounced interest in this type of transformation and of the strength of the social forces that stand behind that interest. The future of the Knowledge Societies will turn on it.

Box 11

New meaning from a cup of coffee 350 years later: Socrates Cafés

"There is a buzz in the air at the El Diablo Coffee Co. in Seattle, and it is not just coming from the aroma of the shop's Cuban-style espresso drinks. On a recent Wednesday evening, as most patrons sat quietly reading books or tapping away on their laptop computers, about 15 people gathered in a circle discussing philosophy. "When is violence necessary?" asked one. "What is a well-lived life?" asked another, as the group enjoyed a well-caffeinated, intellectual high.

Known as a Socrates Café, the group at El Diablo is just one of 150 or so that meet in coffee shops, bookstores, libraries, churches and community centers across the country. (…) [T]he cafés are designed to get people talking about philosophical issues. Using a kind of Socratic method, they encourage people to develop their views by posing questions, being open to challenges and considering alternative answers. Adhering to Socrates' belief that the unexamined life is not worth living, the cafés focus on exchanging ideas, not using them to pummel other participants.

(…) While a modern-day discussion group based on teachings of a thinker from the 5th century B.C. may seem quaintly outdated, Socrates Cafés have found a surprisingly large and diverse following. Meetings have been held everywhere from a Navajo Nation reservation in Ganado, Ariz., to an airplane terminal in Providence, R.I. Ongoing groups have formed in prisons, senior centers and homeless centers. In recent months, international groups have popped up in Afghanistan, Finland and Spain.

(…) For Philips [Christopher Philips, founder of Socrates Cafés, author of *Six questions by Socrates*], the dialogue groups are about much more than good conversation. "It's grass-root democracy. It's only in a group setting that people can hash out their ideas about how we should act not just as an individual but as a society." (…) He says, "The whole idea is not that we have to find a final answer; it's that we keep thinking."

(…) The mood, tone and topic of discussion for each café vary greatly, depending on the participants. Typically, the topic is decided by group vote, and anyone can suggest an idea. At El Diablo, the mostly middle-aged crowd (ages 25 to 66), clad in earth tones and comfortable shoes, settled on a tough one: Do nation-states with greater power have greater responsibility to act ethically? "Is any act that a nation makes in its own self-interest moral?" asked Matt Walker, 40, a technical writer. "I say no." "Well, what's the nature of self-interest?" retorts housepainter Steve Crawford, 50. (…) After two hours of discussion no conclusion was reached, but that is not the point. "It's calisthenics of the mind," says Margaret Friedman, 35, a writer and real estate agent who took part in the exchange."

Source: "All the Right Questions," Anita Hamilton, *Time,* 5 April 2004

Question 12: What institutional changes are required to secure the needed supply of ICT?

Following the prevailing understanding of the "digital divide,"[98] one almost has the temptation to say: none.

ICT has become a product with great name recognition. It has been proclaimed the new language that people and organizations have to master. Additionally, the culture industry has converted many ICT products into symbols of social status for indi-

viduals, organizations, businesses and even for countries. The R&D in this area works tirelessly, with great gains, to lower the costs of computing and connectivity. Wireless solutions break the enclave of the "wired" world and broadband breaks the barriers of speed and vastly increases the volume of information that can be communicated in a unit of time. The venture investors, after the initial shock of the burst of the dotcom bubble, seem to have recovered. Bridging the digital divide is on the development agenda of governments and the international development community. This adds to the private funds invested as well as to demand. Surely, things will not happen overnight, but today over 1 billion people own a cell phone and every day we are closer to 1 billion people who have access to the Internet. As compared with other ground-breaking technologies (e.g. printing press, telegraph, steam engine, electricity, traditional telephony), the speed of the introduction of modern ICT into society is really breathtaking. What else is needed?

The reply would be, context[99] (see Box 13).

We have to distinguish among the social contexts in which modern ICT functions and avoid the fallacy of believing that somehow ICT by itself is going to lead to the Knowledge Society.

"Lifestyle ICT" is ICT placed within the context of fashionable lifestyle demands. "Knowledge creating ICT" is ICT that operates within the context of mass production of knowledge. And knowledge-creating ICT that works predominantly in the realm of the Knowledge Economy is different from knowledge-creating ICT that works within the framework of the Smart Knowledge Society. Dual use is possible and it happens all the time, but bridging the "lifestyle ICT" (e.g. iPod) with the Smart Knowledge Society would require a leap of faith that is almost beyond imagination. Even when a digital photo camera in the hands of a citizen, especially if combined with the Internet, enhances government accountability, the camera by itself does not create a context for accountability. It is a tool to convey accountability-related content. Without a proper accountability context that is guaranteed by the rule of law, all the digital camera can do, in extreme negative cases, is to put the picture-taking citizen on a collision course with authorities. That is why on most such occasions it would not be used.[100]

Dual use requires the parallel existence of a multitude of contexts. And the state of their existence and quality says more about "the needed supply of ICT" than any other statistic. It is always "ICT in the context of" that should be examined, not ICT per se. This allows us to add a new dimension to the quest for bridging the digital divide. "Bridging the digital divide for what?" should be the focus of that debate. Bridge first and worry later is not good enough. That can be only in the interest of ICT vendors.

The predominant context for ICT these days is that of a democratic society that features an encompassing interest that is narrower than the super-encompassing interest that would use power in the interest of all. As a rule, this allows multiple contexts and also varies the intensity of these contexts.

In some situations, particular contexts are discouraged.

This occurs mainly within the context of genuine political participation. The effort to discourage sometimes moves beyond the lack of positive action (e.g. conducive transformation and change) and turns against ICT as a medium.[101] The scare of dual use, even without a conducive political context, is known to have converted ownership of a computer or logging onto certain Internet addresses into a crime. On occasion, political pressure is exerted on the owners of the Internet servers and browsers to control – and in extreme cases to interrupt – certain kinds of exchanges. Databases are known to have disappeared from servers. Domains are known to have been shut down. Awareness of security-related checks has a "chilling" effect whereby communications media offered by mod-

ern ICT are avoided so as not to allow identification. Open government censorship alters the content of communications. Fear of lawsuits against privately owned servers and browsers alters it too. In most cases though, it is the immovability of the legacy institutions that narrows the context of genuine participation. Mass-produced knowledge with political application – difficult as it still is to come by – meets anaemic demand. Some cheerleading or booing in the form of e-mails to politicians; e-voting as a medium to lower the cost or increase precision (though the opposite often occurs); and e-polling are broadly accepted. E-debate leading to altered policy and decision making remains rare.

In other situations, contexts tend to be narrowly defined.

This is the case, for instance, in the context of e-government. As mentioned earlier, by and large, e-government remains defined by its goal of achieving greater efficiency of public administration as well as transparency and speed of communication in financial matters, largely in response to the pressures of the global economy. In social services, it can reflect only the philosophy and budgets that prevail in this area in a given society. Where neo-liberal philosophy rules and New Public Management is strong, no amount of ICT is going to recover some of the public functions that have been eliminated from public budgets or shifted to the private sector for implementation. Expanding this context does not require ICT but rather, changed public social policy and a broadening of the encompassing interest in which public power is exercised in a society.

In still other situations, contexts tend to evolve.

Civil society has many uses for ICT, for delivery of social services, creation of groups of shared interest, expression of opinion in the public sphere and joint activities in areas of common interest, from community affairs to global affairs. These contexts would be as strong as a civil society itself. In most places in the world the grassroots organization of citizens does not enjoy unquestioned government support, but rather, constitutes an attempt to broaden the encompassing interest outside the power-sharing arrangements prevailing in a given political environment. Optimists would argue that we are on the brink of the global associational revolution. Realists would argue that for a while what exists – with the help of ICT – will become better, but that meaningful growth of associations in the world would hinge on an important institutional shift in public power arrangements.

Therefore, the answer to the question about the "needed supply of ICT" would vary.

Supply of ICT in the context of consumerist lifestyle could be as abundant as the consumer demand that the culture industry manages to create.

Supply of ICT in the context of business operations could be as abundant as the market dictates.

Supply of ICT in the context of public administration could be narrowed to match the prevailing stage of e-government development and its use.

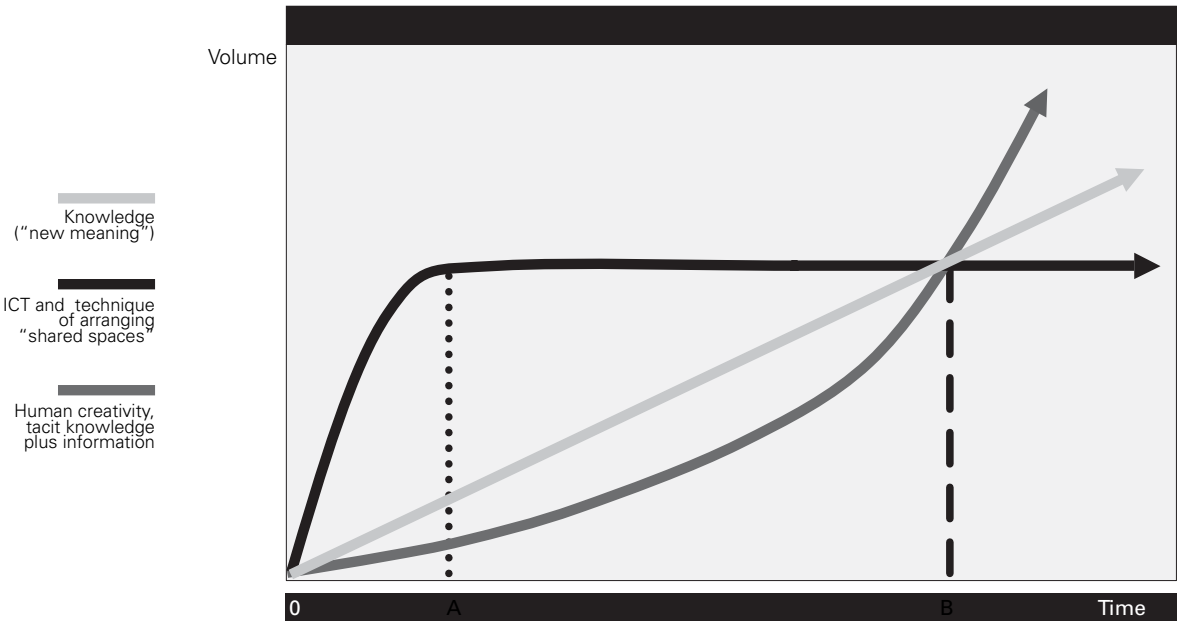
Supply of ICT in the context of civil society could be somewhat limited to match the existing public power arrangements.

Supply of ICT in the context of genuine participation could be narrowed even further; in the world at large, contexts for genuine participation practically do not exist.[102]

Therefore, while worldwide discussion about the needed supply of ICT remains focused on financial resources, it could much more usefully be focused on the indispensable contexts for ICT deployment. Granted, given institutional transformations that build up such contexts, this supply may grow dramatically and steadily. This would associate ICT with limitless human and information development. Illiteracy, lack of skills and underdeveloped information flows may limit it at first. But eventually it would become a prime facilitator of human imagination and creativity – a truly limitless resource.

In this connection it must also be noted that the accelerating impact of modern ICT on mass production of knowledge is bound to slow down and eventually reach its limits. [The same is true of the related technique of arranging "shared spaces for knowledge creation."] In the future, beyond a certain point adding speed and precision to information management within the process of knowledge development will start turning out diminishing benefits and eventually stabilize as a constant. There is always a set of explicit knowledge products that contains the minimum information a "shared space for knowledge creation" needs to process in order for "new meaning" to appear. Assuming that the prevailing institutional set up allows accessing all such information, delivering it – in human terms – "instantaneously" will be good enough. From the point in time when "instantaneous" delivery becomes feasible, perfecting this capacity even further would cease to affect the speed and volume of the mass production of knowledge. This is not to say that in other contexts, e.g. artificial intelligence, such progress would not be welcome. However, in the context of knowledge development, the human factor – the limitless development of people and information – will start dominating this process pretty much in an uncontested way. We are at the very beginning of that road, when the legacy of the underdevelopment of people and information is vast and new technology is dazzling us with the untapped possibilities that it offers. Therefore, right now, modern ICT does play the role of the engine of progress in the mass production of knowledge. It is also less expensive to develop and apply, if compared with the cost of the needed institutional transformations that would release the power of human creativity of all people everywhere. However, responsible leadership would look beyond this immediate stretch of time into the future and, in earnest, start building human capabilities – the sole accelerator of knowledge development that will never become obsolete as time goes by.

Graph 2
Mass production of knowledge: evolution of main factors over time



Accordingly, the dynamics reflected in the above graph are important. Today, mankind is barely past point 0 on the timeline, with gains from the introduction of ICT playing a revolutionary role in our capacity to mass-produce knowledge. As explained above, this method of powering mass production of knowledge will end at a certain point in time (point A in the graph). From that point on, the burden of accelerating mass production of knowledge will move towards the "human creativity – tacit knowledge – information" factor. The distance between A and B as well as the steepness of the "human creativity – tacit knowledge – information" curve beyond point B will depend on the nature of institutional transformations. After point B, it is all only about the limitless development of people and information, that is, if one cares about accelerating the mass production of knowledge.

Introducing hybrids of humans and machines or robots with high levels of artificial intelligence (AI) would not seem to alter this picture. If, on that momentous summer day, Isaac Newton had not been alone under the apple tree but in the company of a robot with AI higher than his own, and had not one but two apples fallen simultaneously with one of them hitting the future Lord and the other hitting the robot, still only one of them would have felt the rage that transformed itself into the "why" question and a lingering curiosity to find the answer. And this would not have been the robot.

Box 12

Seeing the ethical dimension

"It is now increasingly being recognized that the incorporation of more and more human aspects into the machine, leads to a tendency of (…) unconscious substitution [of these aspects] by machine parameters. This includes substitution of 'purpose' by 'cause and effect'; diversity by sameness; judgement by calculation; belief by fact; knowledge by data; effectiveness by efficiency; (…). This techno-centric perspective, rooted in the notion of separation of the hand and brain, leads to the (…) separation of the objective from the tacit. This focus thereby leads to a belief in elimination of the uncertainty, ambiguity and diversity. The danger of this 'technological dream' is that it leads to seeing the separation of the individual and the community; private and public; reason and emotion; and, function and the social [usefulness], as a core rationale for designing the digital society. Thus it tends to redefine the societal, cultural and economic agendas in terms of (…) technologies of the "sameness" and of the 'one best way.'

In this techno-centric vision, digital technology tends to shape the Knowledge Society towards a machine-centered system in which machines are becoming more like people and people are becoming more like machines. In this vision of the world, the human tends to be seen as a component of the technological convergence, interacting with the world as a cog in the rule-based machine system.

The implication of this view is that the knowledge system is seen as an integral component of the digital technology design. In other words, it is the digital technology, which shapes the knowledge system and its interactions, rather than the human shaping the digital technology to create new spaces for interaction and communication. But to see human just as an object (…) tends to deny and marginalize the creative, imaginative and innovative abilities of the human. Moreover this view impoverishes the role of the human as a social citizen, playing various roles such as that of an actor, participant, interlocutor, mediator, and decision maker at varying degrees of interaction in varying contexts. If we see the human (…) as a social being, an individual, a member of the community, a member of an organization, a citizen or a participant in the networked communities, then the challenge is to design knowledge systems and tools which facilitate and support the multi-faceted roles of the human rather than reducing the role of the human to the rule-based machine. In other words we are seeking to design systems

Box 12 (cont'd)

and tools which enable and facilitate people to make effective use of their capabilities, while making the optimal use of the machine capacity. In other words we are seeking to design a 'machine with a purpose' in the sense of creating a symbiotic relationship between the human and the machine.

Symbiosis is central to the discussion of building sustainable communities of interaction and communication. However, for the idea of symbiosis to take shape, we need to question the underlying assumption of science and technology (…) affecting deeply the society in transition from industrial society to Knowledge Society, and in many developing countries, from agricultural societies to knowledge societies. We need to be aware of the danger of the two notions of scientific rationality: the notion of 'one best way' and the notion of convergence. The danger is that in following the logic of convergence, we may be tempted to treat diverse and disparate situations with mathematical precision, and make them converge into a universal entity in the tradition of 'one best way.' This may lead us to see diversity and the idea of the alternative as hindrance rather than as asset (…). The challenge therefore is to develop a human-centered framework for knowledge systems (…), which are based on the valorization of diversities (…).

To get a perspective of such a challenge, we need to recognize the way [in which] digital technology is shaping the networked world. (…) [We] can see the networked world in the form of a public sphere (the Internet), the aesthetic sphere (post-modern) and the ethical sphere (engaged).

In the public sphere of the Internet, the user can become a detached spectator, detached from local practices, detached from involvement and concrete actions. The temptation of the Internet world is that it becomes a world of simulated images, simulated commitments, leading to simulated life, transforming task into unreal feat or artifice and reality into a theatre.

In the aesthetic sphere of netsurfing, the user enters into the realm of post-modern self, content-less world of knowing and being everything, and being in contradiction with oneself.

In the ethical sphere of stable identity, the user is engaged in involved action, pursues need-based and purposeful goals, makes committed choices, engages in an unconditional commitment, and uses knowledge as a valuable resource."

Source: Karamjit S. Gill, "Rethinking ethics of development – a human centered agenda." Paper (unpublished) presented to the UN Ad Hoc Group of Experts Meeting of Knowledge Systems for Development, New York, 4-5 September 2003.

Question 13: How is whether a society is advancing or regressing as a Knowledge Society measured?[103]

Based on the analysis presented above, the Report attempts to measure society's focus on the development of people and information as well as to reach an understanding of a society's readiness to put these two assets to practical use in the process of knowledge development.

The Report measures the nurturing of people through two indicators: government health expenditure as percentage of total government expenditure, and military expenditure as percentage of total GDP. The former represents a proxy measure of the degree to which a country is willing to invest in the well-being of its citizens. The latter documents the opportunity cost, economic and social, of developing the military. In many situations, it can serve also as an example of diverting public resources towards a group with narrow encompassing interest.

As for the advancement of information, the Report uses two other indicators: a country's total investment in research and development – expressed as percentage of GDP, and a country's investment in basic education, expressed by the ratio of pupils per teacher in primary education. The reason for the former indicator is fairly straightforward: it signifies the willingness and ability of a country to organize for the formal development of knowledge, in this case, knowledge "to do," as embodied in the "new meaning" of technical innovations. The latter indicator is meant to represent not only the "quantitative" investment in education (more teachers per pupils implies more expenditure), but also attention to the quality of the teaching, on the assumption that small classes are more likely to favour interaction and stimulate a child's participation and creative thinking. Naturally, there could be many different ways to measure the quality of education but this is the only one that could be found with data available for a reasonable number of countries.[104]

In measurement of the society's readiness to put people and information to practical use in the process of knowledge development, the simple existence of a democratic rule could be a good proxy indicator if "democracy" had the same meaning and the same degree of realization in all countries. Unfortunately, countries tend to vary widely in the ways in which their institutions actually respect democratic rights and principles. And, no inter-governmental organization has established measures and/or stable monitoring systems for the absolutely crucial for Knowledge Society measures of democratic rule and freedom. In this situation the Report has faced an option of not reflecting them at all or choosing from several existing non-governmental sources one that seems most accepted internationally. This is how "freedom from corruption," based on data collected by Transparency International, has been included in calculation of the Advancement Index.

The Report uses the proxy of the "freedom from corruption," on the assumption that relatively corruption-free societies tend to feature also more robust political opposition, better protected freedom of speech and relatively freer press. Corruption creates distortions in the allocation of resources, but most of all, violates the principle of equality before the law, heightening inequalities and spreading distrust in public institutions, thus nullifying the deepest meaning of participation. That is why a low degree of corruption (or perception of corruption) is an important component of an institutional system that supports the Knowledge Society.

The results of the five selected indicators are given in Table 4.

With the exception of Sweden, which is firmly in first place thanks to the highest R&D expenditure and one of the best freedom ratings in the sample, all other Scandinavian countries tend to lose position as compared with their Assets Rankings.

The countries that occupy the top four positions following Sweden are: Switzerland, Germany, Canada and Japan. What makes these countries surpass their Scandinavian "rivals" are mainly low military expenditures and high government investment in public health. However, the Scandinavian countries still remain in the top ten, showing very high rates of research and development expenditure, very good pupil/teacher ratios and excellent "freedom from corruption" ratings. The only exception to this trend among the Nordic countries is Norway, because of its relatively low investment in research and development. The Eastern European countries captured by this sample tend to have lower research and development expenditure and lower "freedom from corruption" ratings.

Overall, one specific case, Costa Rica, is worth special notice.

Costa Rica (position 36 in the Assets Ranking) manages to get into the top 20 "advancing" countries thanks to an excellent record in government expenditure on health, low military expenditure (the lowest of all the sample countries) and relatively good values of "freedom from corruption" and pupil/teacher ratios.

Table 4
The Advancement Index

	Country Name	Adv. Index	R&D Expend.	Military Exp.	Gov. Health Exp.	Pupils per teacher	Corruption Index
1	Sweden	0.844	1.000	0.795	0.504	0.975	0.946
2	Switzerland	0.766	0.606	0.928	0.519	0.900	0.878
3	Germany	0.765	0.572	0.867	0.779	0.875	0.730
4	Canada	0.764	0.415	0.916	0.748	0.875	0.865
5	Japan	0.758	0.715	0.928	0.763	0.750	0.635
6	Denmark	0.758	0.473	0.855	0.489	1.000	0.973
7	Finland	0.755	0.790	0.807	0.328	0.850	1.000
8	USA	0.732	0.649	0.578	0.855	0.875	0.703
9	Netherlands	0.729	0.456	0.855	0.443	1.000	0.892
10	New Zealand	0.726	0.236	0.928	0.641	0.850	0.973
11	United Kingdom	0.708	0.427	0.759	0.687	0.800	0.865
12	Belgium	0.701	0.441	0.892	0.504	0.950	0.716
13	Austria	0.682	0.437	0.952	0.328	0.925	0.770
14	Norway	0.682	0.359	0.819	0.672		0.878
15	Australia	0.680	0.337	0.711	0.794		0.878
16	Ireland	0.645	0.250	0.940	0.580	0.750	0.703
17	France	0.638	0.499	0.735	0.557	0.775	0.622
18	Spain	0.635	0.200	0.904	0.550	0.900	0.622
19	Italy	0.584	0.219	0.819	0.504	0.975	0.405
20	Costa Rica	0.582	0.016	1.000	1.000	0.625	0.270
21	Israel	0.563	0.842	0.000	0.389	0.950	0.635
22	Hungary	0.547	0.197	0.837	0.389	0.975	0.338
23	Estonia	0.545	0.151	0.807	0.435	0.900	0.432
24	Czech Republic	0.536	0.282	0.795	0.588	0.800	0.216
25	Panama	0.529	0.051	0.904	0.916	0.625	0.149
26	Uruguay	0.529	0.030	0.807	0.649	0.725	0.432
27	Tunisia	0.527	0.076	0.867	0.664	0.675	0.351
28	Mexico	0.510	0.072	0.940	0.786	0.575	0.176
29	Poland	0.493	0.129	0.842	0.344	0.975	0.176
30	Chile	0.492	0.098	0.566	0.481	0.625	0.689
31	Croatia	0.488	0.204	0.760	0.489	0.800	0.189
32	Republic of Korea	0.473	0.683	0.723	0.237	0.450	0.270
33	Republic of Moldova	0.465	0.240	1.000	0.321	0.750	0.014
34	Latvia	0.450	0.064	0.904	0.206	0.875	0.203
35	Greece	0.444	0.129	0.530	0.366	0.925	0.270
36	Slovakia	0.420	0.125	0.820	0.191	0.775	0.189
37	Bulgaria	0.416	0.105	0.735	0.221	0.800	0.216
38	Malaysia	0.413	0.064	0.804	0.008	0.800	0.392
39	Trinidad &Tobago	0.407	0.000	0.976	0.000	0.750	0.311
40	Brazil	0.390	0.154	0.795	0.183	0.600	0.216
41	Ukraine	0.383	0.196	0.880	0.092	0.750	0.000
42	Bolivia	0.368	0.038	0.855	0.298	0.650	0.000
43	Colombia	0.358	0.028	0.639	0.336	0.600	0.189
44	Egypt	0.308	0.014	0.614	0.076	0.700	0.135
45	Madagascar	0.211	0.010	0.904	0.099	0.000	0.041

Note:
The Advancing Index for Norway and Australia is calculated as an average of four instead of five indicators, since data on the pupils/teachers ratio was not available for these two countries. While we haven't included in our ranking any country for which we did not have full availability of data, Norway and Australia have been included since these two countries have proved to be important benchmarks on several of the other indicators adopted.

Notes

44 Compare: "With most things, the average is mediocrity. With collective intelligence, it is excellence. You could say it is as if we have been programmed to be collectively smart. (…) (This should be distinguished from situations) when people take decisions one after another, instead of simultaneously. A problem known as 'cascading' tends to persuade them to follow the herd, rather then independent judgement (e.g. lynch mobs). Or when they lack sufficient information (e.g. cars in a traffic jam) or are constrained in their thinking by artificial rules. " Source: James Surowiecki, *Why the Many Are Smarter Then the Few and How Collective Wisdom is Shaping Business, Economics, Societies and Nations*, Doubleday, 2004.

45 An example closer to the ICT home is the story of the first computer, designed, but never built due to lack of technically competent people who could put the "new meaning" to practical use. Allegedly, "The first true computer was designed in the 1830s by Charles Babbage, a British inventor, who called it an 'analytical engine.' According to Crevier, Babbage's 'steam-driven contraption would have contained all the elements of a modern computer, including memory and processing.' But Babbage was never able to complete a working model of his creation because craftsmen of the day were not capable of making the complex parts it required." Source: Masci, D., 14 Nov. 1997, "Artificial intelligence," The CQ Researcher Online, 7, retrieved 16 July 2004, from http://library.cqpress.com/cqresearcher/cqresrre1997111400 Document ID: cqresrre1997111400.

46 Analysing this issue from the point of view of the knowledge-based economy, Paul A. David and Dominique Foray, *Economic Fundamentals of the Knowledge Society, Policy Futures in Education – An e-Journal*, 1 (Special Issue "Education and the Knowledge Economy," January 2003) observe: "The crux of the issue lies in accelerating (and unprecedented) speed at which knowledge is created, accumulated, and, most probably, depreciates in terms of economic relevance and value. (…) A new kind of organization is spearheading the phenomenon: knowledge-based communities, i.e. networks of individuals striving, first and foremost, to produce and circulate new knowledge (…). Society as a whole is shifting to knowledge-intensive activities. (…) More and more 'innovators' tend to be appearing in unexpected situations: users as the source of innovation, 'lay people' involved in production of scientific knowledge within such realms as health and the environment."

47 See footnote 1 above. Source: Conversation with Ikujiro Nonaka, ibid. It must be noted also that in attempts to capture and describe virtually the same phenomenon, the literature refers to "creative networks" and "knowledge communities." However, the above described approach of "ba" or "shared spaces for knowledge creation" seems most convincing.

48 "(…) every room we go into has a different atmosphere. If we go home, if you go to your room, your room feels like home. It doesn't feel like a hotel room. It's partly because it's a different physical circumstance, but your atmosphere is in that room. So there could be a sense of place connected to these things. But it's more than that. It's these other levels of place. One of the most important things we've learned is that there is an incredibly important factor called 'the nature of the space.' And what we've done is use a term, which is controversial (because it's difficult to translate) and not a terribly well liked term, but a term that turns out to be incredibly useful: 'container.' The roots of it are very nice – to hold together – to hold not in the physical sense simply or only, but to hold in consciousness the factors that are moving in and among a group of people. And in some respects, the art of a practitioner is to read the quality of the container. What can be said here and thought here and felt here that could not be done anywhere else? (…) The container is the pattern of energy and relationship. It's the quality of relationship and the pattern of energy that moves in that quality of relationship. And the relationship isn't just interpersonal – it's the relationship with everything. There's a distinction here between that which is within something that happens and the something that happens. (…) And I think there are several 'somethings' that happen. One is a certain field – what a number of us are calling a field of energy. You could think of it as a magnetic field. Within that field is a focus, though, and the focus tends to move. So there's a pattern of design within the field. So it's actually quite precise to the point where you can begin to have a sense of – if it doesn't always come out in ways you predict because none of our lenses are perfectly clear yet – of where things might go next. You can begin to anticipate where things are going. Some people say future events cast their shadow. What's that mean? It means the pattern of energy has a certain order in it and a certain design in it and you can sense what that is." Source: Conversation with Bill Isaacs,

Cambridge, MA, 21 December 2001, Interview by Otto Scharmer, accessed at http://www.dialogonleadership.org/Isaacs.htm#six.

49 Compare: "In 1978, top management at Honda inaugurated the development of a new concept car with the slogan, 'Let's gamble.' The phrase expressed senior executives' conviction that Honda's Civic and Accord models were becoming too familiar. Managers also realized that along with a new post war generation entering the car market, a new generation of young product designers was coming of age with unconventional ideas about what made a good car. The business decision that followed from the 'Let's gamble' slogan was to form a new product-development team of young engineers and designers (the average age was 27). Top management charged the team with two and only two instructions: first, to come up with a product concept fundamentally different from anything the company had ever done before; and second, to make a car that was inexpensive but not cheap. (…) The 'evolutionary' trend the team articulated eventually came to be embedded in the image of a sphere – a car simultaneously 'short' (in length) and 'tall' (in height.) (…) This gave birth to a product concept that the team called 'Tall Boy,' which eventually led to the 'Honda City,' the company's distinctive urban car. The Tall Boy concept contradicted the conventional wisdom about automobile design at the time, which emphasized long, low sedans. But the City's revolutionary styling and engineering were prophetic. The car inaugurated a whole new approach to design in the Japanese auto industry based on the man-maximum, machine-minimum concept (…)." Source: Ikujiro Nonaka, Hirotaka Takeuchi, "The Knowledge Creating Company," ibid.

50 The model of "shared spaces for knowledge creation" does not contradict "the lone wolf" approach to creativity where a single creator is behind the appearance of "new meaning." In all such cases, the single creator is de facto participating in shared spaces for knowledge creation and goes through all the stages of knowledge development, but in forms that are stretched in time and space. In an extreme case, s/he can "socialize" exclusively via benefiting from the experience of others as reflected in written transcripts and "externalize" the "new meaning" in difficult-to-process analogue signs (e.g. hand-written notes, symbols of pictures). The genius of creativity is still there. The potential for great social benefit is still there. The speed and mass production factors are not.

51 Compare: "An increasingly common organizational team in the information age is the **virtual knowledge team** (VKT). Although there are compelling reasons for using these teams, they almost always must overcome a number of especially difficult learning impediments to be successful. (…) It appears essential that these VKTs work especially hard to establish a platform for effective learning exchanges. Effective VKTs pay special attention to what we call learning protocols agreements on how to interact with each other, govern activities, use communication technologies, make decisions, prioritize multiple agendas, establish values and goals, and so forth. Many of these protocols are helpful for any team, but for VKTs whose primary interaction is not face-to-face, they are critical. We suggest VKTs employ two practices. One is virtual collocation, which creates a sense of community and develops the team foundation on which learning protocols can be built. The second is to sit down together in a start-up meeting to establish and agree on the learning protocols. (…) Many of these teams have their virtual office location established through technology: a common cyberspace locale, such as a server or a web-page for e-mail messages and announcements. To make it more human, some VKTs scan in their photographs on their e-mail location. And some even establish real office space. One (…) project team, for instance set aside a room with a desk for each team member. Although the desks were seldom used – since team members were located all around the world – they created a psychological home base." See: Kimball Fisher, Mareen Duncan Fisher, "Shedding Light on Knowledge Work," *The Journal for Quality and Participation*, Cincinnati, Ohio, July/August 1998

52 This Report refers to "social forces" as "the organized human will."

53 The emerging "**Knowledge Economy**" represents work in progress. At its current stage, its most pronounced feature is the attempt to digitize what exists. Thus, in all fairness, right now we should be talking about "d-economy" rather than about "k-economy." The **digital economy** is the shorthand for the transformational impact that ICT and especially the Internet is having on every single aspect of business activity. It radically affects every element of the value chain. It allows businesses to re-engineer both their internal processes and supply chain relationships to strip out waste, improve quality and give better customer service. It has proven most effective on the side of **electronic commerce** (digital transportation, communication and money transfers). E-commerce is believed to have a huge impact on the way that markets are organized. Direct links between consumers and

suppliers hit traditional intermediaries and brokers, for example those who have sold insurance, financial services and travel packages. New forms of intermediary emerge (such as information brokers, quality guarantors and "best buy" sites). The value of brands is greatly enhanced, in many cases sharply lowering the cost of entry to new markets where the trust implicit in brands can be further exploited. Business-to-business trade is revolutionized, accelerating the current shift away from conventional vertical integration towards complex structures based on contracting out, joint venturing and other forms of partnership (i.e. decentralized operations loosely coupled, networking, economics of agglomeration). The digital economy feels very comfortable with the currently existing market as the overall mechanism for its organization. What makes the digital economy move in the direction of the **knowledge economy** is the shift in the way in which value is generated along the business value chain. Competition over innovations and reducing adaptive costs supercedes competition over productivity and transaction costs. Change also occurs in the way in which technological innovations are produced and handled (e.g. the need for large-scale multi-disciplinary research) and in the nature of products and services the economy brings to the market. With some hesitation, business firms are applying the generic techniques for mass production of knowledge inside their organizational structures. Thus the multi-national companies are morphing into **Global Production Networks** whose main task is to diffuse knowledge internationally and build local capacities to raise local absorptive capacity. Shared spaces for knowledge creation, augmented by ICT, physical and virtual, are becoming the standard for mass production of the knowledge "to do," the foundation of technological innovations. And the volume and worth of knowledge-based, knowledge-related products is increasing among the bulk of goods and services being offered on the market. Additionally, economy of diminishing returns is substituted by economy of increasing returns. This leads to a de facto monopoly. Product development costs may be high, but once the product starts rolling off the production line (hence the strategic rush with a new product to the market), the cost of making additional units drops very sharply. A firm can raise sales by simultaneously raising output, lowering costs and reducing prices. This constitutes a positive feedback into the economy; and, the more a firm wins at this stage, the easier it is for it to encircle its competition. However, all this challenges the market as the organizing mechanism for the Knowledge Economy. It cannot deal easily with goods and services that are void of excludability, rivalry and transparency. The "invisible hand" becomes blind. Possible solutions may turn out to be anti-social, for example: use of law (strict, enforced IPR and copyright regimes) or technology to limit freedom of consumers; revenue generation methods that lower the quality of content; substituting transparent goods and services for transparent customers (loss of privacy); and creating an artificial demand via the ICT-augmented culture industry. Such an economy, especially in its global dimension, has every incentive to make many "local" attributes of its functioning (e.g. jobs [as distinct from work], pensions and welfare) disappear.

54 The 2003 UN Global E-government Survey notes, "(…) the countries are not doing a particularly good job of involving the public into the government decision-making. The top 20 countries, on average, are currently providing on-line opportunities for citizens' participation that are seriously lacking in relevancy and usefulness, and at only about a third of the potential of what they could offer. (…) Contrary to the current popular perception, a very small proportion of countries (14 percent) offered on-line consultation facilities and an even smaller [number of countries] (9 percent) allowed any user feedback on official policies and activities put out on the government web sites. There appears to be a gap between rhetoric and reality, especially in the area of engaging the citizens in public decision making. Only 13 out of 173 countries or eight percent of the total had a clear policy statement on the web site encouraging people to participate in this process." Source: *2003 World Public Sector Report: E-government at the Crossroads*, UN, New York, 2003

55 Note that the *2004 UN Global E-government Readiness Report* [United Nations, New York, 2004] suggests abandoning the term "digital divide" and invites thinking in terms of the "**access divide**." It talks about the equilibrium level of access whereby an individual has the requisite availability of technology, education/skills, culturally appropriate and relevant content in his/her language of choice – all at an affordable cost. And accordingly, it defines the "access-for-opportunity-divide" as comprising, among other things: income divide, telecommunication access divide, education and skill access divide, language access divide, content access divide and affordability divide.

56 Compare: "We use the term innovation to mean the process that transforms ideas into commercial value. A more systematic definition includes the following: 1. **Introduction and commercial sale**

of a new or improved product, e.g. Pentium chip, Remington typewriter, tungsten filament light bulb, nuclear weapon, hybrid seed, genetically modified food. 2. **Introduction and commercial use of a new method of production**, e.g. Henry Ford's production line, the Pilkington float glass process, Unipol polyethylene process and the steam engine. 3. **Introduction of a new form of business organization**, e.g. franchises, co-operatives, joint ventures and co-production and outsourcing agreements, discount grocery stores, e-businesses, just-in-time manufacturing. 4. **New uses for existing products**, e.g. the electronic computer found its first uses in military applications such as calculating artillery trajectories. Its uses later broadened to include many more applications. 5. **New markets for existing products**, e.g. the donut was invented in Germany and subsequently spread throughout the world. 6. **New distribution channels**, e.g. the internet is a new distribution channel for selling books. We use the term **"innovation system"** to refer to the set of distinct institutions which contribute to the development and diffusion of new technologies in a region. As such, it is a set of interconnected institutions which form a system whose performance is determined both by the individual performance of each institution, but also by how they interact with each other as elements of a collective system." Source: http://www.thecis.ca/definition.htm.

57 Compare: "Institutions are the persistent structures of social life: social roles, legal systems, linguistic forms, technical standards, and all of the other components of the playing field upon which human relationships are conducted in a given society. Central to the institutional approach is an analysis of the relationship between institutions and people (…). Institutions are not external to human affairs; they do not regulate our lives by simply reaching in to intervene. To the contrary, institutions go a long way towards defining us. To see this consider (…) analysis of speech acts. (…) a given utterance does not count as a wedding vow or a jury verdict simply for arranging words in the correct order. These speech acts are not felicitous unless certain institutional conditions obtain, and their result is to create new institutional facts in the world. The institutions, in other words, are constrictive of the acts themselves. The person who performs those acts does so in a particular institutional capacity, as the occupant and performer of a particular institutional role. In relationship to other individuals who are successfully occupying and performing complementary roles. Much of our lives are spent enacting institutional roles, and much of our own understandings of ourselves, and most of others' understandings of us, are bound up with those roles. That is not to say that we are puppets dangling on institutional strings. (…) Nor is it to say that institutions can live on without us. To the contrary, every institution is either reproduced or transformed at every moment through the actions of its participants. The relationship between individuals and institutions, in that sense, is reciprocal." Source: Philip E. Agre, "The Architecture of Identity: Embedding Privacy in Market Institutions, Information, Communication and Society," 2 (1), 1999

58 Compare: "Unless you have a sense, from the inside out, of how the balance is continuously manufacturing non-change, it's much less likely you're going to be able to actually perturb it. Until we have a deep apprehension of the ways in which there's a powerful system holding things pretty much as they are, it's very unlikely that lasting change is going to occur." Source: Conversation with Robert Kegan, Harvard Graduate School of Education, 23 March 2000, accessed at: http://www.dialogonleadership.org/Kegan-1999.html#twelve.

59 This is not a norm though, or structural deficiency. The attainable ideal, as described by E. Hegel [*Philosophy of Right*, Penguin Books, London, 1967] remains attainable: "What the service of the state really requires is that men shall forego the selfish and capricious satisfaction of their subjective ends; by this very sacrifice, they acquire the right to find their satisfaction in, but only in, the dutiful discharge of their public functions. In this fact, so far as public business is concerned, there lies the link between universal and particular interests which constitutes both the concept of the state and inner stability." The too often existing reality is mentioned by Jacques Baudot, ibid: "(…) the State must ensure the protection and security of its citizens, and this includes protection against abuse of power by its own agents."

60 Paul A. David and Dominique Foray (ibid.) take as the starting point the emergence of the knowledge economy and envision such a move in the following way: "The knowledge economy's growth into knowledge society hinges on the proliferation of the knowledge-intensive communities. These communities are basically linked to scientific, technical and some business professions or projects. (…) they are characterized by their strong knowledge production and reproduction capabilities, a public or semi-public space for learning and exchange, and the intensive use of information technologies. (…) Only when increasing numbers of communities displaying those very

characteristics are formed across a wide array of cognitive fields, when professional experts, ordinary users of information, and uninitiated students are brought together by their shared interest in a given subject, will the 'knowledge society' become a reality rather than a vision of a possible future." One would wish that a more direct route could be found.

61 A fine example of such tunnel vision is provided by an ExxonMobile advertisement that reads in part as follows: "Heat. Light. Power. Fuels. It's hard to imagine what modern life would be like without energy. Science finds the natural resources we need. Science retrieves them. Science turns them into energy we all use at the flick of the switch or the turn of the car key. Science, like energy, drives economic growth in the developed and developing world. And as we seek new ways to meet the world's ever-growing demand for energy, it is science that will help us find them. As energy is dependent on science, so science is dependent on scientists. (…) Yet, at a point when experts predict that global energy demand will be 50% higher by the year 2030, the number of young people pursuing careers in science is failing to keep pace with the need for scientists. It's a trend that must reverse. (…) It is a truism that 'young people are the future.' But if we fail to encourage the best and the brightest of them to see their future in science and engineering, what kind of future will it be?" [Report's underlining] Source: *The New York Times*, 30 September 2004.

62 Analysing the issues from an economic perspective, Daniel Bell believes that in post-industrial society technical skill becomes the basis of power and education becomes the mode of access to power. See: Daniel Bell, "Coming of Post-Industrial Society: A Venture in Social Forecasting," 1973, accessed at http://ssr1.uchicago.edu/NEWPRE/POLSOC98/Bell.html. These views are supported by others, e.g. "Of the historical constituents of economic growth, human capital has emerged as the most important. Resource-poor societies have developed it to engineer impressive comparative advantages. The foundation upon which human capital is built must be education, especially early childhood and primary education, where the role of the state is fundamental. (…) Because any social or economic change clearly affects learning, the knowledge societies have to focus on development of human capital. (…) Lifelong learning can instill creativity, initiative and responsiveness in the individuals (…). Donald J. Johnston, "Lifelong Learning for All," *The OECD Observer*, October/November 1998, No. 214.

63 Compare: "An educated society is one that promotes learning as state or level of achievement – usually attained in the first quarter of individual's life. A **learning society** is one whose institutions and organizations foster learning as a way of life [Report's underlining], an activity that continues from birth to old age." Source Donald Lenihan, Jay Kaufman, 2001, ibid.

64 **Machine**: any mechanical or electrical device that transmits or modifies energy to perform or assist in the performance of human tasks. See: http://www.cogsci.princeton.edu/cgibin/webwn?stage=1&word=machine.

65 Today, in the world, it is not being revamped: "The 1990s were a rare decade of reversal in development in too many places. More than 50 countries in the world are poorer now than they were in 1990. The failure of government, and conflict and disease, are the main reasons for this bad state of affairs (…)" Source: David Loyn, "Making a Difference," *BBC World Service*, accessed on 18 November 2004 at http://www.bbc.co.uk/worldservice/trust/2015/story/2004/06/040609_overview_david_loyn.shtml.

66 **"Public"** can mean state-related; accessible to everyone; of concern to everyone; and pertaining to a common good or shared interest. In this particular case, "public" is used as an equivalent of "state-related."

67 Compare: "Certain ideas about equality are woven into the fabric of the liberal state, and quite inseparable from it: first and foremost, equality before the law. But equality before the law, and some other kinds of liberal equality, can be universally granted without infringing anybody's rights. Economic equality cannot. A concern to level economic outcomes must express itself as policies that advance one group's interests at the expense of another's. This puts political and ethical limits on how far the drive for economic equality ought to go. (Strictly practical limits, as well, since too noble a determination to take from the rich to give to the poor will end up impoverishing everyone.) It also means that perfect economic equality should never be embraced, even implicitly, as an ideal. Perfect economic equality is a nightmare: nothing short of a totalitarian tyranny could ever hope to achieve it." Source: "A question of justice?," *The Economist*, 11 March, 2004

68 But economic choices in real life tend to be "menu dependent" (i.e. refer to the "menu" or "opportunity set") rather than to maximization of the value of personal payoff alone. (Amartya Sen, "The Formulation of Rational Choice," *The American Economic Review*, Volume 84, Issue 2, May 1994) In any one decision, people tend to refer not to one single value, conviction or calculation, but to a set of them and they routinely sort out these sets on the basis of a principle that they elect for the occasion. For instance, in a society where public demonstration of greed is not considered *comme il faut*, an apple that is obviously superior to all the other apples in a basket that circulates around the dinner table may not ever be chosen. In such a case, the gratification for all the guests consists of going for sub-optimal choice of the apple (e.g. second best) and assuring social recognition of demonstrated restraint. The principle *comme il faut* that guarantees enjoying benefits (often not material) of belonging to "good society" wins with the principle of instant material gratification.

69 Compare: "People contribute to charities for the homeless, return lost wallets, do voluntary work and tip waiters in restaurants to which they do not plan to return. Both economic rationalism and natural selection offer few explanations for such random acts of kindness. Nor can they easily explain the opposite: spiteful behavior, when someone harms his own interest in order to damage that of another. (…) [The findings of experiments] led anthropologists to conclude that [social] acceptance and rejection were strongly linked to feelings of reciprocity in addition to market benefits. People reward those who act in a cooperative manner and punish those who do not – even if such behavior costs them something personally. (…) In the case of human beings, who (thanks to language) can collaborate in detail, a wide range of group threatening risks – wars, famine, environmental catastrophes and so on – might be susceptible to such collective action. Groups containing strong reciprocators might be better adapted to survive, particularly since their behavior coerces even the selfish into action that favours the common good. Genes for strong reciprocity would thus spread." *The Economist*, 23 March 2002. Thus, we seem to be designed for at least random acts of kindness. The major divide in the cultural war today separates those who see nothing wrong with making these acts more random from those who see many reasons why we should convert the random into semi-permanent.

70 Compare: "(…) if you must be selfish, then be wisely selfish, not narrow-mindedly selfish. The key thing is the sense of universal responsibility; that is the real source of strength, the real source of happiness." Source: The Dalai Lama, "A Human Approach to World Peace," accessed at http://www.peacejam.org/lama/enviro02.html.

71 George A. Akerlof ["The case against Conservative Macroeconomics: An Inaugural Lecture," *Economica*, New series, Volume 46, Issue 183, August 1979] contrasts two approaches to the labour market. First, the **market-clearing model:** "Consider a firm that is paying its labour more than the market-clearing wage. According to the market-clearing model, the firm can and will pay new hires no more than the market-clearing wage. In addition, because it can lay off its existing work force and employ a totally new one at the market-clearing wage, the firm can and will use this threat to force its existing workers to accept a wage reduction." Second, a **model that takes into account other than market-clearing considerations**: "Remuneration policies of corporations are in fact merely parts of elaborate codes of behaviour regarding the reciprocal relations between firms and their workers. (…) If standard business practice prohibits paying market-clearing wages, profit maximization will be inconsistent with wages that are market clearing. (…) Of course, [this] logic can be taken too far. A social custom, or standard business practice, will be violated if it is too costly to obey. Such disobedience will itself tend to undermine belief in the values that uphold the custom. (…) [Cultural factors impact choice of a model. For instance] the American firm tends to uphold wages in recession and lay off workers while the Japanese firm tends to reduce wages, but retain its workers." This confirms the importance of culture and focuses attention on its current shifts, arguably, towards the social understanding and resigned acceptance of the market-clearing model. A Knowledge Economy that operates in a global labour market may see incentives to apply a double standard. The less strict market-clearing model to the "knowledge workers" and the strict market-clearing model, with secondary labour market that offers work, but not jobs, even if salaries are way below the poverty line, to all the others. Elements of such an approach can be detected, though the lure of freedom to apply the market-clearing model only is changing employment conditions for the "knowledge workers" too. The ideological and political propaganda that praises the culture underpinning the market-clearing model as the only viable approach to labour in market economics increasingly makes this acceptable.

72 Addressing this subject, Anthony Giddens in his presentation at the United Nations ("Third Way," A Panel Discussion on 10 November 1998) that was based inter alia on his book *The Third Way* has outlined the "Third Way" agenda: (1) "Big," but "effective" government and responsive political leadership, committed to close partnership with the forces of civil society; (2) reconstruction of the fabric of the civil society, empowering it to assist on issues of major concern, for instance, the fight against corruption and organized crime and the enhancement of civility; (3) "mixed economy" and social markets that make appropriate use of both regulation or intervention and deregulation; (4) reconstruction of the welfare state in which a new balance is found between risk and security; (4) safeguarding the ecological balance that has been in jeopardy through lack of effective government action; (5) a new modus vivendi between, on one hand, local and national government, and on the other, local and international forces; (6) fostering democracy above the nation state. According to him "Equality and individual freedom may conflict, but egalitarian measures also often increase the range of freedoms open to individuals. Freedom (…) should mean autonomy of action, which in turn demands the involvement of the wider social community. Having abandoned collectivism, third way politics looks for a new relationship between the individual and the community, a redefinition of rights and obligations. One might suggest as a prime motto for the new politics 'no rights without responsibilities.' (…) A second precept in today's society should be 'no authority without democracy.' (…) In a society where tradition and custom are losing their hold, the only route to establishing of authority is via democracy. The new individualism does not inevitably corrode authority, but demands it be recast on an active participatory basis. (…) The questions to be asked here are not about social justice, but about how we should live after the decline of traditions and custom, how to recreate social solidarity and how to react to ecological problems." [Report's underlining]

73 Belief that such adjustment is possible was the basis for the **"Global Compact"** initiative proposed by Kofi Annan, UN Secretary-General (Davos, 31 January 1999). The Secretary-General asked world business to: (1) support and respect the protection of international human rights within their sphere of influence; (2) make sure that their own corporations are not complicit in human rights abuses; (3) uphold freedom of association and the effective recognition of the right to collective bargaining; (4) uphold the elimination of all forms of forced and compulsory labour; (5) uphold the effective abolition of child labour; (6) uphold the elimination of discrimination in respect of employment and occupation; (7) support a precautionary approach to environmental challenges, (8) undertake initiatives to promote greater environmental responsibility, (9) encourage the development and diffusion of environmentally friendly technologies.

74 Compare John Stuart Mill, *Principles of Political Economy*, Penguin, 1970: "[the distribution of wealth and resources] is a matter of social institution only. The things once there, mankind, individually or collectively, can do with them as they like. They can place them at the disposal of whomever they please, on whatever terms. The distribution of wealth, therefore, depends on the laws and customs of society."

75 Compare: Such choices are not without consequences. A. B. Atkinson, *Incomes and the Welfare State*, Cambridge University Press, 1995, in a very careful study that was produced before the current "must do" stress on the human factor in development and specifically in transition to the Knowledge Society concludes, "If transfer payments subsidize education, then they raise the rate of growth."

76 Small steps that matter: The city of Curitiba in Brazil can be mentioned here. An analyst explains, "In any context with multiple objectives, the kind of global optimization that traditional economic analysis has assumed as desirable, simply is not feasible, and the constrained optimization or careful calculation of tradeoffs between the objectives found in much urban planning theory probably is not the most important consideration, even where it is feasible. Successful politicians and community leaders recognize this. Some 'second best approach' is required to proceed with urban renewal. It is advantageous to begin with a developmentally oriented, easily communicated vision." (See: Hugh Schwarz, "Urban Renewal, Municipal Revitalization. The Case of Curitiba, Brazil," 2004.) One of the main architects of Curitiba's renewal explains the "vision thing": "No Master Plan, no government plan will succeed without a vision of solidarity. (…) Most important I think is that we always had in mind that humanizing Curitiba was essential. (…) [Curitiba's] public transportation for example is above all, a gesture of solidarity. (…) a social fare was created. (…) [Curitiba] adopted a single fare, in which shorter trips subsidize longer ones (rendering the fare cheaper to those living in the outskirts, typically the poorest.) This is pure income distribution." (See: Jaime Lerner, quoted in above source.)

77 **Public value** refers to the value created by government through provision of services, the passing of laws and regulations and other actions. Only the public can determine what is truly of value to society. In a representative democracy, value is determined by people's preferences, expressed through a variety of means and refracted through the decisions of elected politicians. People's preferences are formed socially: in the family, among friends and in public debate. Citizen engagement in public affairs is desirable precisely because it challenges and changes underlying preferences. The value added by government is the difference between the benefits that the public eventually enjoys and the resources and powers that citizens decide to give to their government. An implicit – and sometimes explicit – contract underlies public value. The legitimacy of government as a whole generally depends on how well it creates public value. The concept of public value provides a yardstick against which to gauge the performance of policies and public institutions, make decisions about allocating resources and select appropriate systems of delivery. For something to be of value it is not enough for people to say that it is desirable. It is only of value if they are willing to give something in return (e.g. taxes, granting of coercive powers, disclosure of private information, time or other personal resources). Public value and ethical values are closely linked. Seen through the lens of public value, the ethos and values of any public organization, service provider or profession must be judged by how appropriate they are in the creation of public value. Inappropriate values may lead to the destruction of public value. Politicians and public agencies can destroy public value for a range of reasons (e.g. poor information about people's preferences, self-interest, rent seeking, capture of public agencies by narrow interest groups and a lack of incentives for public agencies to act efficiently or responsively to the public's needs). Source: Gavin Kelly and Stephen Muers, "Creating public value. An analytical framework for public sector reform," October 2002, http://www.strategy.gov.uk/2001/futures/attachments/pv/public_value.pdf.

78 The current nostalgia for previous non-democratic regimes in parts of Eastern and Central Europe, as well as in South America, can be explained partially by the choices that the democratic governments have been making since the 1990s when the time for cutting public budgets has come. Some of the budgetary outlays that are in the interest of the whole society (e.g. public education, public health care, social security) have been starved of resources and some of the budgetary outlays that are in the interest of groups representing narrow encompassing interest (e.g. tax expenditures, military expenditures) have been sheltered.

79 "Anglo-Saxons for centuries have settled their disputes with their fists (fist fights have long been a part of ritual in English public schools). Eskimos, on the other hand, settle a dispute by one party challenging the other to a satirical song contest. Yet Zunis settle their disputes in a completely different way. In a Zuni village, when two men become angry they get across the road from one another and hurl abuse back and forth, which in most times turns out to be a public attraction. One who wears the other out, wins the dispute." Harvey W. Zorbaugh, "Human Nature," *Journal of Educational Sociology*, Vol. 3, No. 5, Jan. 1930

80 Compare: "Patenting is not the only mechanism that has historically been used to reward inventors for their efforts and to make sure that they reap the fruits of their work and investment. In propositional knowledge, indeed, IPRs are not used and explicitly eschewed. Inventions can be patented, discoveries cannot. The norms of "open science" established in Europe during the Scientific Revolution, meant that contributions to the propositional knowledge were placed in the public realm as soon as they were made. The recognition of a property right (…) meant a citation, but no more. (…) Those who made discoveries that were regarded as particularly useful were rewarded in a variety of ways: medals, pensions, life-long tenured jobs, honorary doctorates, aristocratic titles, and prizes (…) There is no suggestion that there in any proportionality between the magnitude of these rewards and the economic value of the addition of propositional knowledge. Perhaps there should not be: it is society at large that appropriates most of the surplus of new knowledge. All the same, the rate of growth of useful knowledge is sensitive to the incentives to which creative individuals are subject, because on the margin, individuals make decisions on how to spend their lives, and what careers to pick." Source: Joel Mokyr, ibid.

81 Compare: "How should the Canadians understand the commitment to respect diversity in the 21st century? (…) [As] respect through tolerance. In this view, a liberal society must tolerate private beliefs and practices, even when many members regard them as wrong. (…) [As] respect through understanding. (…) People who hold different, even opposing views sometimes recognize that the person whose views they oppose has sound reasons for holding them. (…) [As] respect through

identification. Citizens' personal identities can be viewed as open and dynamic. Individuals can transcend their own cultural experience and become what they are not." Source: Donald G. Lenihan with Jay Kaufman, ibid.

82 Compare: "The point here is not that immigrants, gays or bohemians literally "cause" economic growth. Rather, their presence in large numbers is an indicator of an underlying culture that's open and conducive to creativity." Source: Richard Florida and Irene Tinagli, "Europe in the Creative Age," Software Industry Center, Carnegie Mellon University, February 2004. Their tolerance index comprises scores for attitudes, values and self-expression. It ranks countries in the following order (the focus of the study is on Europe and its comparison with the USA): Sweden, Denmark, Netherlands, Finland, Germany, Austria, UK, France, Belgium, Italy, Spain, Greece, Ireland, USA and Portugal.

83 See also: "Access to information, knowledge and free communication are necessary prerequisites for personal development, individual political participation and the development of humanity as a whole. (…) Freedom of information and knowledge make political decisions transparent, reduce corruption and improve the management of information in public administrations. Secrecy in administrative activities should only be tolerated within narrow boundaries and within a legally defined framework." "Charter of Human Rights for a Sustainable Knowledge Society," Charter Version 2.0, May 2003, accessed at http://www.worldsummit2003.de/en/web/375.htm.

84 Article 12, "Universal Declaration of Human Rights," United Nations, 10 December 1948: "No one should be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks on his honor or reputation. Everyone has the right to the protection of the law against such interferences or attacks."

85 Compare: "It is now commonplace for an individual to be asked to divulge information about himself for use by unseen strangers who make decisions about him that directly affect his everyday life. Furthermore, because so many of the services offered by organizations are, or have come to be considered, necessities, an individual has little choice but to submit to whatever demands for information about him an organization may make. Organizations must have some substitute for personal evaluation in order to distinguish between one individual and the next in the endless stream of otherwise anonymous individuals they deal with, and most organizations have come to rely on records as that substitute. It is important to note, moreover, that organizations increasingly desire information that will facilitate fine-grained decisions about individuals. A credit-card issuer wants to avoid people who do not pay their bills, but it also strives to identify slow payers and well-intentioned people who could easily get into debt beyond their ability to repay. Insurance companies seek to avoid people whose reputation or life style suggest that they may have more than the average number of accidents or other types of losses. Employers look for job applicants who give promise of being healthy, productive members of a work force. Social services agencies must sort individuals according to legally established eligibility criteria, but also try to see that people in need take advantage of all the services available to them. Schools try to take 'the whole child' into account in making decisions about his progress, and government authorities make increasingly detailed evaluations of an individual's tax liability. (…) We live, inescapably, in an 'information society,' and few of us have the option of avoiding relationships with record-keeping organizations. To do so is to forego not only credit but also insurance, employment, medical care, education, and all forms of government services to individuals. This being so, each individual has, or should have, a concern that the records organizations make and keep about him do not lead to unfair decisions about him. In a larger context, [people] must also be concerned about the long-term effect that record-keeping practices can have not only on relationships between individuals and organizations, but also on the balance of power between government and the rest of society. Accumulations of information about individuals tend to enhance authority by making it easier for authority to reach individuals directly. Thus, growth in society's record-keeping capability poses the risk that existing power balances will be upset." Source: *Personal Privacy in an Information Society: The Report of the Privacy Protection Study Commission*, transmitted to President Jimmy Carter on 12 July 1977.

86 Compare: "Four years in the waiting, the Freedom of Information Act has finally come into full force. But will it really change the way journalists find stories and let the public know what is really going on? (…) there will be many situations where public authorities will now be forced to reveal documents on request. This will give British journalists the sort of tool that their colleagues elsewhere have made extensive use of for years. (…) Sometimes Foia will lead to scoops. Sometimes it will just lead to journalists having more background information. The time delays

involved in getting requests dealt with will make it of less use for routine, daily news reporting. But it should be invaluable for longer-term investigations and research. If we had already had freedom of information in Britain, who knows how better informed journalism here would have been on topics like the outbreak of foot-and-mouth disease, Gulf War syndrome, the hospital 'super bug' MRSA or even visas for Filipino nannies. Perhaps we will find out, if journalists decide to revisit some of these stories in search of information which they found it difficult to obtain at the time. (…) But it's not only big national issues which Foia will affect. Since it covers some 100,000 public bodies down to local councils, police forces, primary schools and GP surgeries, it could be that it will be the local media which will get the most out of it." Source: Martin Rosenbaum, "So you want to see the PM's memos?" BBC World News, accessed on January 4, 2005

87 Compare: "The pure interest of the bureaucracy in power, however, is efficacious far beyond those areas where purely functional interests make for secrecy. The concept of the 'official secret' is the specific invention of bureaucracy, and nothing is so fanatically defended by the bureaucracy as this attitude, which cannot be substantially justified beyond these specifically qualified areas. In facing a parliament, the bureaucracy, out of a sure power instinct, fights every attempt of the parliament to gain knowledge by means of its own experts or from interest groups. The so-called right of parliamentary investigation is one of the means by which parliament seeks such knowledge. Bureaucracy naturally welcomes a poorly informed and hence a powerless parliament – at least in so far as ignorance somehow agrees with the bureaucracy's interests." Source: Max Weber, "Bureaucracy," in *Essays in Sociology*, translated and edited by H. H. Gerth and C. Wright Mills, New York, Oxford University Press, 1946 (Wirtschaft und Gesellschaft, *Economy and Society*, 1922.

88 Compare: "The [USA] National Institutes of Health has proposed a major policy change that would require all scientists who receive funding from the agency to make the results of their research available to the public for free. The proposal (…) would mark a significant departure from current practice, in which the scientific journals that publish those results retain control over that information. Subscriptions to those journals can run into the thousands of dollars. Non-subscribers wishing to get individual articles must typically pay about $30 each – fees that can quickly add up for someone trying to learn about a newly diagnosed disease in the family. Although patient advocacy groups and other organizations have been lobbying hard for the proposed shift, the scientific publishing industry and related interests are crying foul. (…) One person who will be celebrating is Debra Lappin of the Open Access Working Group, which has been lobbying for the change. She (…) had been part of a federal study of an experimental AIDS vaccine but had been unable to find out the study's results without paying. 'I paid twice for these results,' she said. 'I paid with my taxes and I paid with blood. I feel like I'm being asked to pay for a third time. I think that's outrageous.'" Source: The *Washington Post*, 6 September 2004, "NIH Proposes Free Access For Public to Research," Rick Weiss.

89 Calls for limiting the private business "chip" abound. "The challenges facing the world today call for improvement in the role of corporate citizenship to promote ecologically and socially responsible operations and development of human and social capital. These factors should become part of a strategy for a better life and a better future. Knowledge is power and it is up to those with knowledge to disseminate knowledge to close the gap between the rich and the poor. The business world, (ICT) companies should play a more effective role as corporate citizens to contribute towards building a knowledge society." Source: Kathia Castro Laszlo and Alexander Laszlo, "Evolving Knowledge for Development. The role of knowledge management in the changing world," *Journal of Knowledge Management,* 2002, 6, 4, p 400. On the other hand, Jim Verdonik ["The necessary secrecy code of successful business execs," *Triangle Business Journal*, 24 September 2004], maintains that "secrets are the secret weapon of most businesses." He names nine areas of vulnerability for business. His remarks are very revealing about the size of the recommended "business chip": (1) Securities: (…) securities laws require companies to disclose material information. (…) it's sometimes perfectly legal for companies to keep material information secret. Advising clients when they have a legal duty to disclose and when they have the right to keep the secret is an important part of being a securities lawyer. (2) Trade secrets: They are often more valuable than patented inventions (…). Limiting trade secrets to a small group of people whose integrity you have verified remains the best trade secret protection. (3) Industrial spying: Having organized programs to unearth the trade secrets of others can be a legitimate business function. (4) Attorney/client privilege: Having your lawyer attend [Board meetings] does not mean people can't be required to testify about what

was said. (…) The corporation is the client and lawyers might have a duty to disclose information provided by officers or directors to that corporate client. (5) Document retention policies: Companies have document retention policies both to retain information and to allow the destruction of information with minimal liability exposure. Using a document retention policy to destroy information during a criminal investigation or civil litigation, however, can expose you to criminal or civil liability. (6) Material agreements in SEC filings: Public companies must file all material agreements with the U.S. Securities and Exchange Commission. This makes them public documents that anyone can see, including customers and competitors. Try to limit the amount of sensitive information your agreements contain. (7) Technology: Changes in technology represent one of the biggest threats to secrets. We all communicate faster, but there is less privacy. (8) Whistle-blowing: Many companies protect their information by having employees sign confidentiality agreements. There is a growing trend, however, in both statutes and courts to allow or require employees to act as "whistle-blowers" to disclose corporate wrongdoing despite confidentiality agreements. (9) Government - Freedom of Information Act: With limited exceptions, any agreement or other document you provide any government agency has to be disclosed by the agency, if someone makes a request under the Freedom of Information Act. Be careful what you voluntarily provide [to the] government.

90 Compare: "There is not much empirical evidence as to how altering the legal conditions and terms of intellectual property rights translates into change in the overall strength of economic incentives for the producers, or about the effectiveness of bigger incentives in eliciting creative results; nor it is a straightforward matter to determine the way in which holders of a particular form of intellectual property right would choose to exploit it, and the consequent magnitude of the resultant social losses in economic welfare ("the dead-weight burden"). Without reliable quantitative evidence of that kind, obviously it is hard to decide in which direction to alter the prevailing policy regime in order to move towards the notional optimum for any particular market." Source: Paul A. David and Dominique Foray, *Economic Fundamentals of the Knowledge Society, Policy Futures in Education* – An e-Journal, 1 (1) Special Issue, "Education and the Knowledge Economy," January 2003. Joel Mokyr, ibid. agrees: "(…) the American system was far more user-friendly than the British patent system prior to its reform in 1852. Yet, despite the obvious superiority of the US system and the consequent higher propensity of Americans to patent, there can be little doubt that the period between 1791 and 1850 coincides roughly with the apex of British superiority in invention. (…) Patenting and IPR were associated with commercialization and the rise of the profit-oriented spirit, but their exact impact on rate of technological progress is still obscure."

91 Shalini Venturelli, ibid. stresses the importance of such variables as "social and economic priorities, and the role of government, reflecting contradictory traditions of regulation, information policy, social models, and political and economic constraints." She believes the approach to e-regulation in the USA is a result of three trends: libertarian model ("information networks of a society are open and non-proprietary, with strict constraints placed on state intervention on any grounds, even for what might be considered entirely rational aims, such as the protection of minors"); public interest model ("application of state power to protect individuals from (…) a threat (…) [of] unaccountable structures of the marketplace"); and liberal market model ("contractual rights and proprietary freedoms for market participants (…); any emergence of monopolies and market distortions would be insufficient ground for inviting state intervention.") She continues: "The economic incentive approach to intellectual property (…) is tilted toward contractual extraction of the property right in ideas and expression, which is of central importance to the content industry, rather than towards public access rights to information or towards author rights of paternity and integrity in their creative works. (…) [The latter] would be seen as burdensome and harmful imposition of public interest obligations on the content industry, which may lead to higher market costs in the development and dissemination of content." The result: preference for self-regulatory industry codes; privileging of contractual law over public law; low threshold for privacy rights; shift in IPR from "fair use" public access model to economic incentives model that favours content industry; unopposed vertical and horizontal consolidation of media, infrastructure, and information industries; lifting most public interest, non-commercial obligations from the content industry, and from the cable and telecommunications infrastructure industries; reaffirming constitutional constraints on content regulation in new media and cyberspace.

92 Compare: "People are bound to turn to a variety of sources to meet their information needs. Various organizations, universities and think tanks, and the private sector will all have a role, as will the

government. In some cases, private sector and other organizations will meet these standards. Peer review processes and a desire to preserve a hard-earned reputation for quality information would ensure that some organizations dedicate themselves to becoming trusted information providers. However, it is unlikely that all people's information needs would be fully met in this way. There are simply too many areas where quality information will be needed, but where reliable providers will not emerge. In such cases, people most certainly will require that the government produce it as a public value. The relevance of public information to people's needs could be assured by perfecting the system for the formulation and expression of people's preferences. And while the rules for the "civil" society and the public space (…) should secure provision in the public domain of information that not only is relevant but true, practical measures supported by appropriate policy and regulations can help to reinforce this. The government can certify information it provides according to well-recognized methodological standards. The release of public information should be de-politicized by removing any possibility of private control over how, when and where it is released. The government should organize itself for the release of information that in its structure does not follow the current organization of public administration by sector, but by outcomes or agreed developmental objectives that serve the adopted developmental goal (e.g. human development). In many cases, this would move the release of information from being misleading by being incomplete to being immediately usable and useful by being comprehensive." Source: *2003 World Public Sector Report: E-government at the crossroads*, United Nations, New York, 2003

93 Compare: "What matters clearly is culture and institutions. Culture determines preferences and priorities. All societies have to eat, but cultural factors determine whether the best and the brightest in each society will tinker with machines and chemicals, or whether they will prefer their swordplay, or study the Talmud. Institutions set the incentive and penalty structure for people who suggest new techniques." Source: Joel Moykr, *The Gifts of Athena: Historical Origins of the Knowledge Economy*, 2003

94 "If we value the pursuit of knowledge, we must be free to follow wherever that search may lead us. The free mind is not a barking dog, to be tethered on a ten-foot chain." Adlai E. Stevenson, Jr. (1900-1965), speech at the University of Wisconsin, Madison, 8 October 1952.

95 This comes back to the question of social acceptance and recognition. Peter F. Drucker ("Beyond the Information Revolution," *The Atlantic Monthly*, October 1999) writes about its importance and uses an example from the time of the industrial revolution: "By the 1850s England was losing its predominance and beginning to be overtaken as an industrial economy, first by the United States and then by Germany. It is generally accepted that neither economics nor technology was the major reason. The main cause was social. (…) England had not accepted the technologists socially. He never became a 'gentleman.' The English had built first-rate engineering schools in India but almost none at home. No other country so honored the 'scientist' – and, indeed, Britain retained leadership in physics throughout the nineteenth century (…). But the technologist remained the 'tradesman.' (…) What might be needed to prevent the United States from becoming the England of the 21st century? I am convinced that a drastic change in the social mind-set is required (…) The key to maintaining leadership in the economy and the technology (…) is likely to be the social position of knowledge professionals and social acceptance of their values. For them to remain the traditional 'employees' would be tantamount to England's treating its technologists as tradesmen – and likely to have similar consequences."

96 This has been for decades the modus operandi of European inteligencia, people from all walks of life, with varied levels of education or income who distinguished themselves as readers of certain journals and participants in casual, social discussions of matters raised in them. It has been part of a way of life, supported by social expectation and approval. Arab tea and coffee houses seem to be playing this role too, as do the qat chewing sessions in parts of Arabia and Eastern Africa.

97 Examples of "dignity-of-creativity-based" activities abound: graphic designs put on clay pottery thousands of years ago, without the intention of raising its market value (those were self-sustainable families and bands of people); a meal uniquely prepared by a housewife for the appreciation of a small circle of family and friends, not with the view of starting a catering business; a "blog" of poems and dreamy images put on the Internet by a gifted student who talks about life and love, for the enjoyment of and comments by her friends and whoever stumbles on it while browsing the net – without copyrights, agents or user fees.

98 Compare: "[The] big problem with the 'digital divide' framing is that it tends to connote 'digital solutions,' i.e. computers and telecommunications, without engaging the important set of complementary resources and complex interventions to support social inclusion, of which informational technology applications may be enabling elements, but are certainly insufficient when simply added to the status quo mix of resources and relationships. (…) meaningful access to ICT encompasses much more (…) [It] is embedded in a complex array of factors encompassing physical, digital, human, and social resources and relationships. (…) What is most important about ICT is not so much the availability of the computing device or the Internet line, but rather people's ability to make use of that device and line to engage in meaningful social practices." Source: Mark Warschauer, "Reconeceptualizing the Digital Divide," accessed at: http://www.firstmonday.dk/issues/issue 7_7/warschauer/.

99 There is agreement among scholars that contexts matter most. To give only two examples: Philip E. Agre in "The Internet and the Political Process" [accessed at http://dlis.gseis.usla.edu/pagre/] writes, "The Internet changes nothing on its own, but it can amplify existing forces, and those amplified forces can change something." Jin Zhouying in "Driving Force of Technology Development – Principles of harmony and balance," [*AI and Society*, Vol. 16. 1 and 2, Springer - Verlag, London, 2002] speaks about the Yin-Yang-like symbiotic, balanced relationship among knowledge, technology, economy and society and argues that it is balance that transforms quantitative into qualitative change. According to her, while technology is a medium of knowledge transfer, it is cultural diversity that facilitates its further transfer into a qualitative resource for creative and innovative applications. Cultural diversity is the living form of tacit knowledge. The tacit dimension reflects the human dimension and is essential for the process of creation, innovation, enterprise and integration of human capabilities. The author emphasizes that technology's applications and impacts can only be determined by the local human condition. One should see the user and the user communities in their multiplicity of roles in communication, interaction and collaboration in local, community, regional and local-global contexts.

100 Compare: "(…) we know that technologies get implemented with particular agendas, with particular social interests. (…) Technology on its own is not very useful, (…) it has to be used to be meaningful and consequential. This view is in contrast to the view that suggests we can understand the value of technology by just assessing its presence through counting the number of machines, or dollars spent on technology. I don't think the question 'what is the return on investment of technology?' is (…) useful. (…) I think we have to be asking 'what is the return on use of technology?' Use is what matters not the mere presence of the technology on my desktop. What I do with the technology makes a huge difference in terms of my productivity and creativity. Technology on its own doesn't help us understand the dynamics of how using the technology enables and constrains particular performance or organizational changes." Source: "Awareness is the First and Critical Thing," Interview with Professor Wanda Orlikowski, MIT Sloan School of Management, 7 September 1999, accessed at: http://www.dialogonleadership.org/interviewOrlikowski.html.

101 "Many (…) regimes translate a long and successful history of control over other information and communication technologies into strong control of Internet development. (…) Through a combination of reactive and proactive strategies, a (…) regime can counter the challenges posed by Internet use and even utilize the Internet to extend its reach and authority." Source: Shanthi Kalathil, Taylor C. Boas, "The Internet and State Control in Authoritarian Regimes," *Carnegie Endowment for International Peace, Global Policy Program*, No. 21, July 2001.

102 Compare: "The issue of e-governance remains a process under development, with innovations being tried in many countries as part of broader reforms of the public sector. The early optimism that Internet would transform the relationship between citizens and the state has been tempered in more recent years by greater skepticism about the power of technology to alter bureaucratic government organizations, deep-rooted patterns of civic engagement, and the structure of the state." Source: Pippa Norris, "Deepening Democracy via E-governance," 2003, unpublished contribution to the *2003 World Public Sector Report*.

103 The methodology for ranking countries in this chapter and for the overall IKS (Index of Knowledge Societies) is explained in the Annex. However, it should be mentioned here that all this measurement effort has been done on an experimental and illustrative basis. Experimental, as while the Report is based on the belief that measuring assets, advancement and foresightedness of Knowledge Societies would be crucial for the discussion of the subject at hand, no one collects global data that address

precisely the phenomena that matter here, e.g. cultural attitudes, level of creativity in school curricula, etc. Thus, proxy indicators have been chosen carefully for the Report. This has been done with full understanding of the difference that separates correlation and causation. The combination of indices in this measuring exercise might change in the future, as more directly relevant data become available. Illustrative, as the existing international statistical databases do not provide comparable information even on these proxies for a larger group of countries than the sample presented. Thus, there is an element of randomness in the choice of the 45 countries presented and that randomness is due to the availability of data for them in all of the chosen categories.

104 A country's investment in education could also be measured by "Education Expenditure," calculated either as percentage of total government expenditure, or as GDP per capita, or per student. The reason why the Report did not choose such a measure is twofold: first, there have been issues of data availability; second, data on education expenditure may be driven by many different aspects of the educational system, including administrative and bureaucratic aspects, which have little to do with actual generation of information or even less with quality of education. Although the situation has been improving in recent years, indicators on education inputs and outputs are unfortunately very scarce and incomplete, thus making it hard to measure one of the most critical features of the advancing knowledge societies.

Part III:
About Smart Knowledge Societies...

Main thought:	To be a Smart Knowledge Society, it is not enough to be rich in main assets and to take care of their development. A new sense of direction in development and a commitment to this new direction must assure high levels of …	
	… quality of life and …	**… safety of life.**
Origins of the main thought:	Mass production of the knowledge "to do"; piling up technological innovations; and converting them into products and services in the framework of the Knowledge Economy managed by the currently existing market does not by itself assure high levels of quality and safety of life for all people everywhere. * The new direction in development can be formulated on the basis of using the technique and means to mass-produce knowledge to turn out and apply the knowledge "to be," to co-exist" and "to maintain developmental equilibrium."	
What to watch?	• "Liveable states" • Culture industry • Locus of decisions about well-being of mankind • Agenda for R&D • Practical uses of the knowledge "to do" • Dialogue on the knowledge "to be" • Principles that govern the moral code for making choices and taking decisions • The fate of the value of human solidarity • Dialogue on the global unifying central cultural thought for humanity • Development of people as citizens • Evolution of the social institution of democracy • Evolution of the social institution of the market	
Proxy measurements suggested by the Report:	• GINI Index • Child mortality	• CO2 emissions • Protected areas

Question 14: What is the knowledge "to do": how can we generate it, use it and benefit from it?

All our lives we are surrounded by things that originate in the knowledge "to do."[105] It is the basis of our material civilization (see Box 14). Indeed, whole periods in human history are named after breakthroughs in our knowledge "to do" that are accumulated and put to practical use. The term "Stone Age" can be used these days to ridicule inferior develop-

ment, but were it not for the stone tools developed several thousand years ago we would not be looking for traces of water and life on Mars today.[106]

Ability "to do" is not unique to people, or even to living organisms. Waves erode beaches; tectonic changes create mountains. Beehives are examples of very advanced engineering. Moles, beavers and birds are excellent builders too. Yet, humans have proved to be both exceptionally creative and learning doers. These abilities have allowed people to claim the capacity "to do" as their own, as a distinguishing feature of homo sapiens.

It is impossible to underestimate the positive impact of the knowledge "to do" on human development. All human capabilities (freedoms) depend to a large extent on practical application of this kind of knowledge. We live longer, more rewarding lives because of them. We would not be able to mass-produce knowledge were it not for the application of technological innovations in the area of ICT, their capacity to impart experience about the "shared spaces for knowledge creation," and the very tangible, physical attributes of such spaces. The whole chain of events that constitute the process of knowledge development in many aspects becomes a reality as a result of practical application of the knowledge "to do."

Having said that, we must admit also that throughout history, and especially in recent times, we have tended to idolize the knowledge "to do" as contained in technological innovations. In prevailing perceptions, it comes to us as an approximation of the elusive truth about the nature of things that humanity continues to chase; and in our minds, its positive effects always seem to outweigh possible drawbacks.[107]

The building blocks…

We know what creates conditions under which the knowledge "to do" flourishes.

Societies recognize the need to educate students, especially in natural sciences, mathematics and engineering and they reward with prestige and money those who decide to devote their capabilities to the study of these subjects. We also know that knowledge "to do," as any knowledge, thrives on active and free exchange of ideas.

Sound markets and sound states that pursue responsible public policies are needed too. Markets channel consumer demand and capital, especially venture capital. States gather revenue and can use it for public investment in education as well as in development of science and technology.[108] They also guarantee the rule of law (needed inter alia for functioning of the markets).

There is empirical evidence that ties it all together. Competitive micro-economy, stable macro-economy, global linkages and investment in people feed off each other.[109]

Last, but not least, "liveable states"[110] constitute the natural home for the Knowledge Societies that develop the knowledge "to do" (as well as all other kinds of knowledge). Through the overall quality and safety of life that they provide, they are able to attract and keep those with high-income potential, i.e. knowledge workers/"mobile taxpayers."[111] All this seemingly awards great advantage to the countries with historically accumulated resources (people, information), enabling institutions, systems and organizations. It also rewards societies in which culture is part of the overall "pro-technology, pro-talent, pro-tolerance" environment.[112]

However, a "liveable" state can also be created almost "from scratch" by appropriate shifts in culture,[113] institutions and public policies. Leadership and public well-informed dialogue in a society are needed to accomplish that. And states can implode as "liveable" spaces, arguably by under-delivery of other than the knowledge "to do" kinds of knowledge. An important caveat relates to public policy of the "liveable" state. Not fewer, but different public policies are called for. They must create institutions that would unlock new sources – for growth in a globally connected economy, and for reaching and maintain-

ing developmental equilibrium throughout the whole society. Choice is possible in terms of institutions and policy instruments. And it must always be remembered that in any community (and this includes “liveable states”), absent governance, absent sound public policies, electronic networks will not reduce economic and social transaction costs but will instead generate more tension, more complexity, chaos and fluidity (C2X).

The future will be marked by competition among “liveable” states, regions and communities for the most creative people with the most developed tacit knowledge. This will be competition based not on skilful advertising campaigns, but rather on mass production and mass utilization of all kinds of knowledge. It will not be a game of copying and adapting, but rather of original creation. Regardless of their current position in the global GDP per capita ranking, societies with rich historical and cultural backgrounds that could interpret these backgrounds in ways that support modern "liveability” look like the most likely winners in this competition.

Eventually the “liveable” state will be populated by increasing numbers of educated, skilled, networked, multi-dimensional, mobile, conscious of their rights, aware of their needs, ready for civic activity citizens/voters/consumers/mobile taxpayers. They will reside in states that also feature citizens/voters/consumers/“captive taxpayers,”[114] i.e. individuals who are relatively less educated, poorer and attached to immobile factors of production, e.g. land, or a business locked within a local market. The fate of the “liveable” state will always depend not only on its sheer ability to attract “mobile taxpayers,” but on the convictions and values embraced by them and supported by the norms and laws of the land. The value of human solidarity and super-encompassing interest would go a long way in allowing a “liveable” state to flourish.

Having said that, it is important to note here that we experience both too little and too much of the knowledge “to do” at the same time.

The deficit of the knowledge “to do”…

The “too little” part is related to the rules that are applied to the distribution of the knowledge “to do” as well as to the selectivity of the knowledge development agenda.

In some sense, there will never be “enough” knowledge “to do.” Physical and social environments change; people and their needs change; human imagination prompts ever-new desires. The goal of greater efficiency remains ever elusive. Human development is not finite. The deficit of knowledge “to do” is therefore endemic.

As long as the main regulating factor in the supply of the knowledge “to do” is the market, this supply will be tied closely to the perfection or imperfection of the currently existing market as a social institution. By and large this works, though the merger of global mega-corporations and the culture industry (with media increasingly owned by global mega-corporations) gives reasons for concern.

If the business of the culture industry is to take people's needs and dreams, process them and sell them back to the people as goods and services, then between the time when the need/dream is expressed and the time when the product/service reaches the market, there is a gap. That gap is often filled with a pure business calculation of profitability.

Modern ICT helps the culture industry with geo-location technologies and personal databases about prospective consumers. As a result, consumers are being deconstructed and reconstructed again and in the end they tend to be offered not only what they thought they needed but also what the computer programmes say it is profitable to sell them. Profitable-for-investors consumer patterns and lifestyles are being promoted globally and imaginative financial instruments seek every penny that is frozen in saving accounts, real estate or individual capacity to borrow and convert assets into consumer purchasing

power. This frenzy is not limited to some of the industrialized countries. Miniaturized packaging is now offering brand teas and soft drinks to the village poor in India. Some years ago they did not even know that they needed them. Today they do, paying a price for the illusion of belonging to the better world of the billboards. This is also the mechanism that causes R&D to eliminate malaria in impoverished regions of the globe to lose *vis-à-vis* R&D focused on ever new beauty aids for urban female teenagers in affluent parts of the globe. And, in this way (an unquestionable masterpiece of the culture industry), overnight a half-truck formerly used for delivery on farms and in the construction industry can become the Sports Utility Vehicle (SUV), a car model of choice for city-dwelling office workers who experience an acute deficit of leisure time and parking spaces and an abundance of traffic jams.[115]

This, of course, is never a one-on-one substitution. But if one stepped back and looked at the totality of developmental needs of humanity and the totality of the knowledge "to do" provided and put to practical use at any given time there would be a worrisome disconnect. The currently existing market is less than transparent and very selective in satisfying the R&D agenda of the people. People's participation in these choices is far from democratic.

Counter arguments are easy, e.g. "Managed correction can come only at the price of curbing freedoms. This has been tried without success in history and has a record of failure."

Let's note though – as mentioned before – that it is in the power of the business community to adjust their business models. Equally, it is in the power of the citizens cum consumers to send strong corrective signals to the business community;[116] and it is in the power of the governments to regulate.[117] This would require a different balance of public power in society. Existing power can be garnished by introducing the criteria of high quality and safety of life to decision-making processes that stand behind the development of the knowledge "to do." We would have to want something else than what is offered to us right now.

Two related issues add to the "deficit" of the knowledge "to do."

One is the above-described effect of intellectual property rights regimes. In their extreme, they keep for long (some would argue, unreasonably long) periods of time in the private domain, important parts of the explicit knowledge related to technological innovations that, if made publicly available, could usefully be converted into "new meaning." Right now, with the reward system for producing knowledge "to do" based on financial gain, recognition and enforcement of property rights in this area is necessary. However, it is worthwhile to stress one more time that alternative reward systems that shorten the legal protection of intellectual property rights would serve the broad public interest even better.

Equally important would be institutional change for dealing with "indigenous" knowledge. Most of the time, such knowledge is far removed from the prevailing channels that put knowledge to practical use on a scale larger than the very local one. Thus, for all practical purposes, this knowledge does not exist. Yet it can be harvested and examples abound of how to do it in an effective way. Sometimes, however, harvesting is done in ways that enclose indigenous knowledge in the private domain, not to make use of it but – worse yet – to prevent it from being used in competition with an already marketed product. When the harvesting of indigenous knowledge broadens its practical use, this is in both the private and the public interest. Finding ways for making it a global public good would serve the public interest even better.

Oversupply of the knowledge "to do"…

The "too much" part is related to the disconnect that may appear between the knowledge "to do" that is being mass-developed and human safety or the safety of life in general. The knowledge "to do," or science for that matter, cannot prove whether something is perfectly safe. Whether we accept tolerating some particular risk too often depends on what the "experts" tell us. Thus "truth" has difficulty in remaining the organizing principle for scientific research and for the development of technological innovations based on the knowledge "to do." Quality of life and safety of life are believed to be superior as organizing principles for mass production and mass utilization of the knowledge "to do."

Of course such concerns would be justified only if we all agreed that human life or life in general is the highest value that trumps all other values – and that the ability of people to reflect and to choose should be employed to protect it. Intuitive as this seems, it does not stand without a contest. People and all their actions can be seen as part of the broader "natural" world. This may justify any human action or behaviour. After all, they all should fit in that broader "natural" environment. Perhaps it is "natural" that people would experiment with the genetic code of living organisms, including humans, without fully understanding the consequences of such actions. Perhaps it is "natural" that people would introduce to the biosphere self-replicating machines with artificial intelligence (AI), and by doing so, open a new man-made evolutionary path in which they will put into contest their own ability to adjust as a species (as compared to the ability of the AI machines to adjust). Perhaps, on planet after planet, life appears and then self-destructs and this is the most "natural" part of the evolution of matter.[118] Or perhaps the most "natural" thing is that people can reflect and choose. There is no one to whom to turn for the answers. We have to figure out all this by ourselves. It would be irresponsible not to do so.

In the meantime, human anxieties and experiences reflected in stories about Prometheus, Pandora's Box, Frankenstein, various incarnations of the Sorcerer's Apprentice or mad scientists give this consideration an age-old context. Today, such anxieties are related to situations in which society allows taking private risks with public well being.[119] Given a situation in which techniques to mass-produce knowledge can also be applied in this area, quite possibly we can be looking at altering Homo sapiens or altering optimal characteristics of the natural environment in which humanity has thrived from time immemorial. For many, human curiosity, the existence of opportunities to experiment, the ignorance or corruption of public decision makers and the quest for profit or even compassion (see Graph 3) seem insufficient reasons for taking such risks.

Of course one can observe as a general rule that mass-applied ignorance is at least as harmful as mass-applied knowledge. But nowadays we often know the odds – and even likelihood – that harm can be done to life as a result of the application of some kinds of the knowledge "to do." The use of nuclear power on Earth or in outer space (e.g. Three-Mile Island, Chernobyl[120]; RTGs to power spacecrafts[121]); location in densely populated regions of chemical plants that process dangerous chemicals (e.g. Bhopal[122]); reliance for energy on burning fossil fuels – all provide examples here. We find ever new ways to produce and mishandle harmful waste.[123] There are also situations in which harm – if it happens – is impossible to handicap, as it would take a long time to become evident. Yet such an uncertain future is being created today without due caution. Pollution of the atmosphere with greenhouse gases; destruction of forests as a result of economic activities; development of synthetic genes; self-replication of living organisms with re-engineered genes or altered genetic composition (and there is nothing "natural" in adding animal genes to plants);[124] or, self-replication of robots, including nanobots[125] (see Box 15) offer a glimpse down this murky avenue. Uncertainty here should constitute invitation to judicial caution and public debate, not to uncontrolled bravado-like investment.

Again, reversal of this trend can hardly be achieved by repressive public policies. Going "off-shore" is the automatic answer, if doing this has economic value. And societies that would establish and enforce such public policies in an arbitrary way do not strike one as spaces for much knowledge production in the first place. Still, a lot can be achieved by well-informed public discussion and resultant public policy that follows corrective reaction from citizens/consumers; or by willingness of the entrepreneurs to change business models.

This should never be interpreted as an intention to freeze (mass-) production of the knowledge "to do." Rather, it is about (1) responsible setting of the research agenda; (2) responsible use of this kind of knowledge; and (3) deciding in whose hands this responsibility should rest: all this with high levels of quality and safety of human life accepted as the guiding benchmarks.

What is needed here is the firm confirmation of the exclusive right of the whole citizenry to taking risk with their future well-being. It is solely the citizenry as a whole – if they so choose – that has the right to invest in development of and the right to use "anything and everything" that can be invented. Private interests are ill-positioned to take such decisions. The big shift here would be from "it can be done" or "it is profitable to do it" to "it is responsible to do it." Privately held power does not equal the right to act here.[126] People's judgements that originate in real-life experiences and people's value commitments expressed in the framework of recognized uncertainty and plurality of legitimate perspectives are better positioned to play such a role.

This shift will not occur without development of citizens and development of democracy. Only mass production of the knowledge "to maintain developmental equilibrium" and use of this knowledge in the political process surrounding R&D choices, along with practical application of the knowledge "to do," can restore the hope of the safety of life. This path cannot be followed in a half-hearted way. Society would have to recognize the seriousness of this debate and invest public money in its support. Quality of publicly available information, quality of citizens' deliberative resources, quality of shared spaces for creation of the knowledge to maintain developmental equilibrium will eventually decide about the results achieved; so will the prevailing quality of the knowledge "to be" and "to co-exist" (see below).

Many may claim, with some justification, that this too is not an error-proof approach. They are scared by the vision of ill-informed mobs making snap decisions, even if these mobs are ICT-literate. Indeed, as explained above, so much has to go right for this approach to work. Half-measures and lip service will not do. But being afraid of the future means being afraid of man. The choice is therefore between trusting humanity with making responsible choices and grave fear that it is incapable of doing this. And on the side of trust, the choice is between "experts" and "citizenry." This Report stands firmly on the side of citizenry.

It helps if this discussion is put in a context. For the past 60 years humanity has lived ("cold war") and continues to live (terrorists, perhaps not exclusively) in fear of nuclear weapons. These products were cleared for research, development and production in the 1940s on both sides of the front line by a small group of experts and politicians. At the time of their development, some experts engaged in the project had calculated and believed that once started, the nuclear chain reaction cannot be stopped, and that the first attempt to trigger it would destroy the universe. Yet, they took this risk on behalf of mankind (scientific curiosity? political pressure? determination stemming from conviction about the lack of humanity of the enemy?). That time, they were wrong: nuclear weapons have produced "only" hundreds of thousands of victims and the ever-lasting fear that con-

tinues to corrupt minds as well as domestic and global politics. What if one day, in a similar situation, they would be right and go ahead and do it anyway – out of scientific curiosity or someone's private quest for wealth or power? From this perspective, does not the idea of global nuclear disarmament continue to look attractive? Or the idea of demilitarization of the seabed and outer space? Or the idea of outlawing the use of all and any technologies as weapons of mass destruction? The future of mankind may hinge on the ability of a well-informed citizenry to provide responsible policy guidance here. Objectively, what has obtained till now diminishes the quality of life and is extremely unsafe.

Historically, society has been adjusting its institutions and organizations to accommodate the specific requirements of technology (sometimes without due attention to what kind of society is has been creating). In ancient Greece, the tension between the new technology of a sea-going ship and society was resolved by setting up an organization based on absolute obedience of the crew *vis-à-vis* the captain. In the face of the treachery of the sea, democracy was put on hold. In modern times, society has organized itself around stockpiles of ABC weaponry and nuclear power plants by setting up elaborate security systems, on the military and on the civilian side. In the face of the danger of mishaps or irresponsible and/or unauthorized use, some human rights and freedoms have been put on hold. It is unfathomable that society would refuse to organize itself to accommodate the challenge of mass-produced knowledge "to do." This Report maintains that the only effective way to resolve the tension between the technology that allows mass production of the knowledge "to do" and society is to develop and deepen democracy.

Box 13

Mass production of the knowledge "to do": top 10 technological breakthroughs of the past 50 years, an American perspective

10. Organ transplants. In 1954, Dr. Joseph Murray removed the kidney from one human patient and implanted it in another. The recipient accepted the kidney as its own rather than rejecting it as a foreign body. It was more than skilful surgery: Murray had chosen a pair of identical twins, Ronald Herrick and his terminally ill brother Richard, in hopes that their similar genetic makeup would reduce the likelihood of Richard's body rejecting Ronald's kidney. Soon afterward, though, other researchers developed drugs that could squelch a transplant recipient's immune system long enough for the new organ to become incorporated into its new body. Today, some 25,000 Americans a year receive a new heart, kidney, liver, lung, pancreas or intestine – and a new lease on life.

9. Robots and artificial intelligence. The term "robot" was coined by Czechoslovakian playwright Karel Capek in 1920 – "robota" being a Czech word for tedious labour – but the first real industrial robot was built in 1954 by George Devol. Five years later, the Massachusetts Institute of Technology founded its Artificial Intelligence Laboratory in a quest to mechanically mimic human minds as well as hands. Today, robots assemble products better, faster and often cheaper than manual labourers, while more than eight million U.S. airline flights a year are scheduled, guided and flown with the superhuman assistance of advanced software. Still, some Americans eye such systems with the cynical view of novelist Kurt Vonnegut, whose 1952 story "Player Piano" warned that the machines might leave people without a purpose – or a job.

8. Electronic funds transfer. The Federal Reserve Bank of San Francisco set up a paperless transfer system with the Los Angeles branch in 1972. By the end of the decade, instantaneous transfers of millions of dollars in value between banks, insurance companies and other financial institutions had become common. The real appeal of EFT today is its trickle down to the individual: You get to grab cash from your bank account anywhere in the world, and use PayPal to buy and sell stuff on eBay without sending money or checks through the mail.

7. Nuclear power. In 1956, when the Queen herself threw the switch on the world's first atomic power plant at Calder Hall in northern England, nuclear reactors were seen as a source of cheap, pollution-free energy. But a partial meltdown in 1979 at the Three Mile Island reactor in Pennsylvania soured Americans on nukes as safe power. Nonetheless, the United States today has about 100 active plants that generate 20 per cent of the country's electricity – second only to coal as a source of power – and have been steadily increasing their capacity. Will the next 50 years bring a better alternative?

6. Mobile phones. The idea for cellular phone service dates back at least to 1947, but the first call was made from the sidewalk outside the Manhattan Hilton in 1973 by Martin Cooper, a Motorola researcher who rang up his rival at AT&T Bell Labs to test the new phone. Thirty years later, more than half of all Americans own one and cellular networks are beginning to serve Internet access at broadband speeds through thin air.

5. Space flight. Americans from 50 years ago would be disappointed to learn we never went further than the Moon – no Mars colony, no 2001 odyssey to Jupiter, no speed-of-light spaceships. Even the Shuttle is in trouble. But the space race against the Russians that dominated the national psyche (and a good chunk of the budget) in the '60s and '70s pushed the development of hundreds of enabling technologies, including synthetic fibres and integrated computer circuits, necessary to fly men to the Moon and back. And the astronauts brought back a lesson from space: "We saw the earth the size of a quarter, and we realized then that there is only one earth. We are all brothers."

4. Personal computers. Before IBM recast the desktop computer from hobbyist's gadget to office automation tool in 1983 – followed by Apple's people-friendly Macintosh a year later – a "minicomputer" was the

Box 13 (cont'd)

size of a washing machine and required a special air-conditioned room. But the trained technicians who operated the old mainframes already knew computers were cool: They could use them to play games, keep diaries, and trade messages with friends across the country, while still looking busy. Today, thanks to the PC, we all look busy.

3. Digital media. "The camera doesn't lie" went a saying not heard much since the release of Photoshop 1.0 in 1990. Digitized audio, pictures, movies, and text let even an amateur edit reality – or conjure it from scratch – with a keyboard and a mouse. A singer's bad notes, a model's blemishes, or an overcast sky in a movie scene can be fixed as easily as a spelling error. Just as important, digital media can be copied over and over nearly for free, stored permanently without fading and sent around the world in seconds. It rightly worries the movie and music industries, but how do you put the genie back in the bottle if there's no bottle anymore?

2. Genetic engineering. Everyone knows Watson and Crick, who unravelled the secret of DNA in 1953. But have you heard of Boyer and Cohen, who constructed the first organism with combined DNA from different species in 1973? They inserted toad genes into a bacterium that then replicated itself over and over, passing the toad's genetic code down through generations of bacteria. Thirty years later, an estimated 70 per cent of processed foods contain genetically modified ingredients, such as soybeans or corn engineered for higher crop yields. Of course, the much bigger potential – good and bad – is in engineering humans. It might prevent birth defects, and diseases later in life. But the side effects could be disastrous and unknown. Is there an ethical way to beta-test human beings?

1. The Internet. This one seems like a no-brainer, but the Net's unique strength is that no two people will agree on why it's so important. The world's largest and most unruly library, it's also a global news channel, social club, research archive, shopping service, town hall, and multimedia kiosk. Add to that the most affordable mass medium ever, and a curse to anyone with a secret to keep. Three-fifths of Americans now use the Net, but it remains to be seen whether the connections to one another will transform us, or prove that we'll never change.

Source: Paul Boutin, a technology writer for *Wired Magazine* and *Slate*, accessed on MSNBC on 25 July 2004.

Box 14

Mass production of the knowledge "to do": Will the future need us?

"Accustomed to living with almost routine scientific breakthroughs, we have yet to come to terms with the fact that the most compelling 21st century technologies – robotics, genetic engineering, and nano-technology – pose a different threat than the technologies that have come before. Specifically, robots, engineered organisms, and nanobots share a dangerous amplifying factor: they can self-replicate.

By 2030 we should be able to build machines, in quantity, a million times as powerful as the personal computers of today (…). As this enormous computing power is combined with the manipulative advances of the physical science and the new, deep understanding in genetics, enormous transformative power is being unleashed. These combinations open up opportunity to completely redesign the world, for better or worse (…)

The dream of robotics is, first, that intelligent machines can do our work for us (…) Yet, in his history of such ideas, 'Darwin Among the Machines,' George Dyson warns: 'In the game of life and evolution there are three players at the table: human beings, nature, and machines. I am firmly on the side of nature. But nature, I suspect, is on the side of the machines.'

A second dream of robotics is that we will gradually replace ourselves with our robotic technology, achieving near immortality by downloading our consciousness. (…) But if we are downloaded into our technology,

Box 14 (cont'd)

what are the chances that we will thereafter be ourselves or even human? It seems to me far more likely that a robotic existence would not be like a human one in any sense that we understand, that the robots would in no sense be our children, that on this path our humanity may well be lost. (…)

Genetic engineering promises to revolutionize agriculture (…), to create tens of thousands of new species of bacteria, plants, viruses, and animals; to replace reproduction, or supplement it with cloning; to create new cures for many diseases, increasing our life span and our quality of life; and much, much more. (…) Given the incredible power of genetic engineering, it is no surprise that there are significant safety issues in its use. (…) Amory Lovins (…) co-wrote an editorial that provides an ecological view of some of these dangers. Among (...) concerns: that 'the new botany aligns the development of plants with their economic, not evolutionary success.'

(…) nano-technology (…) [i.e.] manipulation of matter at the atomic level could create a utopian future of abundance, where just about everything could be made cheaply and almost any imaginable disease could be solved using nano-technology and artificial intelligence. (…) in a world where we had molecular 'assemblers,' [they] could make possible incredibly low-cost solar power, cures for cancer and the common cold by augmentation of the human immune system, essentially complete cleanup of environment, incredibly inexpensive pocket supercomputers (…) space flight more accessible than transatlantic travel today, and restoration of extinct species. (…) Unfortunately, as with nuclear technology, it is far easier to create destructive uses for nano-technology than constructive ones. Nano-technology has clear military (...) uses, and you need not be suicidal to release a massively destructive nano-technological device – such devices can be built to be selectively destructive (…).

An immediate consequence of the Faustian bargain in obtaining the great power of nano-technology is that we run a grave risk – the risk that we might destroy the biosphere on which all life depends. (…) 'Plants' with leaves no more efficient than today's solar cells could out-compete real plants, crowding the biosphere with an inedible foliage. Tough omnivorous 'bacteria' could out-compete real bacteria (…). Dangerous replicators [of all kinds] could easily be too tough, small, and rapidly spreading to stop – at least if we make no preparation. (…) We cannot afford certain kinds of accidents with replicating assemblers.

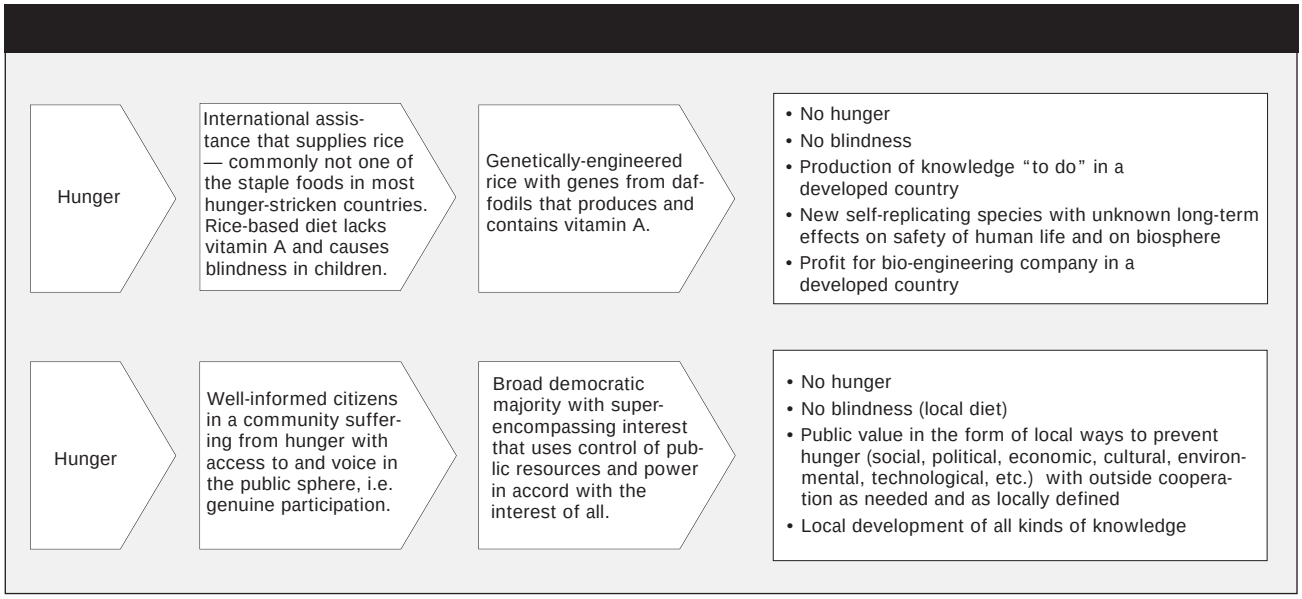
We are aggressively pursuing the promises of these new technologies within the now-unchallenged system of global [market] and its manifold financial incentives and competitive pressures. (…) [We need] awareness of the order of life, and of the necessity of living with and respecting that order. With this respect comes a necessary humility that we – with our early 21st century chutzpah – lack at our peril. The clear fragility and inefficiencies of the human-made systems we have built should give us all a pause (…).

[Today] – unlike during the Manhattan project – we are not at war, facing an implacable enemy that is threatening our civilization; we are driven, instead, by our habits, our desires, our economic system, and our competitive need to know. I believe we all wish that our course could be determined by our collective values, ethics and morals. (…) [Jacques Attali] describes how our dreams of *Utopia* have changed over time: [from] the company of gods and eternity; (…) to liberty (…), to equality. (…) He goes on to describe a fourth *Utopia*, fraternity, whose foundation is altruism. Fraternity alone associates individual happiness with happiness of others, affording the premise of self-sustaining.

Our Western notion of happiness seems to come from the Greeks, who defined it as 'the existence of vital powers along lines of excellence in a life affording them scope.' Clearly, we need to find meaningful challenges and sufficient scope in our lives if we are to be happy in whatever is to come. But I believe that we must find alternative outlets for our creative forces, beyond the culture of perpetual economic growth. (…) [Economic growth] has largely been a blessing for several hundred years, but it has not brought us unalloyed happiness, and we must choose between the pursuit of unrestricted and undirected growth through science and technology and the clear accompanying danger."

Source: Bill Joy, "Why the future does not need us," *Wired Magazine*, April 2000

Graph 3
Technological innovation as a substitute for institutional transformation: an example



Knowledge "to do" and the market…

As a social institution, the market depends on the behaviour of people – on their willingness (or refusal) to repeatedly play the negotiated roles. If consumers changed their minds and refused to buy or investors changed their minds and refused to invest, the market as we know it would implode. If consumers changed their minds and refused to buy certain things or if investors changed their minds and refused to pursue personal gain no matter what, the social institution of the market would evolve.

The market per se does not have an agenda.

It can supply anything, provided there is demand for it.

The acceptable level of personal gain can be culturally determined. As has been mentioned before, at least theoretically, a mix of rewards for being economically active that combines material and non-material rewards (e.g. high social status) can be envisaged.

And loss to society as a whole can be negotiated away provided that an even playing field (i.e. "rock solid" and even floor) for investors exists globally.

Institutional shifts are possible by adjusting the roles currently played by people in the institution of the market. This could happen if the will of the people were to change; they would want to act on this change and would be permitted to do so. It would be a responsible thing to do.

When the market operates in an environment in which mass production and mass utilization of knowledge are possible it can find itself on a collision course with the group(s) with narrow encompassing interest:

First, lack of resources to develop people and information, which prevents the market from having access to the whole pool of people's creativity and tacit knowledge (i.e. the entire potentially available pool of technological innovations) may be unacceptable to

the market. This undercuts the resource base of market operations in the age of knowledge and as a consequence, may hamper growth. Historically, the most rapid economic change has not followed the build-up of financial surpluses (wealth), but periods of innovation, which increase the potential returns from building up financial surpluses.[127] A fully developed (Smart) Knowledge Society carries the promise of a boundary-less period of innovation. This can convert into boundary-less returns.

And second, a too narrow context or too few contexts for the supply of modern ICT-related products and services may be unacceptable for the market. This undercuts profits.

Additionally, even minorities with very narrow encompassing interest may not enjoy the continuous chaos, social strife and disruption that unfinished institutional transformation brings about. They may not enjoy the vision of a dead planet with "WE ARE SO SORRY" ringing in the air as the last gasp of humanity either. They may opt to rethink the nature of their narrowly defined interest and, as some suggest, if they choose to continue to be selfish, they will not do it in a narrow-minded way.

Some futurists[128] do not have such hopes and suggest that, faced with mass utilization in the currently existing market environment of the mass-produced knowledge "to do," people should protect their own species by escaping to other parts of the universe. They forget that what is needed is not a journey in space of human genes contained in several human bodies, but rather a journey within human minds, on the planet Earth and in any part of the universe to which the knowledge "to do" may allow mankind to travel.

* *
*

The issue of the scarcity – and to an even great extent, the issue of the excess – of the knowledge "to do" looms like no other over the question of human intent in life. This question cannot be answered by just mass-producing ever increasing quantities of the knowledge "to do" and delivering its fruits via market to consumers.

We need to broaden discussion of the knowledge "to do" as past experience suggests that production and application of technical innovations solely in the context of economic growth that is managed by the currently existing market sometimes comes with negative externalities that overburden the carrying capacity of people and the biosphere. Putting behind this same institutional arrangement the power to mass-produce and mass-utilize the knowledge "to do" could exacerbate this problem. Simply put, chances are that if the currently existing markets were to manage not the agricultural or industrial economy, but rather, the Knowledge Economy, this would increase the severity of the loss to society as a whole at rates surpassing anything experienced by humanity or the biosphere to date.[129] It is back to the issue of taking private risks with public well-being. The magnitude of the risks is about to increase and the consequences are impossible to handicap.

While individuals feature the survival instinct, larger groups of society have great difficulty with it. Is it possible that people within the social institution of the market would emphasize survival? The Report maintains that it is. The social institution of the market would become one of the pillars supporting the Smart Knowledge Society, a society that features not only an abundance of the knowledge "to do," but also an abundance of all other kinds of knowledge and the great self-correcting mechanism of genuine participation.

Unless, of course, as humanity, we relish repeating our own mistakes and today are comfortable with de facto being engaged in building a new Alexandria.[130]

Box 15

Poverty and social exclusion in the United Kingdom: today

"With the number of people living in low income households on a steady downward trend, the latest figures, for 2001/02, show that income poverty has now fallen below its lowest level in the 1990s. This is a notable milestone, indicative of real and tangible progress.

Out-of-work benefits to both working age families with dependent children and to pensioners have risen sharply since 1999, not just in excess of price inflation but in excess of earnings too. This change, little remarked upon, must be having a significant impact on the severity of the poverty suffered by some very low income households.

The main reason that the number of people living in low income households has fallen is that more people are in work. But the number of people in low income households where someone is in paid work has not fallen. While the latest figures do not yet reflect the full effects of the tax credit system that supplements the money of low income working households, this is a matter of great concern.

In education, earlier progress in increasing the number of children and young adults with an adequate minimum level of qualification has now stalled, with no further advance since 2000, compared with rapid progress during the second half of the 1990s. Around a quarter of young people at each of the ages of 11, 16 and 19 are still failing to reach a basic level of attainment.

There is no sign of any progress since 1997 in reducing the inequalities in health which leave people with low incomes more likely than others to suffer serious health-related problems.

People living in social housing face problems of low income, worklessness and other aspects of poverty and social exclusion on a scale quite different from people in owner occupation.

Across the range of indicators, the problems of poverty and social exclusion are generally more prevalent in the North East than in other areas of the country. London has particular problems centred on low income and work and Scotland has particular problems centred on health.

In summary, the key problems that still need to be addressed include the continuing problems of low pay and disadvantage at work, lack of qualifications, health inequalities and the problems faced by people in social housing."

Source: "Monitoring Poverty and Social Exclusion 2003," accessed at http://www.poverty.org.uk/intro/.

Box 16

Human activity and changes in the biosphere

The scale and scope of human activity have accelerated to the point where they are now having impacts not only locally, but also on a global scale. Unless appropriately addressed, most probably, this level of economic production will not be ecologically sustainable. A tenfold increase in resource use and waste generation would almost certainly stress the earth's natural systems beyond recovery. Fossil-fuel use, agricultural practices, and climate changes, which might produce both rising ocean levels and further desertification, could threaten the very fabric of human civilization. In the last 100 years the composition of the atmosphere has been altered more than in the previous 18,000 years. In 1850 the concentration of carbon dioxide in the atmosphere was about 265ppm (parts per million) and by 1995 it was 359ppm. In addition to this, the methane concentrations have doubled in the last 300 years. In 1990 IPCC predicted that if the present rates of emissions of carbon dioxide continue, the earth will experience a 1C (1.8F) warming by 2030 at the latest and a 3C (5.4F) increase in temperature before the end of the 21st century.

One effect of this rise in temperatures would be to extend the malaria "season" in many countries where the disease is already endemic. Countries most likely to suffer increases in malnutrition in the event of further climate change are India, Bangladesh, Myanmar and Viet Nam, all heavily dependent on a predictable monsoon season for the cultivation of rice crops. Other effects of the predicted shift in climate patterns could be worsening air pollution and allergens – not to mention the likelihood of further "extreme weather" episodes.

Moreover, if current consumption rates continue, all virgin tropical forests will be destroyed within 50 years. This will result in a consequent loss of 50 per cent or more of the world's species. Many indigenous people rely on resources found in the rainforests. They eat the plants for food and use them as medicine. Once those resources are destroyed, they loose their food and their culture, and thus may be forced to find other areas for shelter and food in the protected, endangered areas of forest, leading to further destruction and extinction. The genetic diversity within rainforests provides invaluable additions to the gene pool, which may help to maintain and improve domestic crops. Preserving the rainforest species ensures sustainable development. We use those species for medicines. A large number of species, still undiscovered, might hold the key to fighting present and future diseases. The overall causes and processes of loss of biodiversity have received a lot of attention during the past two decades. The World Resources Institute names among the causes, population growth, increasing resource consumption, global trading systems and failure to account for the value of biodiversity.

Sources: Elfren Sicangco Cruz, "Framework; Corporate vision and the environment," *Business World*, 14 October 2003, p 4; "Climate Change 2001," IPCC *Third Assessment Report*, accessed at http://www.ipcc.ch/pub/reports.htm; "Species Extinction," Rainforest Action Network, accessed at http://www.ran.org/info_center/factsheets/03b.htm; "The Causes and Processes of Loss of Biodiversity," *CIESIN Thematic Guides*, accessed at http://www.ciesin.org/TG/LU/biocause.html.

Question 15: What is the knowledge "to be": how can we generate it, use it and benefit from it?

The knowledge "to be" is about mass-producing "new meaning" that is useful in shaping people's minds. It is about the set of deeply held convictions that constitute the value structure of our existence and the checklist for the choices in life that eventually express themselves as human will. As such, it is also about the culture with which we identify as a matter of birth or choice.

As we have said before, the choices that people make in the pivotal area of development and practical use of the knowledge "to do," especially if put in the environment of the currently existing market, do not always serve the goals of human development or protection of the biosphere (loss to society as a whole). Failure to serve these goals does not happen "by itself." When it does, it means that our deeply held convictions, ergo internal value structure/checklist must be out of synch with them. This concerns both those who control public power in a society and those who formally or informally provide them with feedback about the ways in which they use this power. If we want (need, must obtain) different results, development of the knowledge "to be" is unavoidable.

It is not true that all this constitutes uncharted water in developmental thinking and does not have a place in developmental discussions. To the contrary: the field is crowded with ready-made answers with strong ideological backing. The entrenched opinions are often tied to strong economic or political interests, to say nothing of religious dogmas. It is therefore the depth and strength of the entrenchment, not the subject matter per se that almost guarantees that sailing into these waters would be met with rejection, or as an oddity at best. The risk is worth taking if one attempts to confront the emerging reality in a responsible manner.

The central question of the recent global conference on reducing poverty in the world[131] was: "Why is it that with all the knowledge that we globally have on ways to reduce poverty *[abundance of the knowledge "to do"]* and with all the resources that we have at our disposal *[capacity to put the knowledge "to do" to practical use]* it remains impossible to deliver millions from hunger and abject depravation?" During the conference, this question remained unanswered. There is a wall at which such discussions stop. That wall is built of entrenched convictions, principles and ideas. There may be just enough accumulated evidence and frustration to conclude that these convictions, principles and ideas do not work for the poor and are invoked to hide a very simple reality: collectively, we do not want to do it *[deficit of the knowledge "to be" and "to coexist"]*.[132] Today, throughout the world, at best, attempts are undertaken to "manage" poverty and exclusion. This may not be what the poor and excluded people want.[133]

Some have always dreamed of combining power with goodness, rather than with narrowly defined interest. A participant of another global gathering rephrased this for the age of knowledge as "combining powerful mind and beautiful heart."[134] This brings us back to culture and values and to the human mind that is able to assess the real life situation, identify the key issue for making a choice, reflect on the matter in the context of deeply-held convictions/values and inform the decision making process that leads through human will to action. This is how we make the world around us every day, one choice at a time.

Our existence…

People do exist as a physical body, a mind and – for the vast majority of mankind – as a spirit.[135]

For most, the spiritual part is a matter of belief, not rational, not knowable. Existence of people as spirits is a matter of faith. Predominantly it is reflected in religious dogmas and their accepted interpretations. There are those who equate faith with religious dogma and its prevailing interpretation. There are others for whom faith is a journey and a freedom to seek the Truth[136] and for whom the Truth can be found only within the self. They treat dogma as a historically negotiated understanding of the Truth. They recognize that it is impossible to know the mind of God. Therefore, they recognize that dogmas and their interpretations cannot be the Truth, only its approximation. The humanists among them judge dogmas from the point of view of their support for human development for all. Here, the knowledge "to be" can be useful to help renegotiate parts of the dogmas that can be practiced in ways that de facto deepen social inequity and exclusion.

Such renegotiation would be an intimidating task. On one hand, to say the least, little demand, if any, can be detected for review of dogmas or their interpretations in the major world religions. On the other, at some level, religious dogmas are a source of welcome social stability. If a trade-off exists between equity and inclusion and stability, shifting it around would have to be undertaken with great care.

Yet, historically, religious dogmas and their accepted interpretations do evolve. The accumulated experience of human life – even if seen in religious terms – enriches them. Discoveries in natural sciences pose questions that also must be responded to in religious terms. There is a space for continuous search and for coming closer to the Truth in all religions. This impacts people's convictions, values, and eo ipso culture. There is a space for production (mass production) of "new meaning" in this area and for putting it to practical use. By way of example, if a religious dogma puts people in a superior position *vis-à-vis* all other living organisms, this can be interpreted as a license to abuse or as an obligation to protect and nurture. Depending on interpretation, we can have a culture and community of loggers or a culture and community of careful stewards of nature.[137] This search and this journey (dialogue) towards the Truth may continue.

Both are important, as the idea that human beings exist as spirits has major influence on people's minds, equally for those who believe and those who deny it. The idea ties their behaviour in the physical world to their understanding of their existence in the spiritual world. In this way something not knowable, based on interpretations that do not yield easily to adjustment, constitutes a primary source of the convictions and values that shape human minds, influence culture and direct actions (human will) in our complex, chaotic and fluid world.

The situation is only slightly better on the physical side. The human body has become a subject of study for the natural sciences. Scientists look at it as an object to be studied from the point of view of physics, biochemistry and, recently, genetics. Medicine pulls physics, biochemistry and genetics together. Development of non-medical natural science opens new ways of looking at the physical human body as well.

By now, we understand a lot in terms of the human body's design, construction, functioning and energy requirements. In terms of science we do not know what sparks life; what is the source or nature of the energy that prevents all atoms in the universe, including the atoms in the human body, from collapsing; and we know very little about how the brain works. We know that there is a relationship between mind and body[138] but cannot define it in exact scientific terms. We assume though that all these things – given time and resources – are knowable. This opens the demand for knowledge

"to be" very widely. Mass production of knowledge in this area enjoys broad social support.

The mind is suspended between these two complete or partial (temporary) unknowns. It has a physical address – the human brain – but for many it cannot be easily equated with the physical grey cells in the brain. It has characteristics of the spiritual, as we perceive it. At the same time, it tends to relate very closely to the physical, as we know it. For instance, physical damage of or chemical changes in the brain alter ways in which the mind functions. Self-healing of the body in physical terms can only be explained as the impact of the mind on the physical body, etc.[139]

The question that promises to preoccupy people during this century, as they move to the Knowledge Society, is whether the brain is a processing device, like a PC, for the spirit, or whether the spirit is flesh (see Box 18). What people eventually believe is true will have tremendous philosophical consequences.

Ultimately, people's existence is a moral issue. There is a deficit of will in the world to follow the moral direction as it relates to people's development and co-existence. With the forthcoming discussion of the body-mind-spirit question, this will be affected. Who will participate in this debate and in creation of the knowledge "to be," on what conditions and with what motivation in mind *(excusez le mot)* are therefore very important questions.

Box 17

Body, mind and spirit: a scientific perspective

"What people think about many of the big issues is intimately related to their views on human nature. (…) People see bodies and souls separate: we are common sense dualists. (…) most people think that the soul can survive the complete destruction of the body.

(…) Our dualist perspective also frames how we think about the issues that are most central to our lives. (…) When people wonder about the moral status of animals or fetuses or stem cells, for instance, they often ask: Does it have a soul? If the answer is yes, then it is a precious individual, deserving compassion and care.

(…) Admittedly, not everyone explicitly endorses dualism: some people wouldn't be caught dead talking about souls and spirits. But common sense dualism still frames how we think about such issues. That is why people often appeal to science to answer the question: 'When does life begin?' (…) But the question is not about life in any biological sense. It is instead asking about the magical moment at which a cluster of cells becomes more than a mere physical thing. It is a question about the soul. And this is not a question that scientists could ever answer. The qualities of mental life that we associate with souls are purely corporeal; they emerge from biochemical processes in the brain. This is starkly demonstrated in cases in which damage to the brain wipes out capacities as central to our humanity as memory, self-control or decision making. (…)

Some scholars are confident that people will come to accept the scientific view. In the domain of bodies, after all, most of us accept that common sense is wrong. We concede that apparently solid objects are actually empty space, and consist of tiny particles and fields of energy.

[However] the conclusion that our souls are flesh is profoundly troubling to many, as it clashes with the notion that the soul survives the death of the body. It is a much harder pill to swallow than evolution, then, and might be impossible to reconcile with many religious views. Pope John Paul II was clear about this, conceding our bodies may have evolved, but that theories which 'consider the spirit as emerging from the forces of living matter, or as a mere phenomenon of this matter, are incompatible with the truth about man.'

This clash is not going to be easily resolved. The great conflict between science and religion in the last century was about evolutionary biology. In this century, it will be over psychology, and the stakes are nothing less than our souls."

Source: Paul Bloom, "The Duel Between Body and Soul," *The New York Times*, 10 September 2004

Box 18

Spiritualism: a spiritualist's view

"Within every human being lies a divine energy. This energy has two aspects; one manifests the worldly existence and the other leads to the highest Truth. The mundane aspect of this energy functions perfectly, but the inner aspect is asleep. The goal of the spiritual life therefore, is to awaken to our latent spiritual energy, the source of all happiness. Many people think that happiness comes from outside themselves, in material objects, acquisitions, fulfilment of desires, money, drugs, alcohol, power, sex, etc. [However] happiness lies within us, the closer we identify with the Inner or True Self, Absolute Truth, the happier we eventually become and then we are able to help others, because we now have something vital to give. If more people were to realize their total interconnectedness with each other and everything in creation, then there would be fewer wars, less pollution, and suffering because to hurt someone else or destroy the environment, would be the same as hurting ourselves. The more love, kindness and joy that you give, the more you receive.

Box 18 (cont'd)

Modern science has recently discovered many of the same things that the spiritual masters have known for centuries. The quantum physicists discovered that the world can't be broken down into building blocks of solid matter, existing in a particular time and space. The atom has been seen as vibration as much as particle and these particles are on a fine line between existence and non-existence and can't be said to be present at any particular time or space or not to be present. Matter is made up of energy; and matter, energy, time and space are all one reality called the quantum field. Reality can no longer be viewed as a complex of distinct things and boundaries, for everything and every event in the universe seems interconnected with every other thing and event in the universe. Some scientists have concluded that the quintessential religious experience might be a genuine experience of the universal ground, which science calls the primal energy out of which all creation arises.

Religions originated at different times, places and in different cultures, which accounts for many of the idiosyncrasies in philosophy and dogma which vary from one religion to the next. The experience of the spiritual teachers also greatly affected their followers. The original teachings of these spiritual masters were often misinterpreted by their students and the original message lost or distorted. When this happens the emphasis often shifts from the original essence of the religious teaching to the external forms, the rules, regulations and dogma created by the organization or church. Religion can be a vital guide for helping the individual to explore their True Nature or it can be just another limiting factor contributing towards narrow-mindedness and ego identification. The responsibility for inner growth lies with the individual. One does not need to be religious to be spiritual and a religious person is not necessarily spiritual."

Source: Tom Adams, "Spirituality, religion and science," accessed at: http://64.4.36.250/cgibin/linkrd?_lang=EN&lah=dfe68cffa66be7d1b07e684ef5cc6607&lat=1095705231&hm___action=http%3a%2f%2feasternhealingarts%2ecom%2fArticles%2fSpiritReISci%2ehtml.

Our moral code and its organization…

From the point of view of this analysis it is crucial to understand that the mind collects the guiding convictions and values that relate to both the spiritual and physical existence of people.

And it is equally crucial to understand that in shaping the human will, the human mind is capable of adopting a "double-decker" approach. The convictions and values travel with us on the "bus" of our mind and then in the moment of truth, when the time for reflection and choice comes, we are able to sort them out, leave some on the lower deck, push others to the upper deck, consult the ones on the lower deck only and on this basis form our will and act. In a very broad spectrum of situations this is socially accepted as normal. [This is not to say that there are no situations in which we consult each "deck" or that there are no people who do this all the time.]

Mass development of the knowledge "to be" is needed to find qualitatively new and more compelling reasons (facilitating/organizing principles) why we should put (keep) certain convictions and values on the mental "bus" and how we should sort them out at the "moment of truth." Equally important is to understand the factors that stand behind the social acceptability of the "double-decker" approach. The existing principles are often powerful, time-honoured notions, with a wealth of scholarly arguments as well as traditions and emotions behind them, entrenched in economic and political interests, domi-

nant in the mass media. They function in the society as temporary truths and assure social acceptance of behaviour that, for instance, moves to the "upper not-to-be-consulted deck" – human solidarity in case of market interactions and respect for the humanity of "the others" in the case of war.[140] As a result, public interest is often equated with market outcomes and considerations like justice, equality and solidarity are silenced.

At the same time, people are many-faceted creatures and no one can be interpreted through only one dimension of his/her personality or interest. We tend to label individuals and groups of people too easily, while they most often identify themselves as belonging to many domains of shared interest. Developing the knowledge "to be" is therefore also a search for a new unifying domain of shared interest with which both the members of the controlling group(s) with narrow encompassing interest and the society as a whole can identify. It would be done with the hope that the rationale behind such an all-encompassing domain of shared interest/awareness/understanding/concern would be strong enough to influence practical behaviour in narrower domains that support special interests (i.e. provide a principle for sorting out convictions/values and thus impact human will in the process of making choices and taking decisions).

As pure hope has failed on previous occasions, eventually it will have to lead to negotiation of new power arrangements.

For this, still other kinds of knowledge are needed.

Box 19

What is important to New Zealanders

The Growth and Innovation Advisory Board was established in June 2002 to advise the Prime Minister of New Zealand and senior economic ministers by providing informed perspectives on how the government can best promote its growth and innovation programme. In April 2004, the Board published results of its research on growth and innovation. They are noteworthy.

Three groups of respondents had been questioned: the New Zealanders in general, Maori and the business community. According to the results, in all groups a clear majority of respondents rated as most important for them the following lifestyle and personal factors:

1. Quality of life (93%)
2. Quality of environment (87%)
3. Quality of education (83%)
4. Quality of health care services (78%)

"Potential to increase personal wealth" scored 68% (ex equo with "race relations"); "level of economic growth," 67%; and "business opportunities," 65%.

The report suggests: "Many of those who are pessimistic about the benefits of growth refer to the experiences of the 80s and 90s when they believe there was little or no dividend from the policies of austerity. (…) Respondents identified major concerns in the area of side-effects of growth. (…) [A] number of negative factors were seen as likely to eventuate from economic growth, including deterioration in the balance between family and work life, increased traffic and congestion, a growing gap between rich and poor, more stress and pressure on the average person, a more materialistic culture, damage to the environment and more immigration. (…) Economic growth as a motivating concept for New Zealanders has been weakened by past associations and negative perceptions. It is at its strongest when associated with the achievement of lifestyle, environment, health and education benefits, that is, when it is self-relevant. It is at its weakest when it is perceived as a remote idea with little connection to daily life and shared values – for example [achieving the level of economic growth that would put New Zealand in the] top half of [the] OECD [countries]. A conclusion can be drawn that economic factors alone will not motivate New Zealanders. The country will prosper only if it can create a distinctively Kiwi vision of growth which is meaningful to New Zealanders in the context of their daily lives and the values that they clearly prize."

Based on: *Research on Growth and Innovation*, prepared by the Growth and Innovation Advisory Board, Ministry of Research Science and Technology, New Zealand, 19 April 2004 http://www.giab.org.nz/default.asp?CHANNEL=WORK+PROGRAMME&PAGE=Growth+Culture

Box 20

Is greed good?

"We need more financial abuse – it is a sign that capitalism is working.

(…) the magic of capitalism, as explained by Adam Smith and his followers, is that it channels individual greed into activities that benefit us all. (…) greed is inevitable. It is part of the human condition. And in moderation, economists argue and history demonstrates greed is not a bad thing. Free-market economies could not function if we were all Mother Theresa.

But there is nothing inherent in human condition that keeps greed in moderation. So there are laws and there are appearances. Both these forces draw a rough line – and attempt to police it – between greed that helps other people and greed that hurts other people. And that's a good thing (goes the argument). Why? Because you cannot regulate greed with precision.

Keynes used the term animal spirits to describe the motivation of business people. A stressful economy needs a culture that encourages them. It's a Goldilocks-type situation. You do not want too much greed, and you do not want too little – you want an amount that is just right. But the dials are not at all that sensitive. A culture that encourages enough greed in enough people will encourage too much in a few. If nobody is taking greed too far, you can be certain that too few people are taking it far enough.

[Rigas family, Martha Stewart, Kozlowski, Scott Sullivan] Will no one step forward to say clearly that these seeming malefactors are actually heroes? That we need more of them, not fewer? (…) True, these people may have personally harmed the economy and ripped off many individual investors. Nevertheless, taken together, they are the sign of the economy's robust health. Far better that a few greedheads get carried away than that we be worried that we are not getting the benefit of all the good, healthy, productive sort of greed that this country is capable of producing.

In fact, think of these unpopular figures as canaries of capitalism. They precede us into the coal mine of greed, going father than the rest of us dare, showing us where far enough becomes too far and perishing in the effort. They are martyrs of capitalism, dying financially so that others may prosper."

Source: Michael Kinsley, "In Defense of Excess. Are greedheads a sign of the economy's robust health?" *Time*, 15 March 2004

Question 16: What is the knowledge "to coexist": how can we generate it, use it and benefit from it?

Naturally, the knowledge "to-coexist" is a subset of the knowledge "to be." The Report discusses it separately in view of its importance for the Knowledge Society and in view of its somewhat troubled past and muddled future.

By definition, "the others" are different. They are different, but suddenly they have acquired a new status – that of the main asset of the Knowledge Society. If the Knowledge Society requires that "the others" become part of "us," quite a territory would have to be covered in human relationships and mass production of the knowledge "to coexist" would become quite useful.[141]

Sex, age, colour, ethnicity, culture, religion, language and income distinguish human beings. They make people diverse. As mentioned above, we should respect and cherish that diversity, validate and valuate it. In a world focused on mass production of

knowledge it brings additional value to the main asset of people. Such respect and validation become easier and more likely if the whole diverse group shares the same prevailing goal or value and upholding this goal or value is of utmost importance for that group. Something has to unify those identities and that something must be valued by all.

Currently, we are diverse but do not constitute such a unified group. "The others" are often feared, at best treated as a source of discomfort. What is worse, historically but also contemporarily, political leaders and "moral" leaders do not hesitate on occasion to accentuate the existing differences in the power game for political gains. The vicious circle of stressing the superiority of one's identity, depicting the others as inferior and dangerous deviants, instilling fear of them, and dehumanizing them – all lead from orthodoxy to fundamentalism, radicalism and too often, violence. Such experiences linger in people's memory for long periods of time (on occasion for hundreds of years). The commonality of parents wishing a better future for their children on both sides of the income divide is not recognized. Nor is the commonality of mothers grieving the death of their sons on both sides of the front line in a war.

Yet, as a rule, our minds are filled with all the needed, accommodating convictions and values. In many different languages in many different phrases, on the basis of many different illustrative stories we are taught not to harm others. These positive messages contain notions of mutual respect and love. To revisit the analysis of the previous chapter, too often strong facilitating/organizing principles push them to the upper level of our mental "double-decker" and lock them up there.

As if that were not enough, the question of the human relationship with the biosphere does not want to disappear from the developmental agenda either. This Report raises it as one of the key concerns in the age of knowledge, mainly as a result of the yet untested, though potentially unprecedented, negative impact of some uses of the mass-produced knowledge "to do" on the carrying capacity of the biosphere. This may look like rehashing very old arguments,[142] but this time there promises to be a sense of finality.[143] It simply defies common sense to maintain that we are having and will forever continue to have a free ride – that the biosphere will always accommodate whatever alteration to it we can think of and whatever pace of alteration we can achieve.

And, if even that were not enough, the knowledge "to do" creates for us situations in which, perhaps during the lifetime of today's teen-agers, we may live alongside hybrids of genetically re-engineered human beings and machines; or machines with high levels of artificial intelligence. As far as the United Nations Universal Declaration of Human Rights is concerned, at what level of genetic intervention or supplementation of the human body and human mental capacity with mechanic or chemical implants would the resulting being stop qualifying as a subject of the Declaration and accompanying conventions? At what levels of sophistication would robots with artificial intelligence start qualifying as subjects of this Declaration and accompanying conventions? What about human clones? What about a CD with a complete digital record of our mind, if the knowledge "to do" makes this possible (if it does not, it will not be for lack of trying)? Will robots always be programmed as inferior to human beings (why?) and not capable of harming human beings (why?)? To push this envelope even further, for what or for whom will we be organizing a birthday party in the future? Should we programme robots with high levels of artificial intelligence to meditate? Why not? Or should the knowledge "to be" draw firm lines to prevent genetic human re-engineering, cloning or turning out self-reproducing robots with high levels of artificial intelligence? Why? Will we be inviting human clones and robots with high levels of artificial intelligence home for dinner? Or human clones only? The belief that all this will remain forever the stuff of sci-fi novels and enter-

taining movies would gravely underestimate the power of utilization of the mass-produced knowledge "to do," just as happened when Jules Verne first dreamt about a voyage to the Moon. Do we want our knowledge "to push the frontier" and would we welcome it if that were to happen? If so, then the knowledge "to coexist" may become the most important kind of knowledge to mass-produce in the future.

Or is it that we do not want it? Then, we need a rapid development and practical application of the general knowledge "to be" and adjustment of the facilitating/organizing principles for our convictions and values so that while reflecting and making choices in this area we feel empowered and do not succumb to the false notion that "this is the natural course of things and we cannot do anything about it." We always can. Up to the last millisecond before the decision is made, we have the freedom of choice.

* *
*

Coming back to sorting out issues in the human family, from some points of view, what is being emphasized in the Age of Knowledge looks promising. People are being elevated to the position of the main assets and thus human solidarity, human development and validation of diversity should be brought back to the lower level of our mental "double-decker" and guide our choices, will and actions. As mentioned before, even the market should be on the side of this change as leaving no creative capacity or tacit knowledge behind would maximize the opportunities to turn out profit. The need to maximize production of knowledge should act as the predominant facilitating/organizing principle. In such a world, troubles with coexistence would surely become matters of the distant past. Or would they?

They would not if human creativity and tacit knowledge would start to be treated, for example, as crude oil – a deposit of a useful resource, to be controlled in its totality, but used on an "as needed" basis. Do we really need all six billion – or in the not-so-distant future eight billion – minds engaged in creative reflection today, this very moment, busy creating "new meaning" whether there is capacity to put it to practical use or not? Or is it enough to establish a "creative class" and expand or shrink it as the business cycle would dictate?

There is no need for such an approach. Human creativity and tacit knowledge are not finite resources. No one can predict whether a selected group of people is capable of turning out needed "new meaning." Any restriction is bound to carry the risk of excluding the most creative minds.

Not needing something does not guarantee not having it. Legacy facilitating/organizing principles may linger and effectively support legacy social structures. The effect of the missing pool of creativity and tacit knowledge may not be easily detectable – after all, the active one would be very visibly bigger than ever and we have grown accustomed to living alongside and often in the midst of the "underclass." A new exclusion is possible in the Age of Knowledge. In moral terms this one would be the cruellest yet, as it would deny the opportunity to develop and practice the very core of what makes people human – the freedom and the capacity to be creative. However, moral appeals have not yet sorted out the quagmire of coexistence. Even if supported now by the argument of wasting human minds, the most precious asset for growth and development, they may still under deliver.

As mentioned above, groups tend to change the nature of relations among diverse sub-groups and diverse individuals and to respect and value diversity when they

accept a common goal or vision. Hence, an important part of mass production of the knowledge "to be"/"to coexist" would be to establish such a shared goal or vision, to come up with the unifying central cultural thought for humanity.

Question 17: What central cultural thought?

The goal of "high level of quality of life for all" presently functions universally, but only as a manifesto construct. We would need a central cultural thought to put coherent implementation machinery behind it.

As a theoretical concept, the premise of a central cultural thought is attractive. It would have to have at least two features: simplicity that expresses the very core of human existence; and attractiveness that convinces and unifies. It would also have to be behind outcomes that are beneficial to all or at least to a vast majority. Then the task of rearranging the social institutions of the Knowledge Society would suddenly become easy (see Graph 3):

> The central cultural thought would be the source of the facilitating/organizing principles that sort out convictions and values on the mental "double-decker."
>
> On the strength of universal acceptance of the central cultural thought, those facilitating/organizing principles would be strong enough to withstand competition from rival principles that might be lingering on from the past or could appear over time.
>
> This would open space for the knowledge "to be"/"to coexist" to go into the mass production mode, debate dogmas and ideologies and their interpretation and practice, and come up with new or reinterpreted convictions and values – all in the safety of the realization that the prevailing facilitating/organizing principles would manage to direct them to a proper deck on the mental "double-decker," or to destroy the "deck" altogether.
>
> Via reflection in the process of formulating human will, the human actions directed by this will would achieve an acceptable level of quality and safety of human life. Specifically, this would establish the parameters for mass production of the knowledge "to do."
>
> As no administration, enforcement apparatus or means of violence would support this structure (it would stand on universal human acceptance only), it would never petrify. Information about the real level of quality and safety of human life would be creatively reflected upon and – in case of discrepancy between the goals and the reality – "new meaning" would emerge and adjust the central cultural thought and the whole sequence depending on it.

Right now, we do not have a unifying central cultural thought for humanity.[144] Coming up with it remains as elusive as coming up with the unifying force theory in physics. Without it, we continue to live in a world of "want to be" competing central cultural thoughts. This results in a squabble at the level of the facilitating/organizing principles. We have experience with the principles, which for whatever reason have managed to prevail in shorter or longer periods of time and play havoc on the "double-decker," with all the ensuing consequences. For now, we accept living in this imperfect world as long as we are convinced that it is inching in a more perfect direction. The reason for the emerging concern is that mass production of knowledge would not tolerate this snail-like pace of institutional changes, even if they are for the better. If we do not assure a balanced move

forward and allow one of the wheels (e.g. that of the knowledge "to do") to spin much faster, as on a road in real life, there is a danger – even a probability – of a very wobbly, uncomfortable ride and eventually even of a crash. The Knowledge Society that takes such risks would be unsafe by design.

A short, illustrative review of ideas that could or do vie for the position of the central cultural thought illustrates how elusive this goal is.

Monotheism: It has everything that one could desire in the unifying central cultural thought. As applied, though, it has proven neither universal nor unifying. Historically, in its often practiced extreme, intolerant interpretations, when translated into prevailing facilitating/organizing principles, it has tended to produce divisive fundamentalism, radicalism and merciless violence. As a result, it has been contested as a source of facilitating/organizing principles and competes for impact.

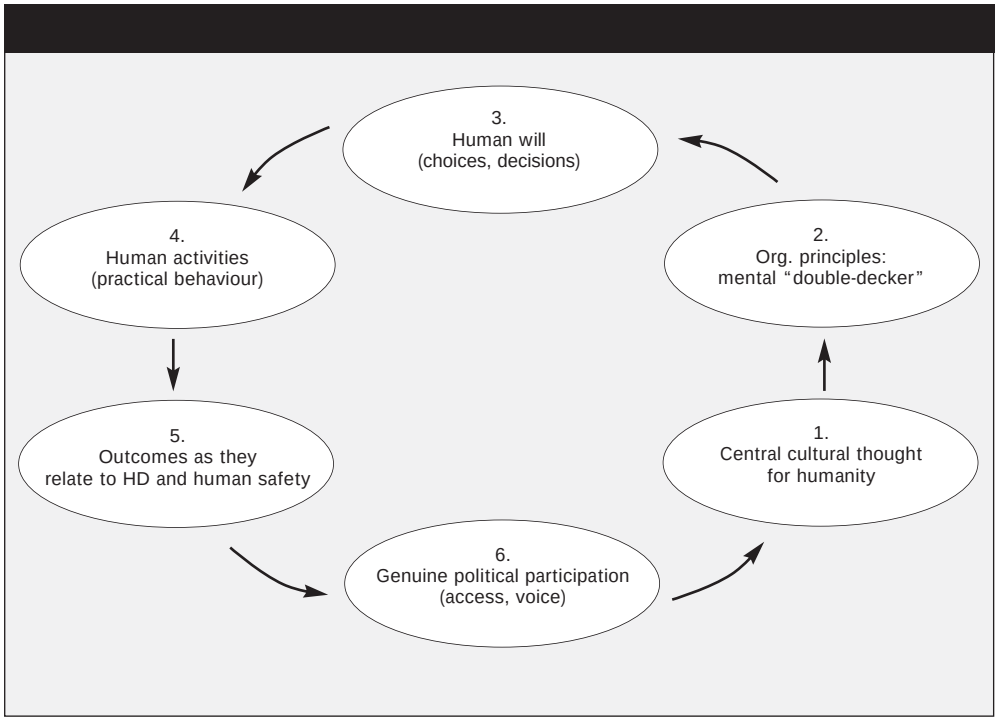
Mutual respect for the humanity of all people everywhere: It has strong spiritual and intellectual roots. It represents the best of humanism. It is recognized universally as a manifesto precept. It does not relate directly to the biosphere. Weak real life support results in facilitating/organizing principles that lose out in rivalry with others.

Transcendence: It is a renewed effort to come up with a unifying approach. It speaks to the best in humanism and environmentalism and seeks justification in the supernatural. In fragments, it exists in many religions and ideologies and as such is accepted as part of them. By itself, it is not a household name yet and therefore does not represent real power in the squabble of facilitating/organizing principles.

Freedom, as enshrined in market economics and democratic politics: By itself, the idea of freedom is one of the greatest motivators of human behaviour. Throughout history, people have been ready to die for it. They are imprisoned and die for it today. As a concept, it has had a somewhat disappointing history of development, interpretation and application. As embodied in the currently existing market economics and democratic politics, it has emerged as the winning combination of ideas that evolved during the ideological and political clashes of the 19th and 20th centuries. The facilitating/organizing principles rooted in it prevail in most of the world. It plays de facto the role of the central cultural thought. But if we look at the history of the 20th century, arguably the century in which societies attempted to organize around this combination of thoughts, that history can be written also as a history of three deepening rifts: between people and nature; between the centre and the peripheries of social structures; and between matter and mind (that which is material and that which is not material). We live in a world in which nature, the peripheries of social structures and mind (the non-material) seem to have taken a very distant back seat. It is certain that organizing the Knowledge Society along the same principles can only deepen these rifts. There are clear dangers related to bringing the power of unbalanced, heavily-skewed-in-one-direction (e.g. knowledge "to do") mass production and mass utilization of "new meaning" into this context without adjusting it. That is why, at the time when it is generally appreciated as the best of the now available ways to organize for economic and political activities, this combination of ideas is under contest in its de facto position as the central cultural thought.[145]

Massive creation of the knowledge "to be" is needed.

Graph 4
The "virtuous circle"



Box 21

Transcendence

"The dizzying development of (…) science, with its unconditional faith in objective reality and its complete dependency on general and rationally knowable laws, led to the birth of modern technological civilization. It is the first civilization in the history of the human race that spans the entire globe and firmly binds together all human societies, submitting them to a common global destiny. It was this science that enabled man, for the first time, to see Earth from space with his own eyes; that is to see it as another star in the sky. At the same time, however, the relationship to the world that the modern science fostered and shaped now appears to have exhausted its potential. (…) It produces what amounts to a state of schizophrenia: Man as an observer is becoming completely alienated from himself as a being. (…) This state of affairs has its social and political consequences. The single planetary civilization to which we all belong confronts us with global challenges. We stand helpless before them because our civilization has essentially globalized only on the surfaces of our lives. (…) The end of the era of rationalism has been catastrophic. Armed with the same super-modern weapons, often from the same suppliers, and followed by television cameras, the members of various tribal cults are at war with one another. (…) The (…) world of the past decades has collapsed, and a new, more just order has not emerged yet. The central political task (…) is the creation of a new model of coexistence among the various cultures, peoples, races, and religious spheres within a single interconnected civilization. (…)

The idea of human rights and freedoms must be an integral part of any meaningful world order. Yet, I think it must be anchored in a different place, and in a different way, than has been the case so far. If it is to be

Box 21 (cont'd)

more than just a slogan mocked by half the world, it cannot be expressed in the language of a departing era, and it must not be mere froth floating on the subsiding waters of faith in a purely scientific relationship to the world.

Paradoxically, inspiration for the renewal of this lost integrity can once again be found in science, in a science that is new – let us say postmodern – a science producing ideas that in a certain sense allow it to transcend its own limits. I will give two examples:

The first is the Anthropic Cosmological Principle. Its authors and adherents have pointed out that from the countless possible courses of its evolution the universe took the only one that enabled life to emerge. This is not yet proof that the aim of the universe has always been that it should one day see itself through our eyes. But how else can this matter be explained? I think the Anthropic Cosmological Principle brings to us an idea perhaps as old as humanity itself: that we are not at all just an accidental anomaly, the microscopic caprice of a tiny particle whirling in the endless depth of the universe. Instead, we are mysteriously connected to the entire universe; we are mirrored in it, just as the entire evolution of the universe is mirrored in us.

Until recently, it might have seemed that we were an unhappy bit of mildew on a heavenly body whirling in space among many that have no mildew on them at all. This was something that classical science could explain. Yet, the moment it begins to appear that we are deeply connected to the entire universe, science reaches the outer limits of its powers. Because it is founded on the search for universal laws, it cannot deal with singularity, that is, with uniqueness. The universe is a unique event and a unique story, and so far we are the unique point of that story. But unique events and stories are the domain of poetry, not science. With the formulation of the Anthropic Cosmological Principle, science has found itself on the border between formula and story, between science and myth. In that, however, science has paradoxically returned, in a roundabout way, to man, and offers him – in new clothing – his lost integrity. It does so by anchoring him once more in the cosmos.

The second example is the Gaia Hypothesis. This theory brings together proof that the dense network of mutual interactions between the organic and inorganic portions of the earth's surface form a single system, a kind of mega-organism, a living planet - Gaia - named after an ancient goddess who is recognizable as an archetype of the Earth Mother in perhaps all religions. According to the Gaia Hypothesis, we are parts of a greater whole. If we endanger her, she will dispense with us in the interest of a higher value – that is, life itself. (…)

Yes, the only real hope of people today is probably a renewal of our certainty that we are rooted in the earth and, at the same time, in the cosmos. This awareness endows us with the capacity for self-transcendence. Politicians at international forums may reiterate a thousand times that the basis of the new world order must be universal respect for human rights, but it will mean nothing as long as this imperative does not derive from the respect of the miracle of Being, the miracle of the universe, the miracle of nature, the miracle of our own existence. Only someone who submits to the authority of the universal order and of creation, who values the right to be a part of it and a participant in it, can genuinely value himself and his neighbors, and thus honor their rights as well.

It logically follows that, in today's multicultural world, the truly reliable path to coexistence, to peaceful coexistence and creative cooperation, must start from what is at the root of all cultures and what lies infinitely deeper in human hearts and minds than political opinion, convictions, antipathies, or sympathies – it must be rooted in self-transcendence:

- Transcendence as a hand reached out to those close to us, to foreigners, to the human community, to all living creatures, to nature, to the universe.
- Transcendence as a deeply and joyously experienced need to be in harmony even with what we ourselves are not, what we do not understand, what seems distant from us in time and space, but with which we are nevertheless mysteriously linked because, together with us, all this constitutes a single world.
- Transcendence as the only real alternative to extinction."

Source: Vaclav Havel, "The Need for Transcendence in the Postmodern World," accessed at http://www.worldtrans.org/whole/havelspeech.html.

Question 18: What is the knowledge "to maintain the developmental equilibrium"[146]: how can we generate it, use it and benefit from it?

Developmental equilibrium is a way in which a society may choose to organize itself for human development.[147] It can be achieved by the use of public resources to allow the production of public value in ways that minimize costs and maximize benefits for all the interest groups in the whole society. [As mentioned earlier, this Report maintains that markets can clear within the overall public value framework of high quality and safety of life and in this way support it.]

This can be done on the basis of a broad consensus reached through well-informed, free, open and accessible public debate and decision making in which the interest of the majority (ideally, the interest of the whole society) prevails. When, after elections, we proclaim, "The people have spoken," it makes a huge, decisive difference whether we refer to superbly well-informed, free and eager-to-debate citizens with access to and voice in the public sphere, who have voted, or speak about an uninformed public that has been manipulated during the election time and believes that democracy equals elections. Voting alone – one of the many rituals of democracy – should never be mistaken for democracy itself.

We have always wanted to achieve developmental equilibrium. That is why we have invented the democratic political process[148] to negotiate the differences in the interest of a majority or – even better – in the interest of all. We rarely get it though. Now, we are able to determine that we need more of it. Under-supply of the developmental equilibrium may slow down development of the Knowledge Society (through under-development of people and information; under-supply of opportunities to mass-produce knowledge of all kinds; oversupply and over-use of wrong kinds of knowledge) and produce a Knowledge Society that is warped.

Till now, we have talked about rethinking perceptions and priorities, e.g. poor people perceived no longer as dangerous deviants, but rather as assets; scientific research and knowledge "to do" not in pursuit of "truth," but rather in pursuit of high quality and safety of life; democracy that delivers public value and the market that gives up the license on production of the loss to society as a whole, etc. A balance is needed as, for instance, while no one wants the knowledge "to do" to run amok in disregard of high quality and safety of life, at the same time, no one should want an ascetic society that gives up on the knowledge "to do" and wrecks mechanisms that can efficiently and effectively put it to practical use, e.g. the market.

All this constitutes a mix of often-conflicting interests. It involves complex and important choices and decisions. It is not irrelevant for the outcomes how and by whom they are made. Additionally, finding the developmental equilibrium is not an exact science. It is a game of continuous approximations and adjustments. Translating it into the language of real life, we are talking eventually about the timeliness and quality of public policies that are informed by knowledge generated within the political process.

Mass-produced "new meaning" as an engine of genuine participation

It would be back to the familiar theme of governance via genuine participation if not for the qualitative change that is now possible. The political process can now be considered as one more locus for knowledge creation and can benefit from the ability and

transformative potential to mass-produce "new meaning." It can enlarge to mega-scale and result in a dramatic, positive shift in quality and effectiveness of political participation.[149] If as a society we organize for it, we all can manage our private time in such a way as to become "five-minute politicians" or "full/part-time politicians" along with our other jobs and interests in life, and do this very effectively. This would be made possible by assuring a steady flow in society of high quality information, including through mass media that serve the public interest; building up developed citizenry; rule of law that protects civil rights and freedoms (i.e. open and accessible public sphere[150] in which social inequalities of status do not exist); and attentiveness and responsiveness of the government.

Lest this argument be hijacked and ridiculed as a quest for one big continuous political jamboree with endless debate involving all citizens all the time and a very slow decision making process, it is important to stress that we are talking, rather, about very practical things, e.g. shorter and more guarded suspension of judgement *vis-à-vis* authority by the citizens; and about deliberative spaces within and between political organizations that are ubiquitous and formalized in ways that make voice much easier and much more egalitarian.[151]

In this context, some speak about "weak" and "strong" publics,[152] with the former playing the role of just "keeping the conversation going,"[153] but without direct, immediate impact on decision making, and the latter capable of real impact on decision making and holding the government accountable (e.g. legislative bodies). Even if we were to adopt this assumption as a more truthful characterization of reality than Haberman's "one" public sphere, it is easy to see that the profusion of the "weak" publics would make the "strong" publics stronger and as a general rule, it is the absence of the "weak" publics that allows the "strong" publics to veer off the public interest so easily.[154]

In case "strong" publics do not deliver, the "weak" publics can evolve in their functions and step into the traditional role played by established democratic institutions and organizations. Therefore, the conflict here is not between direct and representative democracy. Rather, it is between democracy that rests on consent of the ill-informed, often misled electorate and democracy that rests on consent built during the process of well-informed deliberations among citizens actively involved in mass production of the politically useful knowledge "to maintain developmental equilibrium." The latter stands a better chance of supporting production by the government of public, as opposed to private, value. The choice is the politicians' to make. They can embrace transformations and changes that will allow the ICT-supported growth of domains of shared interest throughout the society and treat them as helpful factories of politically useful "new meaning." Or they can oppose such transformations and changes. What is in the balance, ultimately, is the will to amass public power in order to construct and secure the space for limitless development of people and information as well as mass production of knowledge of all kinds, eo ipso the future of a society as the Knowledge Society that pursues high quality and safety of life.

As stated at the beginning of the Report, living in such a Knowledge Society is in the interest of the whole society. Minorities with narrow interest are not likely to organize a society for this transition as it would require a shift of power away from them. It would take a democratic majority with super-encompassing interest to do so. Building such a majority, informing it about the developmental options in a balanced way and then holding it accountable are tasks that must be supported by a well-informed, organized, active citizenry. Developmental balance suitable for the Knowledge Society will not be supplied by accident or as a benevolent gesture by an autocrat. It must be demanded by the citizens and then protected by them on a continuous basis.

Shifting expectations and new opportunities

Throughout the world, the dream of transparency for the sake of holding governments and business firms accountable has not yet been realized. But we are talking here about leapfrogging this stage and building institutions that would make the volume and quality of available information suitable not only for accountability (important as it is), but first and foremost for producing throughout society, "new meaning" that is politically useful. Access to the public sphere and voice in the public sphere would supplement mere transparency as the main demand, locally and internationally.[155]

Throughout the world, the dream of responsive government and a responsive business community has not yet been realized. But we are talking here about leapfrogging this stage and building institutions not only for sending up taxes and expressions of preferences (in the case of government) or sales receipts and expressions of preferences (in the case of business), both with the hope of responsiveness, but first and foremost about sending up offers of partnership on the basis of locally developed and available, politically useful knowledge. What will be needed ultimately will not be just "responsive" government and business, but government and business that link up with the citizens and consumers in creative networks for the sake of decision making and producing public value.

However, the most significant institutional change would originate from the very core of our understanding of the Knowledge Society, i.e. the conviction that people are its main assets. If for the society as a whole this means protecting, developing and nurturing people, in the case of development of politically useful knowledge this would mean protecting, developing and nurturing people as citizens. In this way we would move to the third wave of building governance systems: from fixing policies and institutions in the past to development of the citizenry and re-engineering of civil society in the future. This must involve shoring up a broad range of human capabilities and it would be a daunting task as its goals would be counterintuitive, as compared with legacy systems and patterns of behaviour. Again, the necessary change goes way beyond the usual mantras of civil rights and political freedoms (crucial as they are). A developed citizenry must result from the philosophy and achievements of the Knowledge Society as a whole.

Social acceptance, positive signals and a system of rewards that would encourage creativity in general would have to expand to the political sphere. In many environments, this would be an important cultural change. Creativity in this area means a license to creatively politicize issues: at home, in the place of work, in the place of worship, in the community, in the world – all from the comfort of one's own private zone for creative reflection on available information. Not only would the quality of information have to improve dramatically, but the flows of information would have to be re-channelled. Politicizing issues is not generally welcomed. Right now, if it is done, society attempts to limit it to selected moments in time, institutions, and levels of social hierarchy, age or gender. We would have to imagine and then put in place a world in which this can be done by anyone, any time, anywhere.

Equipping people for political participation (see Box 22) via education, skill development and access to ICT would also fit into the overall preparation of a society for politically active life in a Knowledge Society. Simple illiteracy is an issue. ICT skills are important. But we are talking about changing much broader legacy systems. Political illiteracy is much more acute. People have very limited political resources (time, understanding of complex issues, democratic experiences that sharpen such skills). Most of us do not know how to put forward an argument, how to debate, or how to win or retreat in order to debate another day. We do not know how to unite our individual will with the wills of others and organize in a political force. We do not know how to do it in the analogue world and we do not know how to do it in the digital world either.

Therefore, the real danger is that we would settle for surrogate, seemingly "knowledge-rich" solutions in which public debate would remain in the hands of experts and/or ideologues, the social background of a person would substitute for his/her knowledge and the number of media outlets or hours of programming would substitute for the desired, ubiquitous presence of occasions for political debate and for mass-creation of the knowledge "to maintain developmental equilibrium" throughout society as a whole.

The political context of knowledge

The Knowledge Society can elect to be smart. A smart Knowledge Society would develop all kinds of knowledge: "to do," "to be," "to coexist" and it would also put its resources into creation and utilization of knowledge "to maintain developmental equilibrium," i.e. into a very broad political process that is informed by mass-produced, politically useful knowledge, fully understanding that genuine participation is the bedrock of the Knowledge Society.

In this context it is useful to have one more look at the "virtuous circle" (Graph 4).

Various shadows of this circle can appear. A Knowledge Society that would exist outside of this circle, or as a pale shadow of it, would elect only to undersupply the knowledge "to maintain developmental equilibrium." This would still be a Knowledge Society. But more likely than not, it would remain ineffective from the point of view of its capacity to assure a high level of quality of life for all people everywhere and dangerous from the point of view of its capacity to assure a high level of safety of life.

To develop and to flourish, the Knowledge Society needs more democracy, not less. We have to find ways in which the "currently existing democracy" can revisit and develop its original design and utilize fully its potential.

Knowledge alone would not emancipate people as creative beings.

Knowledge steered by participatory democracy would.

Box 22

E-platform for genuine participation

Rules

Human rights and freedoms and culture of civic engagement

Basic human rights and freedoms, especially freedom of expression, assembly and association (including by electronic means), as well as a culture of civic engagement are fundamental. The very idea that it is possible to alter social life, i.e. that individual and collective political actions could be organized and will be protected must be culturally and legally available.

Access to quality information

Certification of information provided by the government; rules for release of public information; and adopting a holistic approach to collecting and releasing public information constitute rules in this regard. Rules on the quality of information should extend also to the private sector and the public at large. A society functioning in an environment of high quality information is a public value. It should become a private value too.

Open channels for electronic communication

In a situation in which responsibility for gatekeeping of electronic channels of communication is split between the public and the private sector, common rules of gatekeeping should be worked out. Those gates should be wide open.

Separation of public and private value

The difference between interest and concern must be defined and observed. Both are legitimate in any society, but the former should always be seen as a search for a transaction that supports private value creation. The latter constitutes a search for the common good. Their collusion adopts a perspective of narrow interests and private gains.

Box 22 (cont'd)

Responsiveness of the political and administrative structures

The political and administrative structures must be attentive. Otherwise, the full circle of knowledge creation cannot be closed and participation, including e-participation can be characterized only as pointless. The public decision makers and public administrators must internalize the "new" information produced by exposing the "old" information to the context of people's experiences, interpretation and judgement. This produces a tangible impact through participation, the ultimate reward and incentive in this whole process.

Tools

Tools to make citizens knowledgeable and skilled

Participation must be well informed and skilled. Education, including literacy, general knowledge and civic knowledge must be present in this process. This comprises a number of skills. If education and those skills are not present, they must be supplied in an easy-to-use, affordable way. To wit: literacy today also means ICT literacy and skills; participation means networking skills, skills to organize and sustain domains of shared interest and action, debating and negotiating skills, etc. Participation also requires expertise. Society can decide to devote public money to educate its citizens and prepare them for genuine participation. This option has always been open, but arguably, with modern ICT, and especially the Internet, it becomes easier.

Tools to make citizens connected and networked

Participation must be interactive. This is how knowledge is created and politically useful knowledge is no exception to this rule. Democracy works poorly when individuals hold preferences and make judgements in isolation from one another, as they too often do in today's liberal democracies. The most important part of the process is socialization in the knowledge-creation shared space, a phase in which tacit knowledge is shared horizontally, among peers.

Parameters of the Platform for Participation with the Use of E-government Applications

	Rules	Tools
Public sphere	• Culture of civic engagement • Freedoms • Information management • Gatekeeping of electronic communication channels • Separation of public and private value • Attentiveness of public officials/ public administration	• Use of ICT for information management • ICT applications for implementation of Internet gatekeeping policy
Deliberative resources		• E-government applications for making citizens knowledgeable and skilled • E-government applications for making citizens connected and networked

Source: *2003 World Public Sector Report*, United Nations, 2003, New York

Box 23

Cost of regulation vs. cost of inaction: European environmental rules propel change in U.S.

"Globalization has often been condemned as encouraging a race to the bottom, as multinationals seek the cheapest and the least regulated place to do business. But increasingly, American environmental and public health advocates see globalization as a way to start a race to the top. They are taking their issues to the European Union, hoping to use regulations there as a lever for regulations in the United States.

(…) 'The E.U. is going where no man has gone before,' says James Lovegrove, managing director of the European division of the American Electronics Association, the United States industrial lobby. 'The moment the ink hits the paper in Europe it becomes a global piece of legislation.'

The generally stricter European laws reflect a different philosophical approach to regulation, says Dr. Indra Spiecker, a lawyer specialized in comparative law and assistant professor for American law at the University of Osnabruck in Germany. American lawmakers primarily look to cost-benefit analysis, which holds that the benefit of imposing regulation should outweigh the cost. European nations have more readily embraced what is called the precautionary principle. Essentially, Europeans emphasize the cost of inaction, while Americans tend to focus on the cost of action.

(…) European legislation can have an even more immediate impact in the area like consumer electronics. Because of the global nature of the electronics business, a multinational that redesigns its product to eliminate a substance banned in the E.U. often finds it cheaper to sell that product worldwide.

One such law that came into force last year limits or eliminates metals used in electronics considered particularly noxious when they leach into the environment.

The E.U. is now considering sweeping new regulation of its chemical industry that has unleashed what analysts here say is the biggest lobbying effort in Brussels ever mounted by American industry.

The new law, known as Reach, would place the burden of proof of safety on the producers before its sale, rather than waiting for problem to spur regulation later. It would force American chemical companies to comply with the legislation in order to continue exporting to Europe – and raises the fear of similar legislation in the United States.

(…) American environmental groups are eagerly supporting the law. 'This is the place where the action is,' says Tony Long, director of the World Wildlife Fund European policy office. (…) 'This will have results around the world,' he says."

Source: *The New York Times*, 6 July 2004

Question 19: How do we measure if a society is developing as a smart Knowledge Society?[156]

Based on the analysis presented above, the Report attempts to measure if the direction that a society chooses in its development as a Knowledge Society supports high quality and safety of life. It measures this "foresightedness" by looking at the degree of negative impact of the chosen direction of development on people and on the natural environment.

The Report measures the negative impact on people through the GINI Index – an index representing inequalities in income distribution; and by child mortality, which

one may consider as a good indicator for the incidence of human poverty and marginalization.

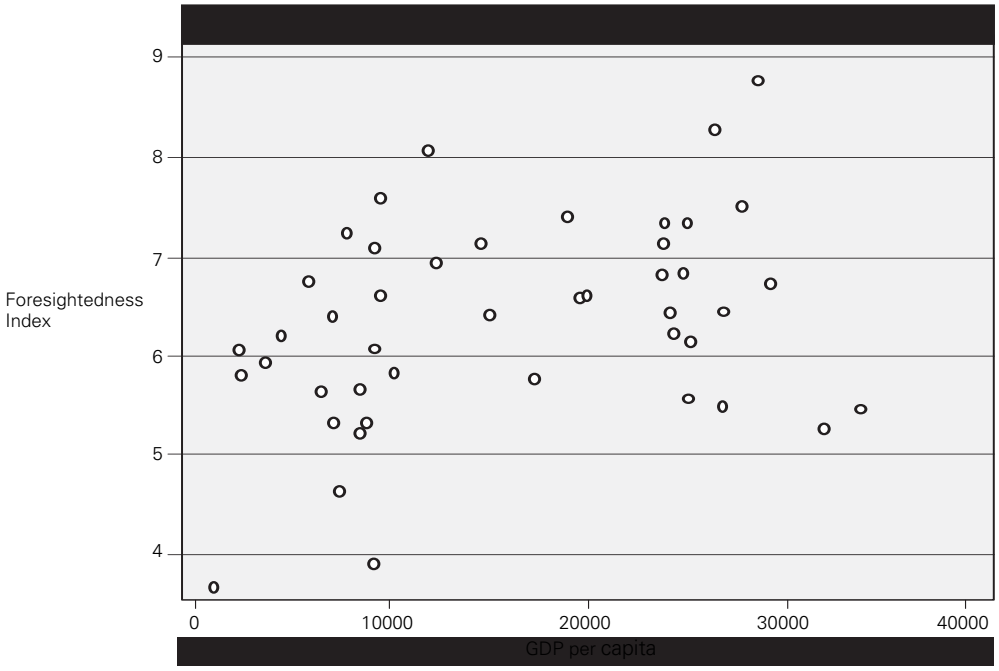
As for negative impact on the natural environment, the Report uses as measures, carbon dioxide emissions and the percentage of protected areas of total land surface, which represent a country's commitment to the protection of its biodiversity and natural environment.

Results based on these indicators are provided in Table 5.

The Foresightedness Index exhibits interesting and somewhat unexpected results. Apparently, one does not have to be rich to be smart in development; and when accumulation of wealth is combined with uneven income distribution, narrow encompassing interest tends to prevail.

The formerly observed positive relationship between the "wealth" of a country and its performance on both the Assets and, in some way, the Advancement Index, seems to blur here. A simple plot of the Foresightedness Index results against GDP per capita well illustrates this phenomenon (see figure below):

Figure IV.1.
Plot of GDP per capita versus Foresightedness Index

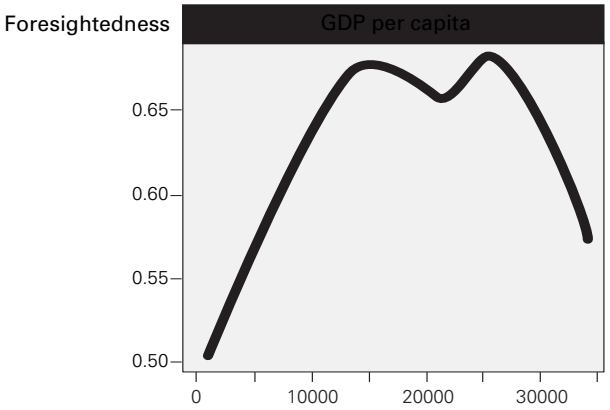


As can be seen, no clear linear relationship exists between the wealth of a country and the "foresightedness" with which it grows and develops.

However, while the relationship is not linear, that does not mean that there is no relationship at all. A deeper analysis could help in identifying more complex patterns between the two variables. A non-parametric regression[157] of the Foresightedness Index results against the GDP per capita suggests that GDP per capita is positively correlated to the "Foresightedness Index" only up to a certain threshold (see figure below). Beyond that threshold the relationship starts faltering and then it declines sharply. In other words,

when wealth is pushed beyond certain value levels, the harmonic relationship with "smart" growth tends to vanish, and the additional wealth created beyond that point tends to be associated with negative outcomes in the quality of human development or in the natural environment, or both.

The relationship between GDP per capita and the Foresightedness Index



Looking more closely at the performance of some specific groups of countries and looking for sub-trends within the Index, other interesting results can be noticed.

Three of the countries that were among the best performers in the previous two Indices – Australia, Canada and the United States – are now much lower. As for Australia and Canada the main driver of this result is the poor scoring on both the environmental indicators. In the case of the United States, the environmental results are aggravated by performance on the income distribution side, which shows a large inequality rate in income distribution among citizens.

Northern European countries are no longer a compact group located at the higher end of the ranking. With the exception of Denmark, which positions itself as the top country in the sample, all the others are now scattered over various parts of the ranking – with only Sweden managing to remain in the top 10. The main problem with these countries seems to be that – even though they all exhibit excellent performances in income distribution and child mortality – they tend not to follow the same "good behaviour" pattern on the environmental side. Norway, in particular, has one of the lower percentages of protected land in the sample.

Except for Estonia, which has actually worsened its position, Eastern European countries captured by this sample have tended to improve their positions in this ranking compared to the previous ones. In general these countries have good income distribution values and low child mortality (except for Ukraine), along with quite low carbon dioxide emissions.

Latin American countries captured by this sample (in South and Central America) tend to have low attainments on the side of income distribution, and, in most cases, this poor result is accompanied by very low rates of land protection, thus positioning the majority of these countries at the low end of the ranking. The most notable exception is Costa Rica which, with its very good environmental results and low child mortality rates, manages to place itself among the five top countries in this sample.

Table 5
The Foresightedness Index

	Country Name	Foresightedness Index	Child Mortality	GINI Index	Protected Areas	CO2
1	Denmark	0.876	0.992	0.993	1.000	0.520
2	Austria	0.828	0.985	0.833	0.906	0.588
3	Slovakia	0.807	0.955	0.962	0.688	0.623
4	Costa Rica	0.759	0.940	0.408	0.750	0.936
5	Switzerland	0.750	0.977	0.760	0.563	0.701
6	New Zealand	0.740	0.977	0.676	0.719	0.588
7	Sweden	0.734	1.000	0.985	0.250	0.701
8	Germany	0.733	0.985	0.620	0.844	0.485
9	Latvia	0.724	0.865	0.781	0.406	0.843
10	Czech Republic	0.713	0.985	0.973	0.500	0.392
11	United Kingdom	0.712	0.970	0.682	0.656	0.539
12	Croatia	0.709	0.962	0.874	0.219	0.779
13	Hungary	0.693	0.955	1.000	0.219	0.598
14	Japan	0.683	0.985	0.989	0.219	0.539
15	France	0.682	0.977	0.771	0.313	0.667
16	Panama	0.674	0.835	0.336	0.625	0.902
17	Norway	0.673	0.992	0.963	0.188	0.549
18	Spain	0.661	0.977	0.777	0.250	0.637
19	Poland	0.660	0.955	0.802	0.281	0.603
20	Israel	0.658	0.977	0.695	0.469	0.490
21	Netherlands	0.645	0.977	0.775	0.375	0.451
22	Finland	0.643	0.985	0.968	0.250	0.368
23	Republic of Korea	0.641	0.985	0.803	0.219	0.559
24	Bulgaria	0.640	0.902	0.794	0.156	0.706
25	Italy	0.622	0.977	0.680	0.219	0.613
26	Ukraine	0.620	0.872	0.875	0.031	0.701
27	Belgium	0.614	0.977	0.985	0.094	0.402
28	Chile	0.607	0.932	0.088	0.594	0.814
29	Republic of Moldova	0.605	0.782	0.676	0.031	0.931
30	Egypt	0.593	0.714	0.725	0.031	0.902
31	Estonia	0.583	0.932	0.636	0.375	0.387
32	Bolivia	0.581	0.444	0.441	0.500	0.941
33	Greece	0.577	0.985	0.698	0.094	0.529
34	Uruguay	0.566	0.902	0.437	0.000	0.926
35	Tunisia	0.564	0.820	0.525	0.000	0.912
36	Australia	0.556	0.977	0.703	0.438	0.108
37	Canada	0.550	0.970	0.805	0.313	0.113
38	United States	0.547	0.962	0.548	0.656	0.020
39	Colombia	0.533	0.850	0.097	0.250	0.936
40	Malaysia	0.533	0.962	0.318	0.156	0.696
41	Ireland	0.527	0.977	0.684	0.031	0.417
42	Mexico	0.523	0.805	0.243	0.250	0.794
43	Brazil	0.464	0.752	0.000	0.188	0.917
44	Trinidad and Tobago	0.390	0.872	0.563	0.125	0.000
45	Madagascar	0.367	0.000	0.406	0.063	1.000

Notes

105 Compare: “We do not get economic development by simply piling up stocks of old things. We do not get it, for instance, by simply accumulating big piles of wheat in warehouses. Rather, it consists in the development of new machines, tools, habits of behavior, and social organizations, all of which derive essentially from changes in knowledge.” Source: Kenneth Boulding, “A Primer on Social Dynamics,” *The Free Press*, NY, 1970.

106 Compare: “The conclusive discovery by a pair of wheeled robots that Mars once had vast pools of water and possibly could have harbored life was chosen by the editors of the journal *Science* as the most important scientific achievement of 2004. The first runner-up for breakthrough of the year was the discovery on the Indonesian island of Flores of fossils from a species of tiny humans who stood about 3 feet tall and had a brain less than a third the size of modern humans. Yet, the diminutive hominid lived about 18,000 years ago. This suggests that Homo floresiensis shared the Earth with Homo sapiens, or modern people. *Science* said some described the find as "the biggest discovery in half a century of anthropological research." Third on S*cience*'s list of 2004 breakthroughs was the cloning of human embryos by South Korean researcher Woo San Hwang and his colleagues. The work was not an attempt to genetically duplicate a human. Instead, the researchers hoped to make embryonic stem cells for research purposes. Although many other mammals have been cloned, the work was the first to demonstrate that cloning techniques would work with human cells.” Source: *USA Today*, December 16, 2004

107 Compare: “(…) there is this idea in society in general (…) that the truth is ‘out there.’ There is this idea with respect to social reality that there is a truth, the truth to be found, and it’s out there, and it’s external, and universal, and stable, and fixed, and independent. And that what we need to do is find it, and all will be saved, explained, etc. I think that idea has been a big blind spot. And people transfer that idea to technology, so now we have the notion that the truth is in the technology. If we can just implement the right technology, all our problems will be solved. This is the technology as the silver bullet. If we could just give up on that notion and recognize that we create the truth, or rather truths, and that they aren’t out there but they’re enacted through what we do, and that they are provisional, dynamic, emerging, and embedded. I think intellectually, conceptually, theoretically, and methodologically that would be very helpful.” Source: “Awareness is the First and Critical Thing,” Interview with Professor Wanda Orlikowski, MIT Sloan School of Management, 7 September, 1999, accessed at: http://www.dialogonleadership.org/interviewOrlikowski.html.

108 Public policy on spending public money on science and technology as well as on publicly funded R&D is in many developed countries (e.g. European Union) based on technology foresights. According to Ahdi Salo and Kerstin Cuhls (see: “Technology Foresight – Past and Future,” *Journal of Forecasting*, 22, 79-82, 2003), the stress in these exercises has been gradually moving to dropping the “technology” qualification of the foresights, in view of the growing concern with public policies and societal challenges (education, health, services, environment, etc.), to broadening the scope of involved stakeholders, converting the “foresighting” into a collective endeavour and turning to quality of life as the overarching criterion for appraising technologies.

109 *World Development Report 1991*, *The Challenge of Development* studies two different aspects of policy – price distortions and education – and then plots the results against growth in aggregate GDP for 60 developing countries. The countries that scored badly on both aspects of policy grew at 3.1% a year. The countries that did well on one aspect of policy and did badly on the other grew, in each case, by 3.8% per year. The countries that scored highly on both measures of policy grew by an impressive 5.5% a year. “When you get different aspects of policy right, it seems, the whole is greater than the sum of the parts,” concludes *The Economist*, 13 July 1991.

110 See footnote 2. Source: Jerzy Szeremeta, “From Welfare State to Liveable State,” March 1999, unpublished. Additionally, regulatory aspects of the “liveable” state warrant better elaboration. Tacit knowledge and creativity are mobile in absolute terms, but are “stickier,” if compared with finance or production facilities. This gives the opportunity to governments to try and trap those with the highest levels of education and skills. But this is not enough by far. Thanks to global networks, explicit knowledge (i.e. information) is spatially fluid. This necessitates continuous upgrading of local capabilities and securing flexibility in the competencies and capabilities of the local community. Thus, building a “liveable state” is never done. Attracting and trapping talented people is crucial. Continuous upgrading of their ability to be creative is equally indispensable. The debate is shifting

therefore from pondering over the question as to if public policies can make a difference. It moves on to the question of what kind of policies and institutions are most conducive for unlocking new sources of economic growth, i.e. human creativity. Trade liberalization also needs local proactive and sophisticated industrial, innovation and investment policies. All this must be played out locally, in the framework of a 'liveable" state. There are no satisfactory alternatives.

111 Compare: "Knowledge workers will not be a majority in the knowledge society, but in many if not most developed countries they will be the largest single population and work-force group. And even where outnumbered by other groups, knowledge workers will give the emerging knowledge society its character, its leadership, its social profile. They may not be the ruling class of the knowledge society, but they are already the leading class. And in their characteristics, social position, values, and expectations, they differ fundamentally from any group in history that has ever occupied the leading position. (…) knowledge workers gain access to jobs and social position through formal education. (…) Increasingly an educated person will be someone who has learned how to learn and who continues learning, especially by formal education, throughout his or her lifetime. (…) [S/he] will have to learn to use different kinds of teams for different purposes. (…) [S/he will] own the tools of production (…) [and] organizations [will] need knowledge workers far more than knowledge workers [will] need them." Source: Peter F. Drucker, November 1994, ibid.

112 In their study (2004, ibid.), Richard Florida and Irene Tinagli note the following: "The central tension is based on values, not on wealth. (…) The key element of global competition is no longer the trade of goods and services or flows of capital, but the competition for people. (…) economic leaders of the future will not likely be among giants like India or China that are becoming global centers for cost effective manufacturing and the delivery of basic business processes. Rather, they will be the nations and regions within nations that can best mobilize the creative capacities of their people and attract creative talent from around the world." Their analysis suggests that "(…) the competitive epicenter of Europe is shifting from the traditional powers like France, Germany or the UK, to a cluster of Scandinavian and northern European countries. (…) competitiveness in the Creative Age is an open game. (…) The winners (…) in the global creative economy will be those nations that are best able to attract, retain and develop creative talent and harness their creative assets and capabilities."

113 The social/cultural factor cannot be overestimated. According to Peter F. Drucker, ibid., "Today (…) we are trying to maintain the traditional mind set, in which the capital is the key resource and the financier is the boss, while bribing knowledge workers to be content to remain employees by giving them bonuses and stock options. But this, if it can work at all, can work only as long as the emerging industries enjoy a stock-market boom, as the Internet companies have been doing. The next major industries are likely to behave far more like traditional industries – that is grow slowly, painfully, laboriously. (…) Bribing the knowledge workers on whom these industries depend will therefore simply not work. The key knowledge workers in these industries will surely continue to expect to share financially in the fruits of their labor. But the financial fruits are likely to take much longer to ripen (…) Increasingly, performance in these new knowledge-based industries will continue to depend on running the institution so as to attract, hold and motivate knowledge workers. When this can no longer be done by satisfying knowledge workers' greed, as we are now trying to do, it will have to be done by satisfying their values, and by giving them social recognition and social power. It will have to be done by turning them from subordinates into fellow executives, and from employees, however well paid, into partners."

114 Compare: "The productivity of the non-knowledge, services worker will become the social challenge of the knowledge society. On it will depend the ability of the knowledge society to give decent incomes, and with them dignity and status, to the non-knowledge workers." Source: Peter J. Drucker, ibid. This of course is wishful thinking. Indeed, on the economic side, the main divide in the Knowledge Society will be exactly along the productivity line. And there can be no realistic expectation that this gap can be closed by growth in the productivity of the non-knowledge workers. That is why the market economy as the framework for the Knowledge Society would most likely fail. It would offer only "income-based" creativity circles, tie dignity and status to the level of income, and in this way permanently exclude the non-knowledge workers. What is needed here is a Smart Knowledge Society that revamps institutions to open possibilities for human development, including lifetime learning for all; rethinks value structures and the notions of dignity and status in society; makes quality information available to all; and opens the "dignity-of-creativity-based" creative circles and "dignity-of-participation-based" creative circles to all. This would be a power shift in the name of

respect for humanity of all people everywhere. It would depend on the values that would shape the will of the knowledge workers, or on a recalculation of their interest in the face of anger and courage mobilized by awareness of depravation.

115 During the Round Table on Harnessing Emerging Technologies to Meet the Development Goals Contained in the Millennium Declaration, held during the meeting of the United Nations Conference on Trade and Development, Sao Paolo, 14 June 2004, "Speakers (…) noted with concern the underinvestment in development-related research and development. More and more research is directed to making profits rather than solving the problems that are the bane of humanity; for example, 90 per cent of the world's diseases receive a mere 10 per cent of total R&D expenditure. Given the global inequality of income, truly sustainable development can only be ensured through democratic participation by all nations in science and technology governance and cannot be left to the highly idealized concept of the 'market.' (…) The international community was called on to explore ways of conducting R&D that are not market-driven." See: UNCTAD, TD/L.383, 17 June 2004

116 Compare: "There may be (…) two good reasons for companies to worry about their ethical reputation. One is anticipation: bad behavior, once it stirs up a public fuss, may provoke litigation that companies will find more irksome than self-restraint. The other, more crucial, is trust. A company that is not trusted by its employees, partners and customers will suffer. In an electronic world, where [some] companies are geographically far from their customers, a reputation for trust may become even more important." Source: "Business ethics. Doing well by doing good," *The Economist*, 22 April 2000

117 Regulatory reform should not be perceived as taking away from the environment that which is conducive to business development. As stated by OECD ("About Regulatory Reform," OECD 2000, accessed at: http://www.oecd.org/subject/regreform/about/index/htm): "Regulatory reform that enhances competition and reduces regulatory cost can boost efficiency, reduce prices, stimulate innovation, and improve the ability of economies to adapt to change and remain competitive in the global markets. Properly done, regulatory reform can also help governments promote other important policy goals such as environmental quality; health and safety. (…) Today, the basis for most reforms in the OECD area is the concept of "regulatory quality," based on competitive markets and proactive role of good government in establishing effective, marker-oriented regulatory and competition regimes and institutions, as well as social policies that efficiently achieve high standards of [environmental, consumer and safety] protection."

118 This thought was reflected by Carl Sagan in his TV series "Cosmos" and a book by the same title (Random House, New York, 1980) in which he observed: "(…) if even a small fraction of technical civilizations learn to live with themselves and with weapons of mass destruction, there should be now an enormous number of advanced civilizations in the Galaxy. (…) Why are they not here? (…) perhaps we are the first. (…) Perhaps we are mistaken in our belief that at least occasional civilizations avoid self-destruction.

119 Compare: "Technology has taught us how to become gods, before we have learned how to be men." Source: Herbert Muller, *The Children of Frankenstein*, University of Indiana Press, 1970

120 In 1979, radioactive gases were released from the Three-Mile Island nuclear power plant in Harrisburg, Pennsylvania, USA. No immediate deaths were reported and long-term effects of the exposure are alleged to be minimal. In 1986 the world's worst nuclear power accident occurred at Chernobyl in the former USSR (now Ukraine). The Chernobyl nuclear power plant, located 80 miles north of Kiev, had four reactors and while testing reactor number four numerous safety procedures were disregarded. The chain reaction in the reactor got out of control, creating explosions and a fireball, which blew off the reactor's heavy steel and concrete lid. The Chernobyl accident killed more than 30 people immediately, and as a result of the high radiation levels in the surrounding 20-mile radius, 135,000 people had to be evacuated. Governments in the region estimate that up to seven million people were affected by the accident. There has been a dramatic increase in the number of thyroid cancers and leukaemia, as well as birth defects, especially in Belarus. The region is also affected by a serious, ongoing, lifestyle-related health crisis, and it is difficult to establish exactly how many people have died as a result of the nuclear accident. The Chernobyl plant remained in service until December 2000. Eventually things will get back to normal in Chernobyl. It will be in 25,000 years.

121 According to the U.S. Department of Energy, Office of Nuclear Energy, Science & Technology [http://www.nuc.umr.edu/nuclear_facts/spacepower/spacepower.html] by the mid-1950s, research had begun in earnest on ways to use nuclear power in space. These efforts resulted in the first

radioisotope thermoelectric generators (RTGs), which are nuclear power generators built specifically for space and special terrestrial uses. These RTGs convert the heat generated from the natural decay of their radioactive fuel into electricity. The low-power devices are designed to supplement a craft's primary non-nuclear power source, but as the technology progressed, they soon began shouldering many missions' entire power needs. This raises concerns [Compare: Karl Grossman, at http://www.flybynews.com/archives/ref/kg9612ba.htm] about nuclear debris in space or possible contamination of Earth, during mishap on the launching pad or in case of a crash of a spacecraft on Earth. Such concerns have been especially well-pronounced in the case of space missions that have used the gravitational strength of Earth in a "sling-shot manoeuvre" to increase the spacecraft's velocity. The most recent one, the Cassini probe sent in the direction of Saturn, carried 72.3 pounds of plutonium fuel – the largest amount ever used on a space-craft. Plutonium is one of the most toxic substances known. It is so deadly that less than one-millionth of a gram is carcinogenic. If the Titan IV carrying the Cassini had exploded on lift-off, it could have scattered plutonium over a wide area of Florida and caused thousands of cancer deaths. Much of the world's population would be exposed to radiation if the spacecraft plunged into Earth's 75-mile-high atmosphere during a "sling-shot manoeuvre." To gain enough velocity to travel to Saturn, the spacecraft orbited Venus twice and came speeding back toward Earth at 42,300 miles per hour. Passing just 312 miles above the Earth, it swung around the planet using centrifugal force to sling it toward Saturn. A slight miscalculation could have resulted in an inadvertent re-entry and subsequent radiation exposure affecting "approximately 5 billion of the (…) world population," according to NASA's "Final Environmental Impact Statement on the Cassini Mission." Mishaps of this nature (though thankfully, by any measure, not even close to the same magnitude) have happened in the past. Grossman reports that taking such risk may have been unnecessary: The European Space Agency (ESA) announced in 1994 what it called a "technological milestone" – the development of high-efficiency solar cells to generate the modest amount of electricity needed for deep space probes like Cassini. As an ESA physicist told the newspaper *Florida Today* in 1995, if given the money to do the work ESA "within five years could have solar cells ready to power a space mission to Saturn."

122 In 1984, poison gas leaked from a pesticide plant run by Union Carbide in the city of Bhopal, India. The methyl isocyanate gas (MIC) had escaped when a valve in the plant's underground storage tank broke under pressure. According to the most conservative estimate, almost 4,000 people were killed. Thousands more have died since and hundreds of thousands were permanently affected.

123 "The large increase of electronic products' consumption rates leads to the question of electronic waste (e-waste) management, which has already become an issue of grave environment and health concern –particularly as computer waste is concerned. The increasing obsolescence rates of IT products added to the huge import of junk computers from abroad create dramatic scenario for solid waste management in India. US alone throws out thirty million computers per year. Many of them end up in India and China. These old computers have a lot of toxic material in them, i.e. mercury, lead, flame-retardants, and PVC-coated copper wire. Dumping them in countries like India, particularly Delhi – India's computer heartland – is harmful both to the environment and to its people. Computer recycling involves employing people to strip down the computers and remove parts that can be used again in machines to be sold on the high street. The rest is afterwards burned or dumped. Burning releases toxic chemicals into local environment. This impacts the health of the employees as well, who get respiratory diseases and skin rashes, not to mention that they earn approximately half-a-dollar a day. Alarmingly, there are no specific laws or regulations dealing with this problem in India." Source: "Scrapping the hi-tech myth – Computer waste in India," February 2003, accessed at http://www.toxicslink.org/publicationsdet.php?id=31 and "Growing Concern over India's E-Waste," *BBC News*, 12 December 2003, accessed at http://news.bbc.co.uk/2/hi/south_asia/3307815.stm.

124 "Genetic coding is very complex even in simple organisms like bacteria. Thus, no one can possibly predict the effects of introducing new genes into plants and how it will affect the long-term health. Public reaction to GMOs has not been favorable, to say the least. At the same time, though, biotechnology companies claim that their manipulations are similar to natural genetic changes or traditional breeding. However, the cross-species transfers being made, such as between fish and tomatoes, or between other unrelated species, would not happen in nature and may create new toxins, diseases, and weaknesses. Biotechnology companies also claim their methods are precise. In fact, there is a random element in gene insertion methods. Genetic research shows that many weaknesses in plants, animals and humans have their origin in tiny imperfections in the genetic code.

Therefore, side effects and accidents are inevitable, and scientists have assessed the risks to be unlimited. They are concerned with dangerous new diseases, resistance to antibiotics, and severe immune reactions. Genetic engineering also interferes with RNA editing and molecular folding, which may cause the formation of prion-based diseases similar to BSE (mad cow disease). Unlike nuclear contamination, gene pollution can never be cleaned up; genetic mistakes are passed to all future generations of a species." Source: http://www.naturallaw.org.nz/genetics/NZStory/G-danger.asp. A good example of such a scenario is the development by two US companies of a genetically engineered strain of creeping bentgrass for use on golf courses that is resistant to the widely used herbicide, Roundup. The altered plants would allow groundskeepers to spray the herbicide on their greens and fairways to kill weeds while leaving the grass unscathed. The Forest Service has concluded that the altered grass "has the potential to adversely impact all 175 national forests and grasslands." Source: *The New York Times*, 21 September 2004.

125 "Many warn the industry, that unless the public concerns are addressed in an appropriate and timely manner, nanotechnology could face the same problems that the GM industry did. Unlike it was predicted, consumers met the suggestion of cheaper food with sceptisims. The same is happening in nanotechnology. (…) Some watchdog groups, such as the Winnipeg, Canada-based ETC Group, are calling for all nanotech research to be put 'on hold' until the complete health risks can be assessed. Prince Charles has asked the Royal Society, the UK's national academy of science to take into account the 'enormous environmental and societal risks' of nanotechnology." (…) "The potential benefits of molecular manufacturing are immense, but so are the dangers. It has the potential to disrupt many aspects of society and politics. The power of the technology may cause two competing nations to enter a disruptive and unstable arms race. Weapons and surveillance devices could be made small, cheap, powerful, and very numerous. Cheap manufacturing and duplication of designs could lead to economic upheaval. Overuse of inexpensive products could cause widespread environmental damage. Attempts to control these and other risks may lead to abusive restrictions, or create demand for a black market that would be very risky and almost impossible to stop; small nanofactories can be very easy to smuggle, and fully dangerous. There are numerous severe risks – including several different kinds of risk – that cannot all be prevented with the same approach. Simple, one-track solutions cannot work. The right answer is unlikely to evolve without careful planning." Sources: "Much Ado About Almost Nothing: Nanotechnology," *The Economist*, US Edition, 20 March 2004; Ivan Lerner, "Nanotechnology Faces Recent Problems in Public Image Markets," *Chemical Market Reporter*, 19 May 2003 and http://www.crnano.org/dangers.htm.

126 "Aristotle opened his *Metaphysics* with the simple statement: 'All men by nature desire to know.' We have, as a bedrock value in our society, long agreed on the value of open access to information, and recognize the problems that arise with attempts to restrict access to and development of knowledge. In recent times, we have come to revere scientific knowledge. (…) If we could agree, as a species, what we wanted, where we were headed, and why, then we would make our future much less dangerous – then we might understand what we can and should relinquish." Source: Bill Joy, "Why the Future Doesn't Need Us?," *Wired Magazine*, April 2000

127 This empirical observation is caught in the "real" business cycle theory (John Long and Charles Plosser, 1983; Barro and Robert King, 1984; Prescott, 1986): "This theory proceeds from the assumption that there are large random fluctuations in the rate of technological change. Because these fluctuations lead to fluctuations in relative prices, individuals rationally alter their labor supply and consumption. The business cycle is (…) the natural and efficient response of the economy to changes in available production technology." Source: N. Gregory Mankiw, "A Quick Refresher Course in Macroeconomics," *Journal of Economic Literature*, Volume 28, Issue 4, December 1990.

128 Compare: "(…) some serious people are already suggesting that we simply move beyond Earth as quickly as possible. We would colonize the galaxy using von Neumann probes, which hop from star system to star system, replicating as they go. (…) What are the moral implications here? If we must move beyond Earth this quickly in order for the species to survive, who accepts the responsibility for the fate of those (most of us, after all) who are left behind? And even if we scatter to the stars, isn't it likely that we may take our problems with us or find, later, that they have followed us? The fate of our species on Earth and our fate in the galaxy seem inextricably linked." Bill Joy, ibid.

129 While the currently existing market also produces on occasion positive externalities (e.g. on-the-job training of labour), it is not designed to do so. Availability of mass-produced knowledge "to do" would not change this design. However, availability of mass-produced other kinds of knowledge could

change the behaviour of people within the institution of the market, and as a consequence, change the institution of the market as we currently know it.

130 Compare: "The Ptolemys did not merely collect established knowledge; they encouraged and financed scientific research and so generated new knowledge. The results were amazing: Erathostenes accurately calculated the size of the Earth, mapped it and argued that India could be reached by sailing westward from Spain. Hipparchus anticipated that stars come into being, slowly move during the course of centuries, and eventually perish; it was he who first catalogued the positions and magnitudes of the stars to detect such changes. Euclid produced a textbook on geometry from which humans learned for twenty-three centuries, the work that was to help awaken scientific interest of Kepler, Newton and Einstein. Galen wrote basic works on healing and anatomy, which dominated medicine until the Renaissance. (…) Alexandria was the greatest city the western world has ever seen. People of all nations came here to live, to trade, to learn. On any given day, its harbors were thronged with merchants, scholars and tourists. This was a city in which the Greeks, Egyptians, Arabs, Syrians, Hebrews, Persians, Nubians, Phoenicians, Italians, Gauls and Iberians exchanged merchandise and ideas. It is probably here that the word cosmopolitan realized its true meaning – citizen not just of a nation, but of the Cosmos. To be a citizen of Cosmos. Here clearly were the seeds of the modern world. What prevented them from taking root and flourishing? Why instead did the West slumber through a thousand years of darkness until Columbus and Copernicus and their contemporaries rediscovered the work done in Alexandria? I cannot give you a simple answer. But I know this: there is no record in the entire history of the Library, that any of its illustrious scientists and scholars has seriously challenged the political, economic and religious assumptions of their society. The permanence of stars was questioned; the justice of slavery was not. Science and learning in general were the preserve of a privileged few. The vast population of the city had not the vaguest notion of the discoveries taking place within the Library. New findings were not explained or popularized. The research benefited them little. Discoveries in mechanics and steam technology were applied mainly to the perfection of weapons, the encouragement of superstition, the amusement of kings. The scientists never grasped the potential of machines to free people. [With the single exception of Archimedes, who during his stay at the Alexandrian Library invented the water screw, which is used in Egypt to this day for the irrigation of cultivated fields. But even he considered such mechanical contrivances far beneath the dignity of science.] The great intellectual achievements of antiquity had few immediate practical applications. Science never captured the imagination of the multitude. There was no counterbalance to stagnation, to pessimism, to the most abject surrenders to mysticism. When, at long last, the mob came to burn the Library down, there was nobody to stop them. The last scientist who worked in the Library was a mathematician, astronomer, physicist and the head of the Neoplatonic school of philosophy – an extraordinary range of accomplishments for any individual in any age. Her name was Hypatia. She was born in Alexandria in 370. (…) The Alexandria of Hypatia's time – by then under Roman rule – was a city under grave strain. Slavery had sapped classical civilization of its vitality. Christian Church was consolidating its power and attempting to eradicate pagan influence and culture. Hypatia stood in the epicenter of these mighty social forces. Cyril, the Archbishop of Alexandria despised her (…). In great personal danger she continued to teach and publish, until, in the year 415, on her way to work she was set upon by a fanatical mob of Cyril's parishioners. They dragged her from her chariot, tore off her clothes, and, armed with abalone shells, flayed her flesh from her bones. Her remains were burned, her words obliterated, her name forgotten." Source: Carl Sagan, 1980, ibid.

131 "Scaling Up Poverty Reduction," A Global Learning Process and Conference, Shanghai, 25-27 May 2004

132 Compare: "Poverty is no longer inevitable in the world today. Both the resources – food, shelter, skills and training – and all the means to make these resources available to all exist. Absolute poverty can be eradicated in less than a generation. Lack of political commitment, not financial resources, is the real obstacle to poverty eradication." Source: "Globalization without Poverty," Council of Europe, Global Solidarity Campaign, April 2002

133 Indeed, this seems more about justice than charity. For instance, John Rawls [*A Theory of Justice*, Harvard University Press, Cambridge, MA, 1971] believes in the need to apply **basic fairness** in order to arrive at social justice. According to him, fairness for a group of people involves arriving at rules and guiding principles of social organization that pay similar attention to everyone's interests, concerns and liberties; and, guarantee equity and efficiency of distribution of opportunities, with priority given to the worst off people.

134 Sageeta Sharma in her presentation to the 26th Congress of the International Institute of Administrative Sciences (IIAS), Seoul, Republic of Korea, 15 July 2004.

135 Compare: "The analysis of man's nature in our modern conceptions is represented roughly by a threefold division – body, mind, and soul or spirit; but our notions about these are extremely hazy. Science has made an elaborate study of the structure and functions of the body, but is much handicapped in its understanding thereof by a lack of knowledge of the principles which come next in order to the body. As to the mind, this word denotes roughly the personal thinking ego and its thoughts, emotions, and volitions. There are various systems of psychology, which deal with this, but here again the want of knowledge concerning the other principles has caused great confusion. The soul or spirit is an even more vague conception. It stands for what in religion is regarded as the immortal part of man. Very little is known of its nature, and it is for the most part supposed to function after the death of the body. Dogmatic religion discouraged the intellectual study of such questions; and science, having been introduced in a spirit of reaction against dogmatic religion, has scrupulously avoided pushing its investigations any further than the material world. Consequently we have been left without any adequate notion of the nature of man; and the most important parts of human nature are investigated neither by religion nor by science." Kathrene Tingley, "The Seven Principles of Men", *Theosophical Manuals*, 1907, accessed at http://www.theosophy-nw.org/theosnw/ktmanual/kt-7prin.htm.

136 Compare: Irshad Manji, "The Trouble with Islam," University of Toronto, and also www.stmartins.com. For her, faith constitutes an invitation to explore. It gives people the permission to think. It is a buffer against materialism. As such it is distinct from dogma and from the prevailing practice of a dogma.

137 Compare: "Scientists have identified five extinction events in Earth's history, with some so severe that more than 90 percent of all life forms were killed off. 'We are in the middle of the sixth extinction event that began about 50,000 years ago' with the expanding role in the world of human beings, said Paul Martin, a zoologist and geochemist at the University of Arizona in Tuscan. Miller [Scott Miller, a biologist with the Smithsonian National Museum of Natural History] and Martin both point to the hundreds of species, mostly large animals and birds, that already are gone, some wiped out directly through human action. Miller said that the most significant thing (…) is that '[there is] good evidence of [for instance] insect population decline that is at a much higher rate than assumed in literature. The butterfly may be a good indicator for what is happening to other insects.' Source: "Report sees major extinction under way," accessed at http://www.msnbc.msn.com/id/4555025/. And, "(…) poor natural resource management is but one factor in the world's diminished environmental state. The drivers of ecosystem degradation are rooted in an economic system that often rewards exploitation rather than stewardship of natural systems. They manifest in an inequitable distribution of property and power over natural resources and ecosystems, so that environmental benefits are not equally shared. They express themselves in rising per capita consumption in developed nations, and relentless population growth as well as a persistent legacy of poverty in the developing world – all factors that increase demand for what ecosystems can yield. But these drivers, too, are failures of governance – of inadequate regulation and outmoded subsidies, of undemocratic processes, of weak leadership and widespread apathy. Better environmental governance will mean dealing with these root causes, as well as with failed models of resource management." Source: *World Resources 2002-2004: Decisions for the Earth: Balance, voice, and power*.

138 Compare: "Viewed through lens of 21st century science, anxiety, alienation and hopelessness are not just feelings. Neither are love, serenity and optimism. All are psychological states that affect health just as clearly as physical fitness. And the brain, as the source of such states offers a potential gateway to countless other tissues and organs – from the heart and blood vessels to the gut and immune system. (…) [For instance] there is now little question that uncontrolled stress can kill. (…) people who believe that they'd been hexed by voodoo witch doctors could drop dead from sudden and massive stress response [of the body]." Source: Herbers Benson, Julie Corliss, Geoffrey Cowley, "Brain Check," *Newsweek*, 4 October 2004

139 Descartes felt that the flow of blood from the heart to the brain served the purpose of producing "animal spirits" which animated the body. Homer and Aristotle believed that the heart was the seat in which intelligence resided. Galileo presented the view that science should only be concerned with primary qualities, those of the external world that could be measured or weighed. The secondary

qualities, such as love, beauty, meaning and value, were said to lie outside the realm of science. Descartes supported this idea and proposed two categories: mind and matter. The matter category related to physical or extended substance, the mind category to thinking substance – that which is un-extended and indivisible. Thus, these philosophers and scientists distinguished the physical operation of the brain from the thought process. However, recently, researchers have begun to challenge the mind/matter split with evidence that human qualities associated with the mind, such as personality, at least in part are determined by biochemistry. Source: http://physics.syr.edu/courses/modules/MM/brain/brain.html.

140 Compare: "Men cope with fear and horror through denial, hard work, superstition, fatalism, prayer and humor. Drinks and drugs also help relieve stress (…). Religion also offers solace and justification. 'Whatever we were doing – murder, atrocities – God was always on our side,' remarks a (…) veteran. (…) Training and language are often used to portray the enemy as hateful, barbaric or sub-human - (…) 'beasts walking on two legs.' This helps justifying killing in the minds of many soldiers." Source: *Acts of War, The Behavior of Men in Battle*, Richard Holmes, Weidenfeld and Nicolson, 2004.

141 Compare: "(…) we are one human family. By simply being born into this world, we are of one inheritance and one stock with every other human being. This oneness expresses itself in all the richness and diversity of the human family: in different races, cultures, languages and histories. And we are called to recognize the basic solidarity of the human family as the fundamental condition of our life together on this earth. (…) To recognize the social solidarity of the human family brings with it the responsibility to build on what makes us one. This means promoting effectively and without exception the equal dignity of all as human beings endowed with certain fundamental and inalienable human rights. This touches all aspects of our individual life, as well as our life in the family, in the community in which we live, and in the world. Once we truly grasp that we are brothers and sisters in a common humanity, then we can shape our attitudes towards life in the light of the solidarity which makes us one." Source: John Paul II, 1 January 1987, http://www.fju.edu.tw/homepage2/peace/1987e.htm. And, "When millions of people are suffering from a poverty which means hunger, malnutrition, sickness, illiteracy and degradation, we must not only remind ourselves that no one has the right to exploit another for his own advantage, but also and above all we must recommit ourselves to that solidarity which enables others to live out, in actual circumstance of their economic and political lives, the creativity which is a distinguishing mark of the human person and the true source of the wealth of nations in today's world." John Paul II, speech to the 50th session of the UN General Assembly, New York, September 2000.

142 "In the official world – the world of work, business, and politics – nature is conceived as the inanimate source of natural resources, exploitable for economic development. (…) The mechanic approach has provided us with technological and industrial progress; it has given us better means of fighting diseases; it has helped transform traditional agriculture into agribusiness and animal husbandry into factory farming; and it has given us weapons of unimaginable power. Modern economics are built upon these mechanistic foundations, and everyone is influenced by them. (…) Our private relationship with nature presupposes that nature is alive and usually, at least implicitly, feminine. The approach of the mechanistic scientist, technocrat, economist, or developer is based on the assumption, at least during the working hours, that nature is inanimate and neuter. Nothing natural has a life, purpose, or value of its own; natural resources are there to be developed, and their only value is the one placed on them by market forces and official planners. (…) Our human dependence on the living processes of the earth was largely forgotten with the growth of industrial civilization. Now we are being forced to remember that (…) the human economy is embedded within the ecology of biosphere." Source: Rupert Sheldrake, *The Rebirth of Nature. The Greening of Science of God*, Park Street Press, Rochester,Vermont, 1991.

143 "Gaia, as I see her, is no doting mother tolerant of misdemeanors, nor is she some fragile and delicate damsel in danger from brutal mankind. She is stern and tough, always keeping the world warm and comfortable for those who obey the rules, but ruthless in her destruction of those who transgress. (…) Gaia theory is as out of tune with the broader humanist world as it is with established science. In Gaia we are just another species, neither the owners nor the stewards of this planet. Our future depends much more on a right relationship with Gaia than with the never-ending drama of human interest." Source: James Lovelock, *The Ages of Gaia. The Biography of Our Living Earth*, Oxford, 1988

144 Compare: Vaclav Havel, "The Need for Transcendence in the Postmodern World," http://www.worldtrans.org/whole/havelspeech.html: "We enjoy all the achievements of modern civilization that have made our physical experience on this earth easier in so many ways. Yet, we do not know exactly what to do with ourselves, where to turn. The world of our experiences seems chaotic, disconnected, confusing. There appear to be no integrating forces, no unifying meaning, no true understanding of phenomena in our experience of the world. Experts can explain anything in the objective world to us, yet we understand our own lives less and less. In short, we live in the postmodern world, where everything is possible and almost nothing is certain. (…) By day we work with statistics; in the evening we consult astrologers and frighten ourselves with thrillers about vampires. The abyss between rational and the spiritual, the external and the internal, the objective and the subjective, the technical and the moral, the universal and the unique, constantly grows deeper." And also, G. de Purucker, "The Secret of Human Conflict," http://www.theosociety.org/pasadena/wind/ws-02.htm#secret. "The great loss of modern civilization is forgetfulness of the fact in nature of universal brotherhood, which does not merely mean a sentimental or political brotherhood; it rather means that we are all of one common cosmic or spiritual origin, and that what affects one affects all. Therefore, the interests of the unit are insignificant as compared with the interests of the multitude. But forget not that the multitude is composed of units, so that one cannot be unjust or cruel or do wrong even to a single unit without offending the whole. (…) Human conflicts would end, and fairly rapidly too, if all of us were to realize our individual responsibility towards our fellowmen. I think that just that one rule would run through all the fabric of human life from the highest to the lowest: our solidarity as units in a human hierarchy, so that what affects one affects all, whether for good or for ill."

145 Compare: "After World War II, the immediate goal of development was to bring about 'growth' (as defined by an increase in GNP) in developing countries. During the 1950s and 1960s, the aim was to turn traditional societies into industrial economies (modernization theory). These goals were based on the theory that mankind must pass through stages in order to become 'developed.' The United States was considered to be the epitome of a 'developed' state. Its example was to set the path for underdeveloped countries. The goal was to help these countries through the stages that the developed countries had undergone in order to reach the ideal of full development. Development policy was essentially driven by economics. Political scientists, public administrators, geographers and others generally accepted the imperative of economic change and a vision of progress governed by economic ideals. This mode of development required that developing countries import vast amounts of goods to turn their economies into producer economies, resulting in huge debt loans. Subsequently, criticisms of this approach focused on how development affected social structures within societies. The research on sociological changes, however, dealt more with the structures of society and not with the traditional cultural mores or values which may have been affected. Even though differing social science methods were used to analyze development, the influences of politics, culture, and social subsystems continued to bias analyses in reductionist fashion. In developed and developing countries alike, basic questions began to be asked which were moral rather than economic, political, or technological. These questions included: What is the good life and good society in a world of mass technology and global interdependence? Is fullness of good compatible with abundance of goods? Is human development something more than a systemic combination of modern bureaucracy, efficient technology, and productive economy? What kind of development is human? How must such development be obtained? (…) Economics has been criticized (…) as too positivistic, and reductionalistic since values and preferences really direct economic activity. (…) Western economic analysis is applied to cultures in which many values that are taken for granted in Occidental countries are either completely absent or are present only in strongly modified forms. It is most interesting that the widespread new awareness in rich countries such as ecology, the value of human relations in the midst of bureaucratic societies, and the need to nourish the spirit with wisdom is traditional and more characteristic of underdeveloped countries. Indeed, many poor societies have long understood what developed countries are just beginning to discover, namely that the meanings attached to life and death are ultimately more important than mere material abundance or technological control over nature. It has been said that we put our pride in technical achievements, probably because they are less arduous than social betterment and spiritual improvement, and because they entail no heart-searching, no laborious choices, as do social ends based on human values." Source: Glenda Roberston, "Development Ethics, Development Express," CIDA, February 1996, accessed at: http://www.acdi-cida.gc.ca/xpress/dex/DEX9602.htm.

146 As stated in the Report of the Secretariat, "The role of the public sector in advancing the knowledge society" (E/C.16/2004/4), presented to the third session of the UN Committee of Experts on Public Administration: "The idea of knowledge development as an important element of governance is certainly not new. However, knowledge [in the political process] has assumed an even greater degree of relevance as well as a different shape with the advent and deepening of the knowledge economy and society. There are multiple drivers of this phenomenon; among them the way in which society is becoming more complex and unpredictable in both positive and challenging ways. (…) in terms of determining the direction of the knowledge society within the human development framework, the participation of the public is indispensable. Knowledge processes should support what people want, as opposed to what is good to a single sub-sector, via definition, examination, challenge to and possible adjustment of purpose. Therefore new channels should be sought for the individual to participate as a social citizen and to play various roles such as that of producer, end-user, mediator and decision maker. This raises issues of democratization of the knowledge society and the need for the creation of a public space where citizens can contribute to 'politically useful knowledge.'"

147 Compare Mahatma Gandhi's seven sins of public life: "Politics without principles; wealth without work; pleasure without conscience; knowledge without character; commerce without morality; science without humanity; worship without sacrifice." Quoted by James S. L.Yong in a presentation to the 2nd APEC High Level Symposium on e-Government, Acapulco, 6-8 October 2004.

148 Ancient Greeks were the first people to live in a democracy (imperfect as it was), to debate it and to write about it. Their democracy assumed equality of all people (except slaves and women) and based itself on the conviction that a citizen was a thinking being and could be convinced by an argument (as opposed to an autocratic order). In this way it also assumed equality between the one who was speaking and the one who was listening. See: Kenneth Minogue, *Politics: A Very Short Introduction*, Oxford Paperbacks, 2000

149 Compare: "The rise of knowledge society is happening both in the economic and professional spheres, and in the public domain. Today, the citizens are not only interested in knowing the facts and theories, but are also attracted by shared contemplation of the impact that new knowledge and new technologies are having in their lives. The usual form of governance in democratic societies is becoming obsolete. The relationship between decision makers, the media, and public opinion is facing instability. Thus, today's new society needs a new form of governance." Michel Demazure, 2001, ibid.

150 **"Public sphere"** designates a theatre in modern societies in which political participation is enacted through the medium of talk. It is the space in which citizens deliberate about their common affairs, hence, an institutionalized arena of discursive interaction. This arena is conceptually distinct from the State; it is a site for the production and circulation of discourses that can in principle be critical of the State. The public sphere is also conceptually distinct from the official economy; it is not an arena for market relations but rather one of discursive relations, a theatre for debating and deliberating rather than for buying and selling. Thus the concept of the public sphere permits us to keep in view the distinctions between state apparatuses, economic markets and democratic associations. The theory of the "public sphere" has been formulated by Jurgen Habermans in his book, *Structural Transformations of the Public Sphere*. In this Report, its definition, as well as its critique, has been based on Nancy Fraser, "Rethinking the Public Sphere: A contribution to the Critique of Actually Existing Democracy."

151 Compare: "Radical democrats hold that individuals will respond positively to political opportunities when they are empowered to decide things that matter and that these responses generate desirable effects on individuals, political culture, and political institutions. To be sure, we still do not know whether democratic opportunities would evoke such responses, because in today's societies the domain of democracy is narrow, empowerment is limited, and opportunities to make a difference in the course of everyday life are rare. The relationship between political engagements and outcomes is too remote to know whether the hopes of radical democrats hold good. (…) radical democrats would do well however to recognize the inherent discomforts of politics (…) They should ask whether, when opportunities present themselves (as they sometimes do), people will jump at the chance to become active participants. If they do not, it may not be just because our culture includes apathy and excessive individualism, but also because of unattractive features of politics as such. Radical democrats must therefore think about how institutional designs could lessen and contain the risks of politics, while still offering the means to articulate and negotiate its discomforts. At the very least,

deliberative spaces must be set aside within and between institutions and formalized in ways so as to make voice easier and more egalitarian. These spaces must be protected by the fabric of rights, welfare supports, and egalitarian patterns of ownership in ways that limit the risks for those who would move onto socially groundless terrain. And while the core of radical democracy should consist of deliberative processes, standard adversarial procedures have a place where an irreducible pluralism of interests (or time constraints) limits the capacity for deliberation to produce decisions. Debates, voting, litigation, and other adversarial mechanisms can defend against social ground-lessness through formalization and sometimes (in the case of secret ballots) through silence – which our post-modern condition assures a continuing place in political life." Source: "What Should We Expect from More Democracy?: Radically Democratic responses to Politics," Mark E. Warren, *Political Theory*, Volume 24, Issue 2 (May, 1996) p 266

152 Nancy Fraser, ibid. develops the theory of "weak," deliberative only publics and of a "strong" public that not only deliberates, but also has real impact on decision making and accountability.

153 Compare: "The pooling of knowledge in communities of practice serves many purposes in politics. Some are relatively obvious: using the Internet and other emerging communication technologies, for example, the participants in activist groups can more easily coordinate their political tactics. But the main significance of the ubiquitous lateral comparing of notes might be more fundamental: it amplifies what might be called the collective cognition of the society. This cognitive background noise, which occurs in any society but is especially developed in the networked democracies, covers a spectrum from mundane chatter through the coordination of practical activities to the sharing of news on current issues to the overt work of political coalition-building. The entire spectrum is necessary: without the hum of everyday information-sharing, it is unlikely that the community's members will be on the same page when a political issue emerges." Source: Philip E. Agre, ibid.

154 Some speak of "electronic" or "digital" commons. They see it as "(…) a new kind of institution in a new era, an electronic version of the old town square or marketplace. It is designed to help create the public space where citizens can assemble, meet, discuss, debate and explore their community, their membership in it and their common interest." Source: Donald Lenihan, Jay Kaufman, ibid.

155 Compare: "(…) one of the most direct routes to better environmental decisions is to provide easy access to environmental information and encourage broad participation – direct or indirect – in environmental decisions. (…) This 'environmental empowerment' of the public can bring accountability to local, regional, and international decisions and can harness the energy and creativity of those with the greatest stake in successful environmental management: the people who live in or depend on the affected ecosystems. (…) Some key questions in environmental governance are: Who makes and enforces the rules for using natural resources? Who represents those who use or depend on natural resources when decisions on these resources are made? How do those who control and manage natural resources answer for their decisions, and to whom? How open to scrutiny is the decision-making process? How do financial practices, economic policies, and market behavior influence authority over natural resources? How is ecological and social science incorporated into decisions on natural resource use to reduce risks to people and ecosystems and identify new opportunities?" Source: *World Resources 2002-2004: Decisions for the Earth: Balance, voice, and power*.

156 The methodology for ranking countries in this chapter and for the overall IKS (Index of Knowledge Societies) is explained in the Annex. However, it should be mentioned here that all this measurement effort has been done on an experimental and illustrative basis. Experimental, as while the Report is based on the belief that measuring assets, advancement and foresightedness of Knowledge Societies would be crucial for the discussion of the subject at hand, no one collects global data that address precisely the phenomena that matter here, e.g. cultural attitudes, level of creativity in school curricula, etc. Thus, proxy indicators have been chosen carefully for the Report. This has been done with full understanding of the difference that separates correlation and causation. The combination of indices in this measuring exercise might change in the future, as more directly relevant data become available. Illustrative, as the existing international statistical databases do not provide comparable information even on these proxies for a larger group of countries than the sample presented. Thus, there is an element of randomness in the choice of the 45 countries presented and that randomness is due to the availability of data for them in all the chosen categories.

157 Specifically, the analysis run is a local polynomial regression.

Conclusion

Question 20: How can a Knowledge Society be understood and what should we do about it?

What is the Knowledge Society?

The Report began by claiming that in some sense we all live in knowledge communities/knowledge societies. It then went on to identify the speed and volume of produced and utilized knowledge (i.e. mass production and mass utilization of knowledge/"new meaning") as a distinctive mark of the "modern," "advanced" Knowledge Societies. We have also talked about Knowledge Societies in their nominal, warped and smart forms. We have indicated that from the point of view of quality and safety of life, just producing one kind of knowledge (e.g. the knowledge "to do") at high speed and in high volume may not be enough. The kinds of knowledge produced and the level of social participation in this process also matter.

Is there then a point, however measured, at which one can determine that a society has successfully completed a transition to the Knowledge Society? That is doubtful. It would mean defining the Knowledge Society in a static way, as one that once and for all has exceeded a precisely determined level of achievement. In a continuous process of life this is hardly possible. The achievements of today do not usually measure up to the challenges of tomorrow and they leave us with a false sense of security.

We would rather suggest that the Knowledge Society is one in which institutions and organizations enable people and information to develop without limits and open opportunities for all kinds of knowledge to be mass-produced and mass-utilized throughout the whole society. At its best, the Knowledge Society involves all members of the community in knowledge creation and utilization; it supports the goal of high quality and safety of life.

The Knowledge Society is therefore more of a collective mindset or distinctive way of life that a society may adopt. It is achieved by giving high value to quality and safety of life, accepting that this goal may be well served by mass production and mass utilization of all kinds of knowledge; rearranging social institutions and organizations accordingly; treating people and information as assets; and involving all people in mass production and mass utilization of knowledge in support of the goal of high quality and safety of life.

Finally, it may be useful to think of the process of successful transition to the Knowledge Society in terms of "fuzzy" logic, describing things that are and are not at the same time. If everything is a matter of degree, as claimed by the "fuzzy" thinkers, then especially in the open-ended domains of creativity, tacit knowledge and information, we usefully can be thinking and talking of ever-increasing degrees, fully understanding that at any time we may be facing ever-decreasing degrees. It is all then about opening or closing the gates, i.e. rearranging social institutions that regulate development of people and information; opening or closing the gates that regulate availability of opportunities for mass production and mass utilization of knowledge; providing opportunities for involving all people in the process of knowledge creation and utilization – all this in pursuit of the goal of high quality and safety of life. Following this logic, the Nominal and the Warped Knowledge Societies are in reality Knowledge Societies that are not. And the Smart Knowledge Society is a Knowledge Society that is, but exists at the brink of not being.[158] We have to learn how to nurture, watch and measure that which we want to be. The direction that we choose and keep will be more important than the degree to which it is realized at any given time. If the former is preserved, eventually the latter will build up.

What is the Knowledge Economy?

The Knowledge Economy can be treated as a subset of the Knowledge Society that narrowly, though quite legitimately, focuses on the use of ICT and mass-produced knowledge to increase value along the whole economic value chain. At the same time, if building the Knowledge Economy were to follow the road of creating a Warped Knowledge Society, this would not be congruous with securing high quality of life in its fullness for all people everywhere or with the goal of high levels of safety of life for all people everywhere. On the other hand, living in a "liveable" state that is home to a Smart Knowledge Society, which features a vibrant Knowledge Economy that supports that society's developmental goals (e.g. high levels of quality and safety of life) is in the interest of all.

The Knowledge Economy can be designed, built and practiced. The Knowledge Society has to be lived.

Would the current institutional set up of market democracies (and/or the institutional changes that are being introduced to it right now) support development of the Smart Knowledge Society?

The answer is: yes, if.

Yes, as Knowledge Societies would benefit from organizing the use of power in a democratic way, but only if they realize that they cannot rely on the currently existing democracies. The democracy that the Knowledge Society needs has to be based on well-informed consent of all citizens that demarcates the parameters of the developmental equilibrium. This would require mass production and mass utilization of the knowledge "to be," "to co-exist" and "to maintain the developmental equilibrium." It would also require a democratic majority featuring the super-encompassing interest that uses public power in accord with the interest of all. Such democracy would constitute the irreplaceable bedrock of the Knowledge Society.

Yes, as Knowledge Societies would benefit from the knowledge "to do" fed into economies being run by the market, but only if they were to realize that they cannot rely on the market mechanisms as practiced right now. The market that the Knowledge Society needs has to be put on new rails that would avoid stations at which part of the real cost of the production of goods and services can be dumped as the loss to society as a whole, i.e. net negative externalities. Such a market would serve as the irreplaceable vehicle for meeting many needs of the Knowledge Society.

To come from "if" to "yes" would require large-scale rebuilding of social institutions (see Graph 5).

If we undertake it, chances are that in the future, when the next generations look back at our time, they will not call this period of human development the Age of Knowledge,[159] but rather they will call it by its true name: the Age of Responsibility.

What if we do not? The nature of the next era is beyond anyone's power to define. However, even a simple extrapolation of current trends that avoids the most negative extremes paints a picture of lost opportunities for growth and development (see Box 24). We can and should do much better.

What factors can support the change?

The source of support for a major institutional shift can be found in citizens' awareness of the benefits of the Knowledge Society and their wish to make them part of their life experience. This requires high levels of such awareness and an understanding of the depravation that comes from denying these opportunities; organization of individual will into influential social forces; and broader access to and a stronger voice for these social forces in the public sphere. This could come with initial institutional transformation that would help to develop citizens and democratic institutions.

Another source of support for such a shift may come from the logic of the institution of the market itself. If it is true that people and information are the main assets of the Knowledge Society and that they can develop limitlessly, anything less efficient than this would undercut the ability of the market to live up to its full potential. This might put the market on a collision course with the groups of narrow encompassing interest that would not enable limitless development of people and information and would, instead, cling to the old power-sharing arrangements. Historically, the market has always prevailed.

Finally, a new understanding among people about themselves and their position in the universe may be needed. If we could agree on a unifying central cultural thought for humanity and if this thought would support human development and protection of the biosphere, a serious global dialogue could obtain and against this dialogue public and private (including business) activities could be judged in the court of public opinion. Encouraging or discouraging signals could be generated in society as a result of these judgments.

The transition will not happen "by itself." Over its course, we will have to make choices, take decisions and often struggle. Being responsible in thoughts often requires boldness in actions.

What are the choices for the use of power?

It is impossible to overestimate the positive role in this process that must be played by the public at large and the Report has been clear about it on more than one occasion. However, in today's prevailing political reality one can unscramble the "we" as mainly political leaders, business leaders and governments. They must decide if they believe in (or even want to be bothered by) "something new" that has allegedly happened and allegedly been pushing them towards change. And in case they do, they would have to figure out what the pattern of change is.

They are more likely than not to be aware that "the new" is modern ICT, including the Internet, and that the interpretation of this fact currently dominant among the countries of the developmental North names the availability of well-managed information as the main feature of the pattern of change. This realization leads development strategies and plans in two directions.

First, it leads them towards resolution at the local level of the tension between technology and organizations (e.g. by development of e-government, with the hope that it will add value along the public value chain; and e-business, to add value along the economic value chain).

And second, it leads them towards building up local capacity to dominate as large as possible a share of the emerging market in ICT-based or ICT/information-related goods and services.

[Under this scenario, the broader tension between technology (modern ICT) and society is depicted also as mainly an information management matter.]

If political leaders, business leaders and governments start taking steps in this general direction it will mean that they have determined that the currently prevailing trend will become the winning trend and that they have decided to become part of that new reality – to generate wealth, to create jobs, to grow and develop. For some, this may not immediately mean much in political or economic terms. Many public budgets tend to feature deficits. Local business is weak. International investors may not be interested in many communities as markets. However, adopting these convictions would point leaders and their policies in a specific direction. Now already, and in the future as the situation allowed, they would lead their societies in that direction. Much of the effort to restructure internally and to attract investors and donors would be devoted to linking their societies

to this new reality that they believe it is beneficial to embrace. For them, not making this link would mean deciding to stay on the periphery of the emerging global reality. As noted in the Report, this would mean initially building the Knowledge Economy within a Warped Knowledge Society and hoping for a possible later-day evolution into a Smart Knowledge Society.

This Report raises the stakes much higher.

It claims that the skill to mass-produce knowledge, as opposed to the mere appearance of modern ICT, is the real agent of change and that the emergence of developed people and developed information as the main assets of any society and economy constitutes the real pattern of change.

In the long run, this shift in understanding the pattern of change demands adjustments in the main social institutions (i.e. democracy and markets, as we know them) and redirection in society of the flow of resources and development opportunities. In this process, converting organizations and eventually society as a whole into "shared spaces for knowledge creation" would constitute resolution of the tension between technology and organizations. The development of citizens and deepening of democracy would constitute resolution of the broader tension between technology and society.

Such a policy will not be undertaken if the belief in this pattern of change is not firm, if certainty that change based on it will constitute the winning reality in the future is not absolute, and if fear of remaining out of the loop of these developments is not real. If these conditions are not present, inaction may seem like the best strategy to adopt (at least till the next elections).

Who could do what to make transition to the Smart Knowledge Society happen?

The governments would have to re-invent themselves. This time, the re-invention would have to be not only about the form (e.g. e-government, n-government, k-government, m-government, etc.) but first and foremost about the content in terms of producing public value; and in terms of regulating markets for competitiveness that is achieved without production of loss to society as a whole. Smart Knowledge Societies need homes. "Liveable" states, regions and communities are their natural abodes, and while knowledge is needed to build them, building them is a very specific task, political in nature, that must be executed at a high level of will, dedication and competence. "Failed" states, regions or communities are also the products of very specific, political-in-nature processes. It is crucial for governments to realize that mass production and mass utilization of knowledge do not go hand-in-hand with "failed" developmental situations and that, even in the interconnected world transition from "failed" in its various shadows to "liveable" in its various colours is a local political choice and a local responsibility.

In the specific area of knowledge production and utilization, governments have a unique position, from which they can lead. They can do this by formulating public policies and public budgets that reflect a new set of priorities, and they can lead by example. Existing laws might be used to take even small steps to better develop people and information; to create more knowledge and release it to the public; to create more demand for knowledge of all kinds, produced outside the government, etc. If a new consensus is reached in a society about developmental goals, and if this consensus is about building a Knowledge Society that is focused on high quality and safety of life, then governments will have to act accordingly: legislate, support the new legislation with the rule of law, shift the focus of their activities, restructure public administration for achieving new goals, etc. Today it is unfathomable to think about the existence of Ministries of Human Development, Human Safety or Human Creativity, but the first nation states did not fea-

ture Ministries of Trade, Industry or Agriculture either. Today we do a very poor job of collecting data needed to take the pulse of the Knowledge Society as it develops. New statistics would have to be developed, possibly with the help of international organizations, and systematically collected and analysed.

The political and business elite would have every incentive to at least take a careful look at their interests and recalculate them. To the extent that they control public power, they can actively facilitate or oppose any transition. To the extent that they have an impact on the intellectual debate, they can enrich it by their own understanding of the pattern of change and their own take on it, or they can discourage discussion of impending change. To the extent that they control the news media, they can regulate the scope of reality that is covered by editorial boards. Enlightened behaviour on their side would not have many historical precedents. Acting against such limited expectations would be their challenge.

The citizens would have to demand – and in a well-informed and effective way. Without clear, strong signals from the citizens, opportunities for change that might develop within elite and government circles would face much more effective opposition. To demand the right things would require rethinking interests and messages on the side of civil society too. It would involve learning about and accepting the option of change. Much of the transition would ride on culture and it is the public at large that embraces a culture and on its basis produces the connective fabric that unites (or does not unite) a society. Validation of diversity, validation of creativity, acceptance and high social status bestowed on people that devote themselves to creative thinking, even if this means politicizing issues, all happen in the context of the civil society. This transition will not mean replacing one set of narrow interests with another, up-till-now neglected set of narrow interests. This may come as a novelty to many civil society groupings and organizations or their leaders. Understanding change and rising above the existing patterns of behaviour would be the challenge for many of them.

As so much will depend on learning, understanding, debating, convincing and working out shared positions, the role of the news media cannot be overestimated here. Their ability to meet the challenge would depend to a great extent on the capacity of their editorial boards to seize the depth of the pattern of change and then, within the current political or commercial constraints, attempt to live up to their true vocation. The multiplication of news outlets on the Internet does not relieve other news media outlets of this obligation. It is the mainstream media, which have the resources and access to the public that would have to make the choice: to inform or to entertain, to enlist comment among the leaders of society or to deliver readers/consumers to the advertising agencies. These would not have to be either/or choices and the recalculation of interest among the elites would help. Someone would have to inform the elites (and the public at large) though – about trends that relate to their freedom; about trends in human development the world over; about progress in natural science and technology development – and here the responsibility of the news media should not be abdicated.

The academic world would have to live up to the challenge of firming up its intellectual independence and finding the courage of former times of enlightenment. This might require an institutional change that would alter ways in which academic research is funded or rewarded now. But the news media, civil society, governments and elites would need a massive supply of academically solid, creative thinking that, to a large extent, can only come from the academic community. Historically during periods of transition, some in the academic world have always been able to leave the traditional thinking valleys. We learn their names from school textbooks now.

Finally, the United Nations system now has the opportunity to become a force in the world that understands early on the pattern of the forthcoming change and is ready to engage its Member States in discussion and collaboration to bring the benefits of the mass production and mass utilization of knowledge to all people everywhere. It would be useful for the UN system to reword its language and enrich it with arguments derived from the concept of the Knowledge Society. As the theme of human safety is appearing on the international agenda, with the mass production of knowledge a global dialogue on a safe shared future in the age of knowledge may be considered by the United Nations. And the technical cooperation of the UN system should attune itself to the requests of those Member States who would choose to rebuild their institutions for the specific purpose of accelerating transition to the Knowledge Society. This would require rethinking of content, tools and qualifications within the UN technical assistance community.

* *
*

It is only fitting to end with the conversation from a fable told by the North American Indians, in which a grandfather tells his grandson:

"I have two wolves fighting in my heart. One is good and one is bad."

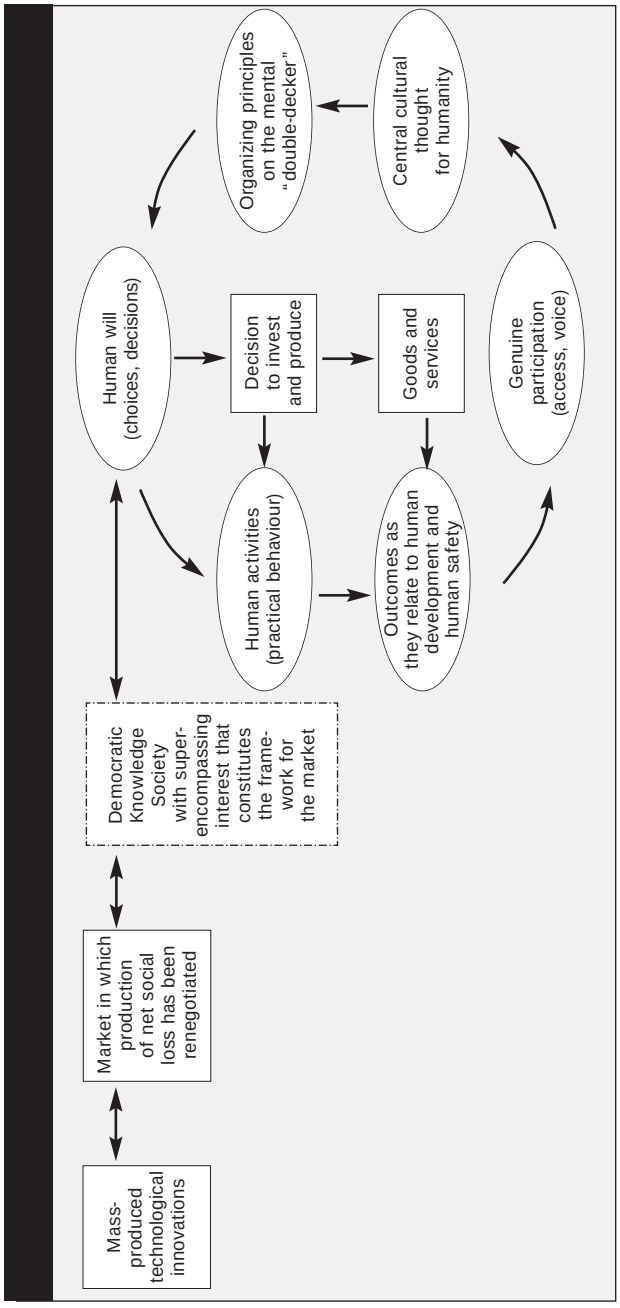
"Which one is going to win, Grandpa?" asks the grandson.

"The one I will feed" answers the grandfather.

* *
*

May we choose wisely…

Graph 5
Ecology of the emerging Knowledge Economy meets the "virtuous circle"



Box 24

Speculation of a scholar: "Are we on the threshold of new Dark Ages that will precede new Renaissance?" [Our century, as described in a history book written circa 2300]

"The population was divided roughly in two groups; they did not like the word 'classes.' The first, less numerous, was made up of men and women who possessed the virtually inborn ability to handle the products of technology and master the methods of physical science, especially mathematics – it was to them what Latin had been to medieval clergy. (…) symbols and formulas to save time and thought – these were for this group of people the source of emotional satisfaction, the means to rule over others, the substance of shoptalk, the very joy and justification of life.

The mind was shaped and the fancy filled by these intricacies, as it had been in an earlier era by theology, poetry and the fine arts. The New Man saw the world as a storehouse of items retrievable through a keyboard, and whoever added to this sum was in high repute. He, and more and more often She, might be an inventor or theorist, for the interest in hypotheses about the creation of the cosmos and the origin of life persisted, intensified, from the previous era. The sense of being close to a final formulation lasted for over 200 years.

It is from this class – no, group – that the governors and the heads of institutions were recruited. The parallel with the Middle Ages is plain – clerics in one case, cybernists in the other. The latter took pride in the fact that in ancient Greek, kubernetes means helmsman, governor. It validated their position as rulers over the masses, which by then could neither read nor count. These less capable citizens were by no means barbarians, yet any schooling would have been lost on them; that had been proved in the late 20th century. Some now argue that the schooling was at fault, not the pupils; but when the teachers themselves declared children un-teachable, the Deschooling Society movement rapidly converted everybody to its view.

What saved the masses from the brutishness was the survival (though in odd shape) of a good deal of literature and history from the 500 years of the western culture, mingled with a sizeable infusion of the eastern. Some among the untutored group taught themselves to read, compiled digests, and by adapting great stories and diluting great ideas provided the common people with culture over and above the television fare. It was already well mixed and stirred by the 21st century. Public readings, recitals of new poems based on ancient ones, simple plays, and public debates about the eternal questions (which bored the upper class), furnished the minds and souls of the ordinary citizen.

As for social organization, the people were automatically divided into interest groups by their residence and occupation, or again by some personal privilege granted for a social purpose.

The nation no longer existed, superseded by regions, much smaller, but sensibly determined by economic instead of linguistic and historical unity.

Their business affairs were in the hands of corporation executives whose view of their role resembled that of their medieval ancestors. Not the accumulation of territories but of companies and control over markets were their one aim in life, sanctified by efficiency. The pretext was rarely borne out, but the game prospered and the character of the players followed another medieval prototype: constant nervousness punctuated by violent and arbitrary acts against persons and firms. (…) There being no visible bloodshed, wounds and distress were veiled.

The comprehensive welfare system, improved since its inception, repaired the damage. Its decisions being all made by computer on the basis of each citizen's set of identity numbers, there could be few tenable grievances. (…) There was thus no place for the citizen-voter and the perpetual clash of opinions that had paralyzed representative governments.

Faith in science excluded dissent on important matters; the method brings everyone to a single state of mind. On the workday plane, the dictates of numerical studies guided the consumer and the parent, the old and the sick.

Box 24 (cont'd)

(…) the chief killer ailment was (…) heart disease, most often linked to obesity. (…)

The moral anarchy complained of in the early days (…) rather suddenly gave way to strict policing of everybody by everybody. (…) vices, having to be concealed, attracted only the bold or the reckless.

(…) As for peace and war, the former was the distinguishing mark of the West from the rest of the world. The numerous regions of the Occident and America formed a loose confederation obeying rules from Brussels and Washington in concert. They were prosperous, law abiding, overwhelming in offensive weaponry (…).

After a time, estimated at a little over a century, the western mind was set upon by blight: it was Boredom. The attack was so severe that the over-entertained people, led by a handful of men and women from the upper orders, demanded Reform (…) the radicals had begun to study the old neglected literary and photographic texts and maintained that they were a record of a fuller life. They urged to look with a fresh eye at the monuments still standing about; they reopened the collections of the works of art that had long seemed so uniformly dull that nobody went near them. (…) in short, they found a past and used it to create a new present. (…) their twisted view of their sources laid the foundation of our nascent – or perhaps one should say, renascent – culture. It has resurrected enthusiasm in the young and talented, who keep exclaiming what a joy it is to be alive."

Source: Jacques Barzun, *From Dawn to Decadence. 500 Years of Western Cultural Life*, Harper Collins, New York, 2000

IKS: The Index of Knowledge Societies[160]

The Index of Knowledge Societies (IKS) is a summary measure of the performance that countries register in the three main dimensions described in the previous parts of the Report: assets, advancement and the "foresightedness" a country displays in its quest to become a Knowledge Society.

IKS' final results are reported in Table 6 and suggest some interesting general observations that are worth mentioning.

The countries that top the IKS ranking are all relatively small countries and economies if compared to traditional "big" countries conventionally regarded as the "world economic leaders." For instance, in the sample of countries under analysis, the United States ranks 12th, France comes 15th, while the United Kingdom is in 10th position. Japan and Germany are the only "big" countries and economies that seem to be holding in these comparisons.

These results suggest that while in an industrial economy an abundance of natural resources and the availability of a large domestic market have been very critical drivers of competitiveness – and that a large economy therefore has held an intrinsic advantage over smaller ones – such a paradigm might not necessarily hold true in the Knowledge Society.

While a country's size is not related to its position in the IKS, it seems that wealth – as measured by GDP per capita – has some positive correlation with the capability to develop a Knowledge Society. There definitely is a general positive relationship between a country's GDP per capita and its position in the ranking. However this relationship is not as strict as one may think. Beyond a certain level of GDP more wealth does not necessarily relate to a better position in the IKS. Sweden, the leader of the ranking, has a

GDP per capita that is far lower than that of the United States. Even more interesting is the case of New Zealand, a country with a GDP per capita that is almost half that of the United States. It still seems to follow a relatively "smarter" path toward the Knowledge Society.

Even though the results suggest that small countries can catch up with the bigger and richer ones, this fact does not mean that they can make the leap easily and linearly.

The case of Ireland is particularly enlightening in this regard. In the past few years Ireland has managed to move from an agricultural economy to one of the richest and most "technology" oriented economies of the developmental North. However, even though Ireland has definitely been able to develop assets needed for a Knowledge Society (as proved by its excellent ranking in the Assets Index), it hasn't managed to accompany such growth with a parallel attention to its natural environment, showing one of the highest CO2 emission rates and one of the lowest proportions of protected land in the entire sample of countries.

Another example could be represented by the Republic of Korea, which, despite being one of the best positioned countries in terms of assets, does not show the same level of performance in advancing its human and information resources, leaving ample room for improvement.

The underlying truth is that the Knowledge Society is not only about rushing in with a diffusion of the Internet or the development of new technologies. Rather, it is about developing a society that maximizes the ability of all its members to participate in the process of knowledge production and diffusion. The Knowledge Society is not only about technological innovations, but also about human beings – their personal growth and their individual creativity, experience and participation. That is the reason why IKS comprises many different dimensions of growth and development in which, right now, very few countries (none) manage to perform very well.

The path towards the Knowledge Society is complex, multifaceted, and riddled with difficulties and IKS represents the first attempt of the United Nations to capture and measure this complexity through a set of objective and comparable indicators. At the same time, it is important to point out the experimental nature of this exercise and the numerous problems that have been encountered in the process of putting the index together. It has been extremely challenging to identify measures able of capturing the critical dimensions of something that is still in the making. It seems that the Knowledge Society is not only calling for transformation in our social and economic institutions but also in our efforts in the area of statistics, and in our approach to measuring that which matters in development as countries transit to the Knowledge Society. Most of the dimensions that are critical for the Knowledge Society are not internationally measured today by any existing inter-governmental organization; or when they are, this is done in a very incomplete way that makes broad international comparisons difficult – short of impossible. IKS has tried to balance the use of meaningful indicators with the problems of data availability and comparability. These problems are reflected in the fact that the final ranking includes only 45 instead of the 191 countries with which we started.

Right now, for reasons mentioned above, IKS is obviously a less than perfect instrument. One can only hope that this imperfection will not be taken as an excuse to go back to more comfortable – and less informative – ways of thinking about ourselves and our choices in development, and that it will motivate us to take on the challenge of measuring societies in a meaningful way as they travel along the path of transition to the Knowledge Society. After all, if we never challenge the existing beliefs, if we acknowledge the limits of the status quo but never dare to exceed them, who will bring about the change that we are all hoping for and how will they do it?

Table 6
IKS

	Country Name	IKS Index
1	Sweden	0.776
2	Denmark	0.763
3	Norway	0.719
4	Switzerland	0.706
5	Finland	0.704
6	Japan	0.696
7	Germany	0.696
8	Austria	0.692
9	New Zealand	0.692
10	United Kingdom	0.688
11	Netherlands	0.675
12	USA	0.632
13	Australia	0.627
14	Canada	0.622
15	France	0.616
16	Israel	0.612
17	Belgium	0.611
18	Republic of Korea	0.599
19	Spain	0.572
20	Czech Republic	0.571
21	Italy	0.563
22	Ireland	0.558
23	Costa Rica	0.556
24	Hungary	0.543
25	Slovakia	0.533
26	Estonia	0.529
27	Poland	0.512
28	Croatia	0.511
29	Latvia	0.511
30	Chile	0.502
31	Uruguay	0.500
32	Panama	0.499
33	Greece	0.482
34	Malaysia	0.471
35	Bulgaria	0.461
36	Tunisia	0.458
37	Mexico	0.457
38	Bolivia	0.431
39	Republic of Moldova	0.415
40	Ukraine	0.393
41	Brazil	0.390
42	Colombia	0.389
43	Egypt	0.384
44	Trinidad and Tobago	0.368
45	Madagascar	0.259

Annex

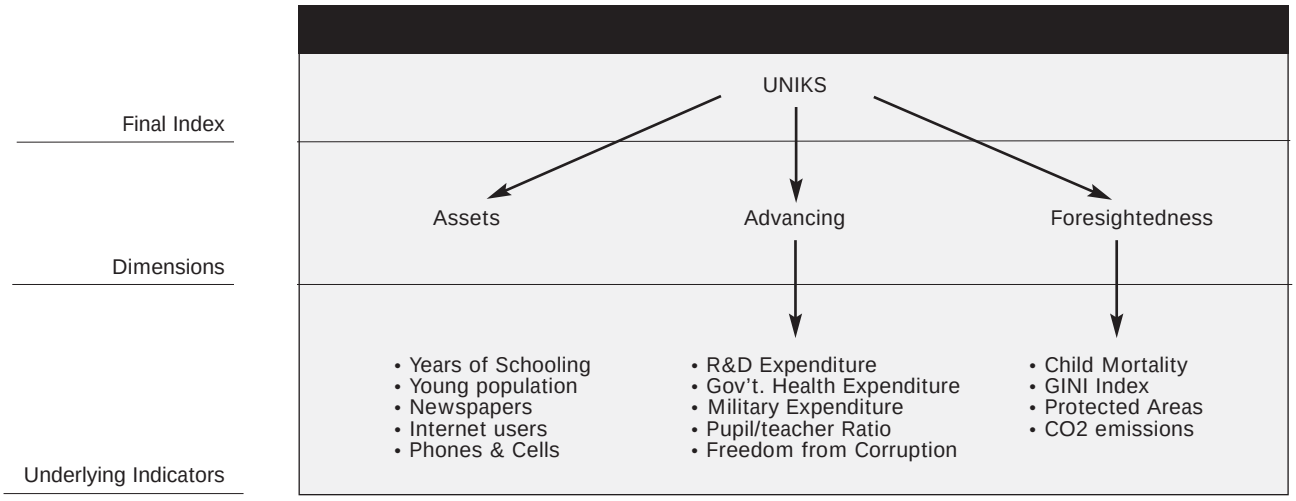
IKS Methodology

The IKS is a synthetic measure that aims at capturing a Member State's achievement as far as the conditions fundamental for the development of a Knowledge Society are concerned. Such conditions are grouped into three main dimensions: Assets, Advancement and Foresightedness, each of which is measured by a number of underlying indicators.

"Assets" are represented by: a large pool of young and educated people (as measured by expected schooling and proportion of people below age 15); and the development of the means through which information can flow (as measured by the diffusion of newspapers, the Internet, main phone lines and cellular phones).

"Advancement" is the degree to which a Member State nurtures and advances its human and informational resources, as measured by: public health expenditure, research and development expenditure, (low) military expenditure, pupil/teacher ratios in primary education, and a proxy of the "freedom from corruption" indicator.

"Foresightedness" is the degree to which a Member State grows and develops along its path to a Knowledge Society, while minimizing the impact of negative externalities on people and the natural environment, as measured by: low child mortality rates, equality in income distribution (GINI Index), protected areas as percentage of a country's surface, and CO2 emissions per capita.



The underlying indicators are expressed in different units and may have different interpretations (positive/negative impact on a Knowledge Society). Therefore the first step for the calculation of IKS has been to express each underlying indicator in a homogeneous and comparable way.

Performance in each indicator is expressed as a value between 0 and 1 by applying the following general formula:

$$IndexValue = \frac{ActualValue - MinimumValue}{MaximumValue - MinimumValue}$$

According to this formula, the country with the lower performance will get an Index value of zero; the country with the best performance will be assigned a value of one; while all other countries will have values reflecting their relative distance from the best and worse performer.

As mentioned above, some indicators have different interpretations with respect to the IKS. In some cases a high value represents a positive outcome, as for example, expected years of schooling, or research and development expenses, while in other cases a high value is, according to the logic of IKS, detrimental, as emissions of CO2 or military expenditure. In these latter cases we have reversed the Index value to make the interpretation of the value the same as that of all other indicators. The formula used to express these indicators as a value between 0 and 1 is, therefore, the following:

$$IndexValue = 1 - \frac{ActualValue - MinimumValue}{MaximumValue - MinimumValue}$$

With this approach all indicators bear the same meaning: the higher the value, the better; and the same interpretation is given to IKS: the higher the value achieved by a country the better its performance as a Knowledge Society.

Once the single indicators have been standardized according to the formulas described above, we have calculated an Index corresponding to each dimension (Assets Index, Advancement Index and Foresightedness Index) by averaging the values of the underlying indicators. IKS is calculated by averaging the values of all the three dimensions' indices.

Finally, as mentioned in the footnotes to the presentations of each of the Indices in the text of the Report, all this measurement has been done on an experimental and illustrative basis. Experimental, as while the Report is based on the belief that measuring Assets, Advancement and Foresightedness of Knowledge Societies would be crucial for the discussion of the subject at hand, no one collects global data that address precisely the phenomena that matter here, e.g. cultural attitudes, level of creativity in school curricula, etc. Thus, proxy indicators have been chosen carefully for the Report. This has been done with full understanding of the difference that separates correlation and causation. The combination of indices in this measuring exercise might change in the future, as more directly relevant data become available. Illustrative, as the existing international statistical databases do not provide comparable information even on these proxies for a larger group of Member States than the sample presented. Thus, there is an element of randomness in the choice of the 45 countries presented and that randomness is due to the availability of data for them in all of the chosen categories.

Table of Indicators, Definitions and Sources

Indicator	Definition	Source
Expected Schooling	The expected number of years of schooling, or school life expectancy (SLE), is defined as the total number of years of schooling that a child can expect to receive, assuming that the probability of his or her being enrolled in school at any particular future age is equal to the current enrolment ratio at that age.	UNESCO Institute for Statistics, http://www.uis.unesco.org
Young Population	Percentage of the total population that is in the 0-14 age group	World Bank, Human Development Network, and the United Nations Statistics and Population Division
Newspapers	Daily newspapers per 1,000 population (Daily newspapers refer to those published at least four times a week.)	UNESCO Institute for Statistics, http://www.uis.unesco.org
Internet Diffusion	Internet users per 10,000 population	ITU http://www.itu.int/ITU-D/ict/statistics
Telephone Diffusion	Main phone lines per 100 population and cellular subscriptions per 100 population	ITU http://www.itu.int/ITU-D/ict/statistics
R&D Expenditure	R&D expenditure as % of GDP	UNESCO Institute for Statistics, http://www.uis.unesco.org
Education Expenditure	Education expenditure as % of total government expenditure (Public expenditure on education is current and capital public expenditure on education.)	UNESCO Institute for Statistics, http://www.uis.unesco.org
Freedom from Corruption	Corruption Perception Index	Transparency International
Child Mortality	Children (under five years of age) - mortality rate per 1,000 live births	UNICEF estimates
Income Distribution (GINI Index)	GINI Index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution.	World Bank's Development Research Group, in *World Development Indicators, 2003*
Protected Areas	Ratio of protected areas to surface area	UNSD calculated from UNEP (Millennium Indicator)
CO2 Emissions	Carbon dioxide emissions (CO2), metric tons of CO2 per capita	UNFCCC-UNDESA/Statistics Division (Millennium Indicator)
Health Expenditure	General government expenditure on health as % of total government expenditure	World Health Organization
Military Expenditure	Military expenditure as % of GDP	CIA World Factbook, http://www.cia.gov
Primary Pupil/ Teacher Ratio	Number of pupils enrolled in primary school divided by number of primary school teachers (regardless of their teaching assignment)	UNESCO Institute for Statistics, http://www.uis.unesco.org

Table 1
Assets Index
Tables with all indicators' original values for all UN Member States

Country Name	Years of Schooling	Young Pop.	Newspapers per 1,000 pop.	Internet Users per 10,000 pop.	Main Phone Lines per 100 pop.	Cell Phones per 100 pop.
Afghanistan	-	43.73	5	0	0.1	0.1
Albania	10.9	28.64	35	39	7.14	27.63
Algeria	11.5	35.39	38	160	6.1	1.28
Andorra	-	-	-	9	43.8	30.2
Angola	-	47.36	11	29	0.61	0.93
Antigua & Barbuda	-	20.99	91	1,282	48.78	48.98
Argentina	14.3	27.46	123	1,120	21.88	17.76
Armenia	8.5	23.03	23	158	14.28	1.89
Australia	16.8	20.45	293	4,817	53.86	63.98
Austria	14.8	16.44	296	4,094	48.88	78.62
Azerbaijan	10.5	28.34	-	369	11.35	10.69
Bahamas	-	28.72	99	1,923	40.56	39.03
Bahrain	13	29.31	112	2,475	26.31	58.33
Bangladesh	8.4	36.99	9	15	0.51	0.81
Barbados	13.1	20.81	200	1,115	49.44	19.8
Belarus	12.2	18.01	177	816	29.94	4.67
Belgium	16	17.19	160	3,283	49.44	78.56
Belize	-	39.33	-	1,089	12.37	20.45
Benin	7	45.84	2	74	0.92	3.22
Bhutan	-	42.99	-	145	2.84	
Bolivia	13.4	39.00	55	324	6.76	10.46
Bosnia & Herzegovina	-	18.33	152	262	23.67	19.63
Botswana	12.4	41.72	27	297	8.72	24.13
Brazil	13.4	28.32	40	822	22.32	20.06
Brunei Darussalam	12.5	31.80	69	1,023	25.57	40.06
Bulgaria	12.7	15.36	257	808	36.77	33.3
Burkina Faso	2.8	47.08	1	21	0.54	0.75
Burundi	4.9	46.00	3	12	0.32	0.74
Cambodia	7	42.75	2	22	0.26	2.76
Cameroon	-	41.74	7	38	0.7	4.27
Canada	15	18.79	159	5,128	63.55	37.72
Cape Verde	-	43.37	-	364	15.99	9.78
Central African Rep.	-	42.35	2	13	0.23	0.32
Chad	5.2	49.61	0	19	0.15	0.43
Chile	13	27.76	98	2,375	23.04	42.83
China	-	24.81	-	460	16.69	16.09
Colombia	11.1	32.30	46	462	17.94	10.62
Comoros	-	43.22	-	42	1.35	
Congo	-	46.23	8	15	0.67	6.72
Costa Rica	10.2	31.16	91	1,931	25.05	11.1
Côte d'Ivoire	-	41.90	16	55	2.04	6.23
Croatia	11.9	16.68	114	1,804	41.72	53.5
Cuba	12.3	21.13	118	107	5.11	0.16

Table 1 (continued)
Assets Index
Tables with all indicators' original values for all UN Member States

Country Name	Years of Schooling	Young Pop.	Newspapers per 1,000 pop.	Internet Users per 10,000 pop.	Main Phone Lines per 100 pop.	Cell Phones per 100 pop.
Cyprus	13	22.79	114	2,937	68.8	58.44
Czech Rep.	13.6	16.20	254	2,563	36.23	84.88
Dem. People's Rep. of Korea	-	27.13	208	-	-	
Dem. Rep. of the Congo	4.3	45.57	3	10	0.02	1.06
Denmark	15	18.39	309	5,128	68.86	83.32
Djibouti	3.9	43.13	-	69	1.54	2.29
Dominica	-	27.25	-	1,603	30.39	12
Dominican Rep.	-	32.93	53	364	11.04	20.66
Ecuador	-	33.41	70	416	11.02	12.06
Egypt	10.1	34.69	40	282	11.04	6.68
El Salvador	10.6	35.27	48	465	10.34	13.76
Equatorial Guinea	-	43.48	5	36	1.74	6.34
Eritrea	5	45.11	-	23	0.9	
Estonia	14.4	17.07	176	3,277	35.06	65.02
Ethiopia	5.2	45.95	1	7	0.53	0.07
Fiji	-	33.22	52	610	11.9	10.97
Finland	16.7	17.91	455	5,089	52.35	86.74
France	15.4	18.73	219	3,138	56.89	64.7
Gabon	-	40.15	30	192	2.47	21.5
Gambia	-	40.09	2	188	2.8	7.29
Georgia	6.4	19.03	-	149	13.14	10.21
Germany	15.3	15.28	311	4,119	65.09	72.75
Ghana	7.3	43.06	14	78	1.27	2.07
Greece	14.9	14.91	153	1,547	49.13	84.54
Grenada	9.7	35.05	-	1,415	31.65	7.13
Guatemala	-	43.24	33	333	7.05	13.15
Guinea	-	44.28	-	46	0.34	1.18
Guinea Bissau	-	43.61	5	40	0.89	
Guyana	9.9	30.43	56	1,422	9.15	9.93
Haiti	-	40.01	3	96	1.57	1.69
Honduras	8.7	41.43	55	252	4.81	4.87
Hungary	13.6	16.45	186	1,576	36.12	67.6
Iceland	16	23.19	537	6,479	65.28	90.6
India	-	33.06	-	159	3.98	1.22
Indonesia	10	30.19	24	377	3.65	5.52
Iran (Islamic Rep. of)	11.3	32.65	28	485	18.66	3.35
Iraq	9.1	40.89	19	0	2.8	0.1
Ireland	14.9	21.47	150	2,709	50.24	76.32
Israel	14.8	27.61	290	3,014	46.72	95.45
Italy	14.9	14.09	104	3,524	48.07	93.87
Jamaica	11	30.69	62	2,285	16.97	53.48
Japan	14.3	14.45	578	4,489	55.83	63.65
Jordan	12.3	38.06	58	577	12.66	22.89

Table 1 (continued)
Assets Index
Tables with all indicators' original values for all UN Member States

Country Name	Years of Schooling	Young Pop.	Newspapers per 1,000 pop.	Internet Users per 10,000 pop.	Main Phone Lines per 100 pop.	Cell Phones per 100 pop.
Kazakhstan	11.7	26.34	-	157	13.04	6.43
Kenya	7.8	42.88	10	125	1.03	4.15
Kiribati	-	38.13	-	2	5.1	0.6
Kuwait	8.7	32.05	374	1,058	20.38	51.9
Kyrgyzstan	-	33.46	15	298	7.75	1.04
Lao People's Dem. Rep.	8.3	42.42	4	27	1.12	1
Latvia	13.3	16.46	247	1,331	30.11	39.38
Lebanon	12.8	31.44	107	1,171	19.88	22.7
Lesotho	10.2	39.57	8	97	1.32	4.25
Liberia	6	44.34	12	0	0.2	0.1
Libyan Arab Jamahiriya	-	33.61	15	225	-	1.26
Liechtenstein	-	-	-	59	58.3	33.3
Lithuania	14.2	18.98	93	1,444	27.03	47.53
Luxembourg	13.1	18.95	325	3,700	79.68	106.05
Madagascar	6.1	44.69	5	35	0.37	1.02
Malawi	-	44.41	3	26	0.7	0.82
Malaysia	12.1	33.55	158	3,197	19.04	37.68
Maldives	11.7	40.95	20	534	10.2	14.91
Mali	2.1	46.97	1	24	0.53	0.5
Malta	14	19.85	126	3,030	52.34	69.91
Marshall Islands	-	-	-	235	7.74	0.98
Mauritania	6.7	43.69	0	37	1.18	9.22
Mauritius	12	25.45	75	991	27.03	28.91
Mexico	11.5	33.59	98	985	14.67	25.45
Micronesia (Federated States of)	-	37.43	-	5	8.7	1.5
Monaco	-	-	-	49	104	59.6
Mongolia	9.8	33.28	30	206	5.27	8.89
Morocco	8.2	34.05	26	236	3.8	20.91
Mozambique	5.8	42.70	3	27	0.46	1.4
Myanmar	7.4	32.70	10	5	0.7	0.1
Namibia	11.9	41.47	19	267	6.48	8
Nauru	-	-	-	3	16	13
Nepal	-	40.65	12	34	1.41	0.09
Netherlands	16	18.44	306	5,063	61.77	74.47
New Zealand	16.4	22.33	216	4,844	44.81	62.17
Nicaragua	-	41.97	30	168	3.2	3.78
Niger	2.6	48.89	0	13	0.19	0.14
Nigeria	-	43.79	24	35	0.58	1.34
Norway	16.9	19.97	588	5,026	73.44	84.36
Oman	9	43.01	29	709	8.39	17.15
Pakistan	-	41.15	23	103	2.5	0.85
Palau	-	-	-	-	-	

Table 1 (continued)
Assets Index
Tables with all indicators' original values for all UN Member States

Country Name	Years of Schooling	Young Pop.	Newspapers per 1,000 pop.	Internet Users per 10,000 pop.	Main Phone Lines per 100 pop.	Cell Phones per 100 pop.
Panama	12.4	30.85	62	414	12.2	18.95
Papua New Guinea	6.1	39.84	14	137	1.17	0.27
Paraguay	10.4	39.14	43	173	4.73	28.83
Peru	-	32.89	0	935	6.6	8.62
Philippines	11	36.83	82	440	4.17	19.13
Poland	14.7	18.74	113	2,300	29.51	36.26
Portugal	-	17.11	75	1,935	42.13	82.52
Qatar	13.1	25.70	175	1,134	28.94	43.8
Rep. of Korea	15.5	21.34	393	5,519	48.86	67.95
Rep. of Moldova	9.7	21.76	60	341	16.07	7.69
Romania	11.7	17.68	-	1,015	19.44	23.57
Russian Federation	-	17.51	105	409	24.22	12.01
Rwanda	-	47.34	0	31	0.28	1.36
St. Kitts & Nevis	-	26.64	-	2,128	50	10.64
St. Lucia	-	31.78	-	824	31.95	8.95
St. Vincent & the Grenadines	-	26.57	0	598	23.35	8.53
Samoa	12	35.75	-	222	5.69	1.5
San Marino	-	-	-	53	76.3	62.1
Sao Tome & Principe	-	39.15	-	728	4.13	1.31
Saudi Arabia	-	40.88	59	646	14.39	21.72
Senegal	-	44.32	5	104	2.23	5.49
Serbia & Montenegro	-	20.09	107	597	23.26	25.66
Seychelles	-	28.14	39	1,452	26.91	55.35
Sierra Leone	-	44.50	4	16	0.48	1.34
Singapore	-	21.32	298	5,044	46.29	79.56
Slovakia	13.1	19.34	184	1,604	26.82	54.36
Slovenia	15	15.61	199	3,758	50.61	83.53
Solomon Islands	-	44.72	-	50	1.49	0.22
Somalia	-	47.79	1	1	1	0.3
South Africa	12.6	32.10	32	682	10.66	30.39
Spain	15.5	14.86	100	1,563	50.62	82.42
Sri Lanka	-	25.90	29	106	4.66	4.92
Sudan	-	40.06	26	26	2.06	0.59
Suriname	-	29.35	122	416	16.35	22.52
Swaziland	12.1	41.91	26	194	3.4	6.1
Sweden	15.9	17.89	445	5,731	73.57	88.89
Switzerland	15.1	16.71	337	3,510	74.42	78.93
Syrian Arab Rep.	9	39.95	20	129	12.32	2.35
Tajikistan	9.9	38.75	20	5	3.73	0.21
Thailand	-	23.61	64	776	10.5	26.04
The former Yugoslav Rep. of Macedonia	-	22.20	21	485	27.13	17.7
Timor-Leste	-	-	-	-	-	...

Table 1 (continued)
Assets Index
Tables with all indicators' original values for all UN Member States

Country Name	Years of Schooling	Young Pop.	Newspapers per 1,000 pop.	Internet Users per 10,000 pop.	Main Phone Lines per 100 pop.	Cell Phones per 100 pop.
Togo	10.5	43.57	4	410	1.05	3.49
Tonga	12.8	33.76	-	292	11.29	3.38
Trinidad & Tobago	11.4	24.95	123	1,060	24.98	27.81
Tunisia	13.7	28.93	31	517	11.74	5.15
Turkey	9.5	28.27	111	728	28.12	34.75
Turkmenistan	-	36.00	-	17	7.71	0.17
Tuvalu	-	-	-	13	6.5	
Uganda	-	49.03	2	40	0.22	1.59
Ukraine	11.4	17.05	54	180	21.61	8.38
United Arab Emirates	10.7	26.06	156	3,132	31.35	69.61
United Kingdom	16.3	18.57	329	4,231	59.06	84.07
United Rep. of Tanzania	5	45.13	4	23	0.47	1.95
United States	15.3	21.15	213	5,514	64.58	48.81
Uruguay	13.7	24.67	293	1,190	27.96	19.26
Uzbekistan	-	36.43	3	109	6.65	0.74
Vanuatu	-	41.34	-	346	3.27	2.42
Venezuela	10.5	33.47	206	506	11.27	25.64
Viet Nam	10.4	32.38	4	185	4.84	2.34
Yemen	8.5	46.18	15	51	2.78	2.11
Zambia	6.9	44.96	12	48	0.82	1.3
Zimbabwe	9.4	44.25	18	430	2.47	3.03

Table 2
Advancement Index

Country Name	R&D Expenditure (% of GDP)	Military Expenditure (% of GDP)	Gov't Health Expenditure (% of tot. gov't exp.)	Pupils per teacher	Corruption Perception
Afghanistan	-	0.01	11.8	43	-
Albania	-	0.0149	7.3	22	2.5
Algeria	-	0.035	9.9	28	2.6
Andorra	-	-	26.3	-	-
Angola	-	0.019	5.5	35	1.8
Antigua & Barbuda	-	-	13	-	-
Argentina	0.45	0.013	21.3	22	2.5
Armenia	-	0.065	11.5	..	3
Australia	1.53	0.028	16.8	..	8.8
Austria	1.94	0.008	10.7	13	8
Azerbaijan	-	0.026	7.2	19	1.8
Bahamas	-	-	15.1	-	-
Bahrain	-	0.075	10.8	-	6.1
Bangladesh	-	0.012	8.7	57	1.3
Barbados	-	-	11.5	-	-
Belarus	-	0.014	14.2	17	4.2
Belgium	1.96	0.013	13	12	7.6
Belize	-	0.02	5	-	4.5
Benin	-	0.027	10.9	54	-
Bhutan	-	0.019	7.5	-	-
Bolivia	0.29	0.016	10.3	24	2.3
Bosnia & Herzegovina	-	0.045	9.6	..	3.3
Botswana	-	0.036	7.6	27	5.7
Brazil	0.77	0.021	8.8	26	3.9
Brunei Darussalam	-	0.059	5.1	-	-
Bulgaria	0.57	0.026	9.3	18	3.9
Burkina Faso	-	0.016	8.1	47	-
Burundi	-	0.06	8.1	50	-
Cambodia	-	0.03	16	53	-
Cameroon	-	0.014	7.8	63	1.8
Canada	1.85	0.011	16.2	15	8.7
Cape Verde	-	0.015	8.8	-	-
Central African Rep.	-	0.011	18.5	74	-
Chad	-	0.021	15.2	71	-
Chile	0.54	0.04	12.7	25	7.4
China	1.00	0.0425	10.2	22	3.4
Colombia	0.25	0.034	10.8	26	3.7
Comoros	-	0.03	5.8	-	-
Congo	-	0.028	5.7	51	2.2
Costa Rica	0.20	0.004	19.5	25	4.3
Côte d'Ivoire	-	0.012	6	48	2.1
Croatia	0.98	0.0239	12.8	18	3.7
Cuba	0.49	0.018	11.4	11	4.6
Cyprus	0.25	0.038	10.2	-	6.1
Czech Rep.	1.30	0.021	14.1	18	3.9
Democratic People's Republic of Korea	-	0.229	3	..	-
Democratic Republic of the Congo	-	0.014	10.3	26	-
Denmark	2.09	0.016	12.8	10	9.5
Djibouti	-	0.044	13.7	-	-
Dominica	-	-	10.5	-	-
Dominican Rep.	-	0.011	13.5	40	3.3

Table 2 (continued)
Advancement Index

Country Name	R&D Expenditure (% of GDP)	Military Expenditure (% of GDP)	Gov't Health Expenditure (% of tot. gov't exp.)	Pupils per teacher	Corruption Perception
Ecuador	0.09	0.024	9.6	23	2.2
Egypt	0.19	0.036	7.4	22	3.3
El Salvador	-	0.011	24	26	3.7
Equatorial Guinea	-	0.025	10	-	-
Eritrea	-	0.118	4.5	45	-
Estonia	0.76	0.02	12.1	14	5.5
Ethiopia	-	0.052	4.9	55	2.5
Fiji	-	0.022	6.9	-	-
Finland	3.40	0.02	10.7	16	9.7
France	2.20	0.026	13.7	19	6.9
Gabon	-	0.02	7.3	49	-
Gambia	-	0.003	13.6	37	2.5
Georgia	0.33	0.0059	6.7	16	1.8
Germany	2.50	0.015	16.6	15	7.7
Ghana	-	0.006	8.6	33	3.3
Greece	0.67	0.043	11.2	13	4.3
Grenada	-	-	12.4	-	-
Guatemala	-	0.008	15.7	33	2.4
Guinea	-	0.017	11.3	44	-
Guinea Bissau	-	0.028	7.4	44	-
Guyana	-	0.008	9.3	-	-
Haiti	-	0.009	14.1	..	1.5
Honduras	-	0.015	13.8	34	2.3
Hungary	0.95	0.0175	11.5	11	4.8
Iceland	3.04	-	17.5	-	9.6
India	1.23	0.024	3.1	40	2.8
Indonesia	-	0.013	3	22	1.9
Iran (Islamic Rep. of)	-	0.033	12	25	3
Iraq	-	-	4.6	21	2.2
Ireland	1.17	0.009	14	20	7.5
Israel	3.62	0.087	11.5	12	7
Italy	1.04	0.019	13	11	5.3
Jamaica	-	0.004	4.4	36	3.8
Japan	3.09	0.01	16.4	20	7
Jordan	-	0.202	12.8	..	4.6
Kazakhstan	0.29	0.009	8	19	2.4
Kenya	-	0.018	6.2	30	1.9
Kiribati	-	-	9.3	-	-
Kuwait	0.20	0.058	8.1	14	5.3
Kyrgyzstan	0.19	0.014	9	24	2.1
Lao People's Dem. Rep.	-	0.005	8.7	30	-
Latvia	0.40	0.012	9.1	15	3.8
Lebanon	-	0.048	9.5	17	3
Lesotho	-	0.026	12	48	-
Liberia	-	0.013	10.6	36	-
Libyan Arab Jamahiriya	-	0.039	5	8	2.1
Liechtenstein	-	-	-	-	-
Lithuania	-	0.019	14	16	4.7
Luxembourg	-	0.009	13.3	-	8.7
Madagascar	0.18	0.012	7.7	50	2.6
Malawi	-	0.007	12.3	56	2.8

Table 2 (continued)
Advancement Index

Country Name	R&D Expenditure (% of GDP)	Military Expenditure (% of GDP)	Gov't Health Expenditure (% of tot. gov't exp.)	Pupils per teacher	Corruption Perception
Malaysia	0.40	0.0203	6.5	18	5.2
Maldives	-	0.086	10.3	-	-
Mali	-	0.013	6.8	63	3
Malta	-	0.007	12.8	-	-
Marshall Islands	-	-	9.6	-	-
Mauritania	-	0.037	10.3	42	-
Mauritius	0.28	0.002	7.6	26	4.4
Mexico	0.43	0.009	16.7	27	3.6
Micronesia (Federated States of)	-	-	8.5	-	-
Monaco	-	-	17.7	-	-
Mongolia	-	0.022	10.5	32	-
Morocco	-	0.048	5.3	28	3.3
Mozambique	-	0.022	18.9	64	2.7
Myanmar	-	0.021	5.7	32	1.6
Namibia	-	0.025	12.2	32	4.7
Nauru	-	-	9.1	-	-
Nepal	-	0.016	8.1	37	-
Netherlands	2.02	0.016	12.2	10	8.9
New Zealand	1.11	0.01	14.8	16	9.5
Nicaragua	0.15	0.012	17.9	36	2.6
Niger	-	0.011	7.7	42	-
Nigeria	-	0.009	1.9	-	1.4
Norway	1.62	0.019	15.2	-	8.8
Oman	-	0.114	6.5	24	6.3
Pakistan	-	0.039	3.5	44	2.5
Palau	-	-	11.6	-	-
Panama	0.35	0.012	18.4	25	3.4
Papua New Guinea	-	0.014	13	36	2.1
Paraguay	-	0.009	16.9	20	1.6
Peru	0.08	0.013	12.1	25	3.7
Philippines	-	0.015	6.2	35	2.5
Poland	0.67	0.0171	10.9	11	3.6
Portugal	0.78	0.023	13.7	13	6.6
Qatar	-	0.1	6.5	-	5.6
Rep. of Korea	2.96	0.027	9.5	32	4.3
Rep. of Moldova	1.13	0.004	10.6	20	2.4
Romania	0.37	0.0247	15.9	20	2.8
Russian Federation	1.00	-	10.7	17	2.7
Rwanda	-	0.029	14.2	51	-
St. Kitts and Nevis	-	-	10.9	-	-
St. Lucia	-	-	8	-	-
St. Vincent & the Grenadines	-	-	9.3	-	-
Samoa	-	-	15.7	-	-
San Marino	-	-	13.8	-	-
Sao Tome & Principe	-	0.008	3.5	-	-
Saudi Arabia	-	0.1	10	12	4.5
Senegal	0.01	0.015	12.9	51	3.2
Serbia & Montenegro	-	-	15	20	-
Seychelles	-	0.018	7	-	-
Sierra Leone	-	0.015	9.4	44	2.2
Singapore	1.88	0.049	5.9	..	9.4

Table 2 (continued)
Advancement Index

Country Name	R&D Expenditure (% of GDP)	Military Expenditure (% of GDP)	Gov't Health Expenditure (% of tot. gov't exp.)	Pupils per teacher	Corruption Perception
Slovakia	0.65	0.0189	8.9	19	3.7
Slovenia	-	0.017	14.6	14	5.9
Solomon Islands	-	-	11.5	-	-
Somalia	-	0.009	4.2	..	-
South Africa	-	0.017	10.9	33	4.4
Spain	0.96	0.012	13.6	14	6.9
Sri Lanka	0.18	0.032	6.1	..	3.4
Sudan	-	0.025	4.6	27	2.3
Suriname	-	0.007	17	-	-
Swaziland	-	0.018	7.5	33	-
Sweden	4.27	0.021	13	11	9.3
Switzerland	2.64	0.01	13.2	14	8.8
Syrian Arab Rep.	0.18	0.059	5.3	24	3.4
Tajikistan	-	0.039	5.5	22	1.8
Thailand	0.10	0.018	11.6	21	3.3
The Former Yugoslav Rep. of Macedonia	0.52	0.06	17.4	22	2.3
Timor-Leste	-	-	9	-	-
Togo	-	0.019	9.3	34	-
Tonga	-	-	10.9	-	-
Trinidad & Tobago	0.14	0.006	6.4	20	4.6
Tunisia	0.45	0.015	15.1	23	4.9
Turkey	0.63	0.053	9.1	..	3.1
Turkmenistan	-	0.034	18.2	..	-
Tuvalu	-	-	2.9	-	-
Uganda	0.75	0.021	16.4	59	2.2
Ukraine	0.95	0.014	7.6	20	2.3
United Arab Emirates	-	0.031	32.3	16	5.2
United Kingdom	1.90	0.024	15.4	18	8.7
United Rep. of Tanzania	-	0.002	12.1	40	2.5
United States	2.82	0.039	17.6	15	7.5
Uruguay	0.26	0.02	14.9	21	5.5
Uzbekistan	-	0.02	9.2	..	2.4
Vanuatu	-	-	9.7	-	-
Venezuela	0.34	0.013	14.7	..	2.4
Viet Nam	-	0.025	6.1	28	2.4
Yemen	-	0.079	4	30	2.6
Zambia	-	0.009	13.5	45	2.5
Zimbabwe	-	0.017	8	37	2.3

Table 3
Foresightedness Index

Country Name	Child Mortality	GINI Index	Protected Areas as % of Surface	CO2 Emissions
Afghanistan	257	-	0	0
Albania	25	-	0.04	0.9
Algeria	49	35.30	0.02	3
Andorra	7	-	-	-
Angola	260	-	0.07	0.5
Antigua & Barbuda	14	-	0.15	4.9
Argentina	19	-	0.03	3.7
Armenia	35	37.92	0.07	1.1
Australia	6	35.19	0.14	18.3
Austria	5	30.50	0.29	8.5
Azerbaijan	96	36.50	0.06	3.6
Bahamas	16	-	0.1	5.9
Bahrain	16	-	0.01	28.8
Bangladesh	77	31.79	0.01	0.2
Barbados	14	-	0	4.4
Belarus	20	30.35	0.04	5.9
Belgium	6	25.00	0.03	12.3
Belize	40	-	0.4	3.3
Benin	158	-	0.11	0.3
Bhutan	95	-	0.21	0.2
Bolivia	77	44.70	0.16	1.3
Bosnia & Herzegovina	18	-	0.01	4.8
Botswana	110	63.01	0.18	2.2
Brazil	36	60.66	0.06	1.8
Brunei Darussalam	6	-	0.21	18.9
Bulgaria	16	31.91	0.05	6.1
Burkina Faso	197	48.22	0.1	0.1
Burundi	190	33.33	0.05	0
Cambodia	138	40.39	0.18	0
Cameroon	155	47.70	0.04	0.4
Canada	7	31.50	0.1	18.2
Cape Verde	38	-	-	0.3
Central African Rep.	180	61.33	0.09	0.1
Chad	200	-	0.09	0
Chile	12	57.47	0.19	3.9
China	39	40.30	-	2.2
Colombia	23	57.14	0.08	1.4
Comoros	79	-	-	0.1
Congo	108	-	0.05	0.5
Costa Rica	11	45.88	0.24	1.4
Côte d'Ivoire	175	36.68	0.06	0.7
Croatia	8	29.00	0.07	4.6
Cuba	9	-	0.17	2.8
Cyprus	6	-	0.08	8.2
Czech Rep.	5	25.40	0.16	12.5
Dem. People's Rep. of Korea	55	-	0.03	8.5
Dem. Rep. of the Congo	205	-	0.06	0.1
Denmark	4	24.70	0.32	9.9
Djibouti	143	-	0	0.6
Dominica	15	-	0.23	1.3
Dominican Rep.	47	47.44	1.73	3
Ecuador	30	43.73	0.55	2.1

Table 3 (continued)
Foresightedness Index

Country Name	Child Mortality	GINI Index	Protected Areas as % of Surface	CO2 Emissions
Egypt	41	34.41	0.01	2.1
El Salvador	39	50.79	0	1.1
Equatorial Guinea	153	-	-	0.4
Eritrea	111	-	0.04	-
Estonia	12	37.64	0.12	12.6
Ethiopia	172	57.20	0.17	0.1
Fiji	21	-	0.01	0.9
Finland	5	25.60	0.08	13
France	6	32.74	0.1	6.9
Gabon	90	-	0.03	2.8
Gambia	126	47.80	0.02	0.2
Georgia	29	38.93	0.03	1.2
Germany	5	38.22	0.27	10.6
Ghana	100	39.55	0.05	0.3
Greece	5	35.37	0.03	9.7
Grenada	25	-	0.02	2.6
Guatemala	58	55.83	0.2	0.9
Guinea	169	40.30	0.01	0.2
Guinea Bissau	211	47.05	-	0.2
Guyana	72	44.58	0	2.1
Haiti	123	-	0	0.2
Honduras	38	58.97	0.1	0.7
Hungary	9	24.44	0.07	8.3
Iceland	4	-	0.1	7.7
India	93	37.83	0.04	1.1
Indonesia	45	30.33	0.18	1.3
Iran (Islamic Rep. of)	42	43.00	0.05	4.7
Iraq	133	-	0	3.3
Ireland	6	35.90	0.01	12
Israel	6	35.50	0.15	10.5
Italy	6	36.03	0.07	8
Jamaica	20	37.91	0.09	4.2
Japan	5	24.85	0.07	9.5
Jordan	33	36.42	0.03	3.1
Kazakhstan	99	31.17	0.03	7.8
Kenya	122	44.54	0.08	0.3
Kiribati	69	-	0.37	0.3
Kuwait	10	-	0.02	21.3
Kyrgyzstan	61	29.03	0.03	0.9
Lao People's Dem. Rep.	100	37.00	0.12	0.1
Latvia	21	32.37	0.13	3.3
Lebanon	32	-	0	4.4
Lesotho	132	56.00	0	-
Liberia	235	-	0.01	0.1
Libyan Arab Jamahiriya	19	-	0	10.9
Liechtenstein	11	-	0.38	6.1
Lithuania	9	36.33	0.1	4.4
Luxembourg	5	30.76	0.14	12.4
Madagascar	136	45.97	0.02	0.1
Malawi	183	50.31	0.09	0.1
Malaysia	8	49.15	0.05	6.3
Maldives	77	-	-	1.7

Table 3 (continued)
Foresightedness Index

Country Name	Child Mortality	GINI Index	Protected Areas as % of Surface	CO2 Emissions
Mali	231	50.50	0.04	0
Malta	5	-	0.01	7.2
Marshall Islands	66	-	-	-
Mauritania	183	37.33	0.02	1.2
Mauritius	19	-	0.08	2.4
Mexico	29	51.86	0.08	4.3
Micronesia (Federated States of)	24	-	-	-
Monaco	5	-	-	2.1
Mongolia	76	44.02	0.1	3
Morocco	44	39.50	0.01	1.3
Mozambique	197	39.61	0.09	0.1
Myanmar	109	-	0	0.2
Namibia	67	70.66	0.14	1
Nauru	-	-	-	11.2
Nepal	91	36.70	0.09	0.1
Netherlands	6	32.60	0.12	11.3
New Zealand	6	36.17	0.23	8.5
Nicaragua	43	60.32	0.13	0.7
Niger	265	50.54	0.08	0.1
Nigeria	183	50.56	0.03	0.3
Norway	4	25.79	0.06	9.3
Oman	13	-	0.11	7.6
Pakistan	109	32.99	0.05	0.7
Palau	29	-	0.09	12.6
Panama	25	48.50	0.2	2.1
Papua New Guinea	94	50.90	0.02	0.5
Paraguay	30	57.72	0.03	0.7
Peru	39	46.24	0.05	1.1
Philippines	38	46.09	0.05	1
Poland	9	31.60	0.09	8.2
Portugal	6	38.45	0.07	6.5
Qatar	16	-	0	70.1
Rep. of Korea	5	31.59	0.07	9.1
Rep. of Moldova	32	36.19	0.01	1.5
Romania	21	30.25	0.05	5
Russian Federation	21	45.62	0.03	10.3
Rwanda	183	28.90	0.15	0.1
St. Kitts & Nevis	24	-	0.1	2.4
St. Lucia	19	42.58	0.18	2.3
St. Vincent & the Grenadines	25	-	0.21	1.4
Samoa	25	-	0.04	0.8
San Marino	6	-	-	-
Sao Tome & Principe	74	-	-	0.6
Saudi Arabia	28	-	0.38	16.9
Senegal	138	41.28	0.11	0.4
Serbia & Montenegro	19	-	0.03	4
Seychelles	17	-	0.99	2.9
Sierra Leone	316	62.90	0.02	0.1
Singapore	4	42.48	0.05	14.7
Slovakia	9	25.81	0.22	7.8
Slovenia	5	28.41	0.06	7.9
Solomon Islands	24	-	0	0.4

Table 3 (continued)
Foresightedness Index

Country Name	Child Mortality	GINI Index	Protected Areas as % of Surface	CO2 Emissions
Somalia	225	-	0.01	0
South Africa	71	59.33	0.05	7.4
Spain	6	32.50	0.08	7.5
Sri Lanka	19	34.36	0.13	0.5
Sudan	107	-	0.05	0.2
Suriname	32	-	0.05	5
Swaziland	149	60.88	0.03	0.4
Sweden	3	25.00	0.08	6.2
Switzerland	6	33.13	0.18	6.2
Syrian Arab Rep.	28	-	-	3.3
Tajikistan	116	34.74	0.04	0.7
Thailand	28	43.15	0.14	3.3
The former Yugoslav Rep. of Macedonia	26	28.21	0.07	5.5
Timor-Leste	124	-	-	-
Togo	141	-	0.08	0.4
Tonga	20	-	0.06	1.2
Trinidad & Tobago	20	40.27	0.04	20.5
Tunisia	27	41.66	0	1.9
Turkey	43	40.03	0.02	3.2
Turkmenistan	87	40.76	0.04	7.5
Tuvalu	-	-	1.27	-
Uganda	124	37.36	0.2	0.1
Ukraine	20	28.96	0.01	6.2
United Arab Emirates	9	-	-	20.9
United Kingdom	7	35.97	0.21	9.5
United Rep. of Tanzania	165	38.16	0.3	0.1
United States	8	40.81	0.21	20.1
Uruguay	16	44.83	0	1.6
Uzbekistan	68	26.84	0.02	4.6
Vanuatu	42	-	0	0.4
Venezuela	22	49.53	0.61	6.5
Viet Nam	38	36.07	0.03	0.7
Yemen	107	33.44	-	0.5
Zambia	202	52.60	0.3	0.2
Zimbabwe	123	56.80	0.13	1.2

Notes

158 Compare: "All around us things change their identity. (…) Things flow smoothly into nothings. (…) A rose is a rose is a non-rose when its molecules change. (…) The growing human embryo passes into a living human being (…). We can put black-and-white labels on these things. But the labels will pass from accurate to inaccurate as things change. Language ties a string between a word and the thing it stands for. When the thing changes into nothing, the string stretches or breaks or tangles with other strings." Source: Bart Kosko, *Fuzzy Thinking. The New science of Fuzzy Logic*, Flamingo, An Imprint of Harper Collins Publishers, London, 1994

159 Age of Knowledge, Age of Information, or any other name that circulates freely these days: Age of Uncertainty, Age of Science, Age of Nihilism, Age of Massacres, Age of the Masses, Age of Globalization, Age of Dictatorships, Age of Design, Age of Defeat, Age of Communication, Age of the Common Man, Age of Cinema and Democracy, Age of the Child, Age of Anxiety, Age of Anger, Age of Absurd Expectations. Source: Jacques Barzun, *From Dawn to Decadence. 500 Years of Western Cultural Life*, Harper Collins, New York, 2000

160 The methodology for calculating the IKS (Index of Knowledge Societies) is explained in the Annex. However, it should be mentioned here that all this measurement effort has been done on an experimental and illustrative basis. Experimental, as while the Report is based on the belief that measuring assets, advancement and foresightedness of Knowledge Societies would be crucial for the discussion of the subject at hand, no one collects global data that address precisely the phenomena that matter here, e.g. cultural attitudes, level of creativity in school curricula, etc. Thus, proxy indicators have been chosen carefully for the Report. This has been done with full understanding of the difference that separates correlation and causation. The combination of indices in this measuring exercise might change in the future, as more directly relevant data become available. Illustrative, as the existing international statistical databases do not provide comparable information even on these proxies for a larger group of countries than the sample presented. Thus, there is an element of randomness in the choice of the 45 countries presented and that randomness is due to the availability of data for them in all of the chosen categories.

Litho in United Nations, New York
27742—April 2005—3,340
ISBN 92-1-123156-6

United Nations publication
Sales No. E.05.II.H.2
ST/ESA/PAD/SER.E/66

Knowledge society has become a household term these days. Yet in too many cases, the understanding of it remains erroneous or shallow. At the same time, deep transformative currents related to knowledge and its production and dissemination in society promise to change the world as we know it, perhaps in the historically short time of a few generations. We are witnessing the beginnings of this transformation and our understanding of the pattern of change will impact our policy choices, with very serious long-term consequences. That is why a profound understanding of knowledge societies, as they are emerging the world over, is of such great importance.

This Report maintains that humanity is not so much entering the "Age of Knowledge" as the "Age of Responsibility"; now that our world has learned how to mass-produce and mass-utilize knowledge, responsible policy choices are needed to steer us all towards a future in which knowledge is secured to support high levels of quality and safety of life for all people everywhere.

The Report also argues that an urgent and broad global debate is needed to formulate the right policies and create an environment conductive to their implementation. It attempts to delineate the parameters of such a debate by naming key concepts that may be useful for its fruitful conduct. These are, inter alia, the concept of people and information as the main assets of the knowledge society; the notion of institutional change to allow limitless development of people and information; the view that Information and Communication Technology (ICT) has inherent limitations as the force behind acceleration of the mass production of knowledge; the idea that the knowledge economy is a subset of the knowledge society and that the knowledge society can come to us in nominal, warped or smart form; the conviction that while the knowledge "to do" – the basis of technological innovations – is important, so is the knowledge "to be," "to coexist" and to "maintain developmental equilibrium"; the thesis that we urgently need a unifying central cultural thought for humanity; and the idea that the current tension between – on one hand – ICT and techniques for mass-production of knowledge and – on the other – society, can only be solved by the development of people as citizens and the development of democracy as a social institution.

Finally, the Report proposes an Index of Knowledge Societies and makes recommendations for governments and political and economic elites, as well as for the business, civil society, news media and academic communities.

9 789211 231564