

# INVENTING THE GLOBAL INFORMATION FUTURE \*

by

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**Abstract:** This essay analyses four possible outcomes of the transition to tomorrow's global information society. Using scenario building methods the essay describes and analyses the pathways the transitions may take, in the hopes of guiding pro-active thinking about the most desirable information and communication strategies for developing countries.

For developing countries the Information Revolution is the key to their future. Some will seize the opportunities presented and prosper, while others will hesitate and lag behind. Still other governments will vigorously resist change, and be shunted aside. Today, obtaining and using Information Technology (IT) effectively is a requirement for better education and health care at home, more competitiveness abroad, and more effective engagement with the global information society rapidly being linked together around the world.

It has been said that the future just doesn't happen, it has to be invented. The future is now **mainly an invention of the industrialized countries**. Through multilateral conferences, bilateral negotiations, joint public - private discussions and private meetings, the industrialized countries are urgently preparing for the information society of the next millennium. The G-7 countries, the most developed in the world, are unambiguous in their insistence on Information Technology's central role in their own future: "The smooth and effective transition toward the information society is one of the most important tasks that should be undertaken in the last decade of the 20th century." For its part, the OECD has taken this

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message to heart and prepared consensus documents carefully outlining specific steps their members should take to create a viable IT future.

The most powerful example to date of inventing the future is the recently-concluded World Trade Organization (WTO) treaty on basic telecommunications services. The G-7 countries, especially the United States, insisted that the future should be very different from the past in this key sector. The Clinton administration reasoned that rapid technological changes in the IT supply industries, the desire of large private consumers to reduce their costs, and the predominant position of American consumer companies, would permit the U.S. to **develop a strategy to successfully restructure the basic rules of the entire international** telecommunications regime. Their strategy was successful, and as a consequence of the telecoms pact adoption, the future will no longer be the same as it was before the Geneva accord in mid February 1997. The agreements reached in Geneva by nearly seventy nations will decisively shape the future contours and dynamics of the 500-plus billion dollar global telecommunications markets. Accounting for about 90% of international telecoms sales, the signatories agreed to play by new pro-competitive rules governing market access, ownership, and pro-market regulatory approaches.

The most developed industrialized countries originally approached these negotiations with the very clear recognition that the outcomes of this multi-year process would reshape the future. Yet despite the definitive nature of these talks, most of the world's poorest countries never got seriously involved in the process; 100 plus countries never participated at all. From the poorest continent, Africa, only 7 out of 50 odd countries participated seriously and made trade offers. Now that the negotiations are concluded, and the first stage is over, the implementation phase (the most difficult phase)

lies ahead. The completion of these global talks provide an opportunity to speculate about what the future of the world of international telecommunications and information may hold, especially for developing countries.

While the industrialized countries are more attuned to the IT future than are developing countries, it is senior managers in the poorest of the poor countries that most need to develop self-conscious strategies that maximize their access to new information technologies and services, with an even greater sense of urgency for their future.

This essay analyses four possible outcomes of the transition to tomorrow's global information society. It describes and analyses the pathways the transitions may take, in the hopes of guiding pro-active thinking about the most desirable information and communication futures for developing countries.

### **Why the Future is So Difficult to Predict in the IT Sector**

An old truism says "It is always very difficult to predict, especially to predict the future". This is particularly true in the IT sector today, since so many of the fundamental 'certainties' of global IT markets have become uncertain and discontinuous, making prediction difficult. The Information Revolution of industry convergence, digitalization, and cost declines poses huge challenges to IT managers worldwide because the changes they bring are extremely **fast-paced** and very **wide-ranging** across many sectors and countries. As award-winning business analyst C.K. Prahalad has warned managers, in today's fast moving world the dividing line between the present and the future is rapidly thinning.

For example, the Computer System Policy Project (CSPP), an association

of CEOs of the thirteen largest computer manufacturers in the U.S. report an extraordinary fact: 73% of their profits are earned from goods and services that were not yet on the market 18-24 months before. Another sign of hyper-acceleration -- Texas Instruments, the huge chip maker and manufacturer of consumer electronics has moved to a "6-8-6" marketing system. Previously the time required to move from R&D, to production and to sales took years. Today, the company requires only six months to get the product onto market, it remains there for eight months, and then is retracted from the market over the next six months as a new product is introduced.

It is not surprising therefore that corporations and governments have a difficult time predicting the future of the IT sector. Private firms struggle just to understand current conditions, to get their products to market, and 24 months seems an eternity. Governments find it difficult even to comprehend the current situation, and efforts to lay down a widely accepted public framework for future IT expansion prove problematic. Yet it is surprising that in the public domain -- newspapers and journals -- serious IT scenario building and forecasting is almost an overlooked subject. What is available in the popular press is often too hyperbolic or personalized. More serious work is done privately by companies and consulting firms, but even among these proprietary documents one finds far less detailed forecasting than one would expect from such a future-oriented industry. The few exceptions are prepared for big organizations like Cable and Wireless or the World Bank. And Wired magazine shows what could be done in this genre with its recent cover story.

As tough as it is to devise forecasts and scenarios and to employ them strategically in developing countries, there are highly compelling reasons for a sharper sense of urgency about the future of developing countries in the global information society. The stakes are very high and countries need to

plan for their IT future for several reasons. First, IT has already become a central factor in the conduct of modern economic and political life. Studies show its introduction does not occur automatically; it requires vision and leadership at every level of society. Unless LDC leaders provide a clear future-oriented IT strategy about how IT can serve economic and political priorities, then developing countries will be condemned to near-permanent second class citizenship.

Second, a future-oriented IT strategy is key because the shift toward a global information society is occurring at time when the gap between most LDCs and the industrialized world is growing; and the Information Revolution may well be accelerating the growth of the gap between the information have and have-nots. One World Bank economist wrote in a Bank publication that any talk of economic 'convergence' between rich and poor is completely misplaced. Between 1980-93, he points out, "more than one half of the developing countries had negative growth." Even for LDCs with positive growth, "in more than four-fifths of these countries growth rates were still lower than the average... the rates for many were still lower than the average (2.2%) registered by the high income countries." Even for Brazil, at those low rates it would take 33 years just to reach that country's own earlier peak earnings, and "487 years before it achieved the current income level of the high-income countries" (Which will themselves continue to grow).

Therefore, more LDC managers need to think strategically about developing their domestic IT capabilities if they are even to slow the increasing gap. At a minimum, this requires designing and actively pursuing a pro-active 'National Information Infrastructure' strategy that is explicitly geared to moving the country into the digital future. Without the rapid deployment of proactive national strategies to create 'wired economies', then

the world's poor countries will be pushed more and more to the bottom of the global information society.

Third, beyond the threat of marginalization, the IT revolution also brings the means to overcome marginalization. For perhaps the first time in the history of mankind, countries can choose to create the wealth they need to grow fast. Previously, wealth was extracted. It was mined and harvested from the mountains and subsoil. Gold, oil or rich fertile earth conveyed wealth to the citizens lucky enough to live above ample natural gifts. Now, with new global competitive conditions, what is found under a nation's land is less important than what is inside the heads of its citizens -- IT education and 'hi tech' training. Commodities, roads, and ports, are being replaced with knowledge, information highways, and teleports. These new resources can be created and installed anywhere in the world the government has the vision, will power, and long-term commitment to devise imaginative and effective ways to use IT to enrich its citizenry. History can now be driven more by active human choice, not merely the passive facts of geography. These changes are causing a paradigm shift in the way smart countries approach development.

A fourth reason for urgency is because as national governments operate today more and more within a tightly integrated global context, then IT has become both a **subject** of intense negotiation, as well as a **means** of bilateral and multilateral negotiation. LDCs must become more sophisticated about IT to obtain the best bargain when negotiating with transnational corporations or other governments. This includes anticipating future IT changes in order to obtain the best bargain possible in their negotiations with the international system.

Finally, the technological and commercial revolutions now require that governments **re-design their national** IT regulatory and legislative

frameworks to anticipate global change. Rapid technical changes quickly make the best regulations outmoded. Rapid change has become permanent. IT itself has altered some of the rock-solid 'certainties' of the modern international system, such as the certainties of state authority, the sanctity of borders, the subsidiary role of NGOs, etc. Politicians and policy-makers need to better understand future trends to redesign domestic institutions for greater flexibility.

### **Leading Issues for the Global Information Infrastructure**

While there are relatively few formal 'futures' exercises in the IT sector, leading organizations like the OECD, the World Bank, the Global Information Infrastructure Commission, the International Telecommunications Union (ITU) and others have identified top priority issues they judge to be crucial for the future evolution of global information and communications markets.

First, there is profound unease and concern among all players (public and private) about the lack of international agreement on the '**rules of the game**'. By international 'rules of the game' we mean the laws, regulations, norms, expectations, institutions and incentives of the international telecommunications and information system. Concrete examples include the WTO General Agreement on Trade in Services (GATS) negotiations in Geneva, the EU telecoms market liberalization rules, and the IPR discussions at the World Intellectual Property Organization (WIPO). Without agreed-upon rules there is chaos; and chaos often has the most serious negative consequences for the developing states.

The global rules of the game have become a serious concern mainly because global information markets have changed much more rapidly than



existing laws and regulations of the relevant international organizations. With change so rapid, rules quickly become dangerously outdated. Technology changes faster than rules, and rules once designed to promote efficiency and cooperation now hamper good service instead of helping.

In response, informal but 'unauthorized' de facto private practices spring up overnight to replace formal rules, but they can be contradictory in impact and partial in coverage. This leaves company managers and government officials uncertain and confused, with each company making up rules as they go, leading to further confusion and conflict. One result can be less investment and less innovation.

The second vital issue of great concern to powerful international actors is the degree of **competition** in global information markets. How much competition is enough, how should it be achieved, and at what price? "Degree of competition" matches standard economic definitions including shares of the market controlled by the top firms (monopoly, oligopoly, or competition); barriers to market entry and exit; and the extent of government intervention.

The meaning and importance of competition to the 'North' is often different from its significance to the 'South'. There are also differences between the U.S. and Europe. In the lead-up to the 1995 G-7 ministerial meetings in Brussels on the information society there were long debates between the U.S. and EU delegations, with the U.S. insisting that governments commit themselves to full scale 'competition', and the Europeans wanting a weaker, watered down version. The compromise was for "dynamic competition".

The differences are even greater between countries of the 'North' and 'South'. Some of these differences were identified at the Second Annual meeting of the elite private body, the Global Information Infrastructure Commission (GIIC) meeting in Kuala Lumpur in July 1996. The GIIC Commissioner

from Colombia, Fernando Restrepo, Chairman of the Board of RTI Television, said that "if competition connotes only "open markets", "free access" or "universal service", it is perceived negatively in some developing countries, since it generally means that strong multinational players take over local operators."

A nuanced "Northern" perspective was offered by GIIC Commissioner Ray Lane, President and Chief Operating Officer of Oracle, who attempted to define different kinds of competition in a policy context. He identified three kinds of competition as understood in different parts of the world. "1) free competition, which implied the destruction of current structures for new, freewheeling competition; 2) competition where incumbents with a favorable position are unwilling to open markets to competition; and 3) competition where no one organization has a dominant position, but there is a willingness to take risks and build new structures."

Other international disputes regarding competition arose at the Information Society and Development (ISAD) conference in South Africa in May, 1996, where representatives of leading industrialized countries pressed for competition for its own sake, while the developing countries insisted on defining competition as valuable to the degree it contributes to wider social goods. 'Competition' and 'cooperation' are both necessary for an equitable, efficient global information society to emerge. Their meaning and balance are contested and subject to sharp international debates; debating them with an eye toward future trends and outcomes is a fruitful approach.

### **Competition, Cooperation and Developing Countries**

Regrettably, while rule-making in the WTO and other organizations will continue to greatly shape developing countries' access to the valuable

resources they need to develop their IT systems such as capital and new skills, developing countries are inadequately represented within the ongoing series of conferences, negotiations and forums where the new rules of the global game are being debated and decided. They should be more involved to represent their unique interests. Global compacts constructed only by the rich and powerful --the information haves-- are unlikely to serve even their own long term interests if the information have nots are not invited into the room to shape those rules. Countries that do not participate in the rule-writing will be less likely to play by the rules after they are written.

### **Technologies for Better Understanding the Future**

As difficult as it is under chaotic conditions to understand one or more possible futures, there are several useful methods for doing so. They include trend projections, computer simulations, model-building, group consultation approaches like the Delphi Technique, and scenario building. In this report we concentrate on scenario building.

### **Scenario Building**

Scenario building is a means widely employed in companies and governments to concentrate the attention of managers on possible future outcomes, and to encourage them to consider their optimal responses. It has been widely used in industry, notably by Royal Dutch Shell which credits the technique with greatly enhancing its earnings and profits and is described in The Art of the Long View by former Shell forecaster Peter Schwartz. Its successes in the public sector are described in Changing Maps Governing in a World of Rapid Change, by Steven Russell, an excellent and compelling description of the use of scenario building in the Canadian government.

Developing countries use this approach as well. The South Africans employed scenario building in the early 1990s to help bridge the chasm between black, white and colored groups, and to point out the future benefits of cooperation and the costs of conflict. Malaysia developed a far-sighted "2020" vision, and the Nigerian private sector uses it today to foster greater public-private cooperation.

The main purpose of the scenario process is to develop and build support in an organization for common responses to possible future outcomes. **It is not used to predict the future**, but to sensitize decision-makers to a range of plausible futures they may confront. By so doing, planners hope to achieve outcomes they prefer, and to avoid outcomes they fear. Especially in uncertain times, when many of the most basic underlying factors that drive change are themselves changing, scenario building can be a very useful management technique in the public and private sectors. Scenarios are constructed by identifying relatively well-known, relatively invariable "driving forces and predetermined elements", as well as 'key uncertainties' that do vary.

## Constructing the Scenarios

### Driving Forces

Scenarios are driven by underlying forces that are expected to remain relatively consistent through time. We assume that for the four scenarios described below:

! technological change will continue but not necessarily at the same rapid rates as in the recent past (i.e. Moore's law may no longer hold);

! information will continue to create vast new wealth, but not equally -- inequality will continue to grow;

! commercial and technological convergence continues;

! the capacity of states and civil society to absorb and direct IT innovations will be severely stretched; and

! the **limiting factors** in the successful applications of IT will continue to be organization, training, leadership and 'vision', not money or technology.

### Critical Uncertainties

There are other elements which are much more difficult to anticipate:

! Which technologies will be dominant?

! What IT are consumers willing to pay for?

! Will world politics be stable or volatile?

! Will nations reach agreement on international 'rules of the game' for IT?

! Will IT markets be competitive, oligopolistic or monopolistic?

From these conditions flow other second-order questions:

! Will capital investment in IT rise or decline?

! Will sectoral growth be high or low?

! Will international organizations continue to support LDCs or not?

! Will the opportunities for participation and the distribution of

power in the international system spread or narrow?

### **Scenario Design**

For the sake of simplicity and transparency, the four scenarios are built mainly around **world telecommunications markets**. While we want to convey the contours and dynamics of all information and communications markets, from software to satellites, it would be much too unwieldy and impractical to try to construct scenarios of every single industry and every sub-sector of information and communications technology and services (ICTS). Therefore, we focus on the largest core market, the fully global, \$400 billion telecommunications market. Besides being the largest component of the GII, international telephony is also the backbone along which other ICTS services are transmitted, especially the Internet. It is also the most politically problematic domestic market since its workers and managers are at risk of losing jobs and status through competition-promoting reforms. It is the telecommunications market that has recently concluded unprecedented global agreements, but which remains highly sensitive to commercial, political and national security concerns.

Still, we recognize that this approach somewhat skews the scenario since there are very real differences between telecoms and other IT markets. Not all the elements of telecommunications competition and rule-making apply equally to other industries like software or computers. Still, providing a broad birds-eye view enhances our understanding of the stakes involved for LDCs and other players in the emerging GII. A useful complement would be to construct a separate scenario matrix for each major IT market - software, satellites, and so forth. Government officials could also use scenarios to model their own national level information policies.

Below in Figure 1 is a simple illustration that arranges the two central goals of competition and rule agreement as two dimensions of a four-cell matrix. At the top, "Agreement on Rules of the Game"; along the side, "Degree of Competition". They represent potential end-states in the evolution of the global information society.

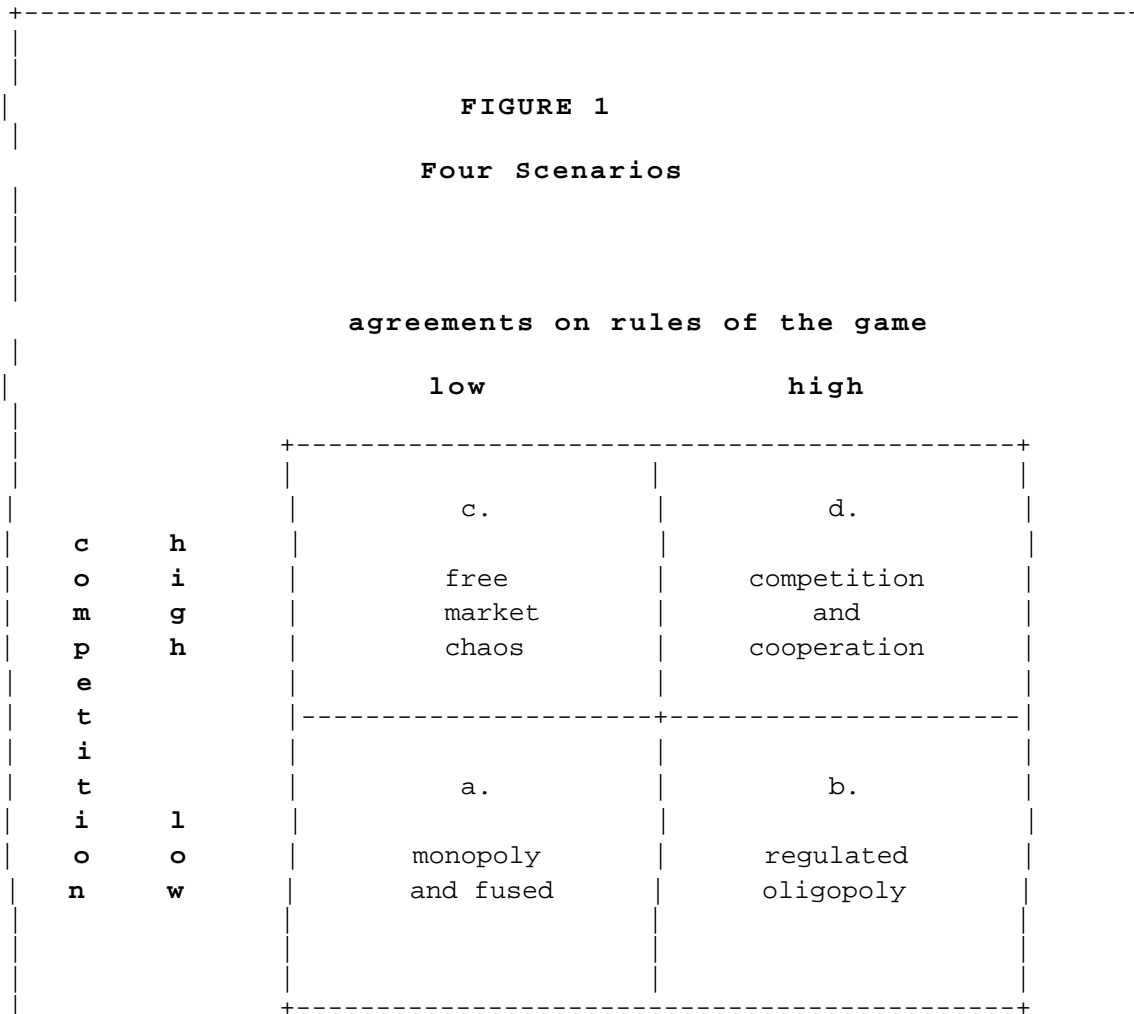
Each of these four cells -- **Monopoly and Fused, Regulated Oligopoly, Free Market Chaos** and **Competition and Cooperation** -- represents a very plausible future state of the Global Information Society. There is absolutely no guarantee that the world will settle into any one of these outcomes. Each alternative Cell is equally plausible, with differing opportunities for developing countries to win and to lose:

**Cell A**, the *Monopoly and Fused* scenario with low agreement and low competition, represents a world where regulatory, ownership and management structures remain fused and undifferentiated.

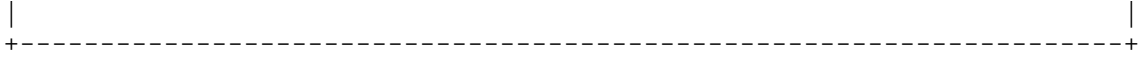
**Cell B**, the *Regulated Oligopoly* scenario with high agreement and low competition, indicates greater international agreement, but low levels of competition.

**Cell C**, the *Free Market Chaos* scenario with low agreement and high competition, shows more competition in global and national markets, but low agreement on the basic rules of the game.

**Cell D**, the *Competition and Cooperation* scenario with high agreement and high competition, has high competition and high rule agreement, maximizing both dimensions.







## T H E S C E N A R I O S

**CELL A: monopoly and fused  
low rules, low competition**

### **Summary**

This scenario provides a base scenario of low competition and low agreement on rules of the game. Almost all countries in this scenario still rely on monopoly suppliers for basic telephone services allowing limited competition in value added markets like cellular and paging. Domestically, most countries rhetorically commit to liberalization, and they seek modest regulatory and legislative reforms in their own domestic laws and institutions -- but the ownership, policy and regulatory structures too often remain **fused** in a single government ministry with only a few halting steps toward independent regulatory bodies. Internationally, negotiations on liberalization conclude successfully, but real operational results are much more limited. Governments are very hesitant to liberalize. There is considerable rhetorical commitment to liberalizing markets -- public and private sectors go on record committing themselves to greater openness, but they fail to implement. Both competition and agreement are relatively low **in contrast to what they could be under a more favorable future.** Not only are formal agreements left unenforced, but China and Russia's fast growing markets remain outside all international agreements altogether.

### **Driving Factors in this Scenario**

This scenario shares many features with today's global situation. It is still the case that outside the United States about 96% of the \$400 billion

international telecommunications market comes from countries with a monopolistic supplier or a supplier with a substantially dominant market position. These conditions will not disappear overnight, and this de facto immobility drives the scenario. There remain substantial national restrictions on market access, and copyright and intellectual breaches and disagreements are rampant. There are sharp and enduring conflicts over how best to promote cultural diversity without violating trade norms. Formal WTO accords were reached, but in this scenario the apparent WTO successes prove to be hollow victories. A positive scenario does not automatically emerge from today's high uncertainty.

One cannot exclude the possibility that both competition and cooperation could seriously deteriorate below even today's modest levels. Indeed, governments need to consider such a 'doomsday' or collapse scenario of bitter conflicts over the rules of the game, combined with far lower levels of competitive openness and exchange. Trade wars, collapsing value of IT firms on national stock exchanges and beggar-thy-neighbor policies result. The costs to LDCs of a collapse in both competition and in rules of the game would be enormous.

In summary form, in the 'Monopoly and Fused' scenario:

- ! Power of state-owned telecoms PTT managers remains high; they veto or slow expansion of national information systems.
- ! Public-private relations are mistrustful and hostile.
- ! Ideas of market expansion lose out to cultural and national protection.
- ! Islands of connectivity grow within global markets, but do not spread.
- ! LDC influence mainly in intergovernmental forums, but with little influence over investment and trade.

## T R E N D S

!	Technological Innovation	Low
!	Growth	Low
!	Investment	Low
!	Income Inequality	High
!	International Organizations' Support for LDCS	Medium

### **CELL B: regulated oligopoly**

**high rules, low competition**

#### **Summary**

The 'Regulated Oligopoly' world is one where LDC investment and trade stagnate, and regional blocs compete in a cartelized world of low competition but high agreement on conservative global rules.

Countries, international organizations and firms reach global agreements on key issues such as IPR, interconnectivity, and standards, but market competitiveness is low as companies pursue conservative market strategies, consolidating current niches and resisting aggressive technological and commercial expansion. New IT investment rates fall, including direct foreign investment (DFI), and IT sales to developing countries rise only slowly. With less investment, technological innovation drops and costs rise for the final consumer.

#### **Driving Factors in this Scenario**

These conditions result from endogenous factors within the IT sector and exogenous factors beyond. Externally, the IT sector experiences hard shocks from an overall macroeconomic slowdown, an eruption of conflict in large

unstable states like China and Russia, and the re-emergence of nationalism in Japan. These political changes increase investor worries and badly depress growth rates. The U.S. retreats further from global engagements.

Internally, the sector experiences discontinuities in the historical rates at which firms move products from innovation through commercialization to amortizing investments. Moore's law and other 'constants' change as new and unexpected threshold points are reached. The capacity of IT firms to easily process and master convergence and competition peaks and commercial progress slows to a crawl. Consumers react to 'information overload' and cut back their IT purchases.

With a market of regulated oligopolies, market-subverting government-to-government agreements multiply. Rules of market access, interconnections and IPR are more widely accepted - but so are cartels, restrictive agreements and closed markets. Markets are "opened" but only to special suppliers with political ties.

### **Implications for LDCs**

LDC governments recognize there is no guarantee that they will be effective participants in rule-making forums, and that global rules will not automatically reflect their concerns, putting them in double jeopardy as both markets and rules work to their disadvantage.

On the upside for LDCs, less multinational competition permits more niches for local private market entrants to get involved in IT activities. Favored with special privileges, local firms grow. Multilateral organizations like the ITU and the World Bank lend support to the LDCs, including more training.

On the downside, cartelization strengthens the hand of national PTT

managers who oppose job-threatening technological or policy innovation, risking further IT stagnation. A slowdown in global markets brings lower investment in marginal markets like Africa.

Larger LDCs with an IT export base grow less quickly, and/or are incorporated into regional cartels which greatly limit their freedom of maneuver. With more agreements on rules of the game, the IT sector witnesses the rise of many more restrictive commercial agreements designed to reduce or limit effective market competition. This includes anti-competitive regional blocks for Asia, the Americas, and Europe, built around a large regional champion. In this future convergence leads not to greater competition but to greater market concentration and control. The once-rapid growth of the IT sector slows, as companies seek to protect and defend their gains rather than seek new markets, products and competitive opportunities. Large oligopolies dominate global, regional and national markets. Domestically, dominant telephone service suppliers remain dominant with only minimal competition in core services. This is a slower, cartelized future where companies like Microsoft and Fujitsu control two thirds of global markets.

To summarize, the world of "Regulated Oligopolies" shows us:

- C A balkanized, cartelized GII. Parties prefer stability over risk, even if it means lower growth, stagnation for many. Risk aversion.
- C Diffusion of IT technology slows, occurs much more selectively.
- C Rule agreement on dividing up global markets controlled mostly by G-7 nations.
- C Big countries and big firms dominate local societies and global markets.
- C Regional blocs slow cross border investments, trade.
- C Capital investment in IT slumps.
- C Costs rise to consumers (or fall more slowly).

- C Strengthens the hand of domestic interests favoring continued dominance of single supplier PTTS.
- C Political conflicts explode over access, controls (especially U.S., U.K. vs. others).
- C 'Agreements' made mostly among the powerful states, companies, but some voice for LDCS.

**T R E N D S**

C	Technological Innovation	Low
C	Growth	Low
C	Investment	Low
C	Income Distribution	Medium
C	Support for LDCS	Medium
C	Power Distribution	Same

**CELL C: free market chaos  
low rules, high competition**

**Summary**

This 'Wild West' scenario occurs when market competition explodes with very aggressive private sector activities, accompanied by the failure of the major actors to reach agreement on the global issues. "Free market chaos" rules. IT investment flows and sales remain vigorous, but mainly to OECD countries and to the most secure and reliable markets in developing areas. Some LDCs complain of being ignored, while others complain of 'predatory' behavior unrestrained by good business norms or effective international dispute resolution mechanisms. Developed countries and their firms complain about unreliable national rules and unfair expropriation or broken contracts in LDCs. International organizations like the WTO and World Bank lose clout and legitimacy.

**Driving Factors in This Scenario**

In a series of unanticipated defeats, in Geneva, Brussels, and Rome, in global meeting after global meeting, the world's nations fail to reach agreement on IT trade and investment, copyright, encryption and intellectual property. Agreements signed on paper are not implemented. Not only do the developing countries fail to achieve satisfaction in these forums, but there are serious splits among the governments of Japan, the EU and the United States. China, excluded from the WTO and with aggressive new leadership, retaliates by refusing to adhere to intellectual property rights and encourages their factories to produce pirated CDs. Canada and France toughen their stance by restricting cross-border movement of foreign content, leading to severe Franco-American and Franco-British conflicts that poison relations among these countries. Russia's political deterioration makes it more difficult to reach agreements. Private firms pursue vigorous competition strategies. At the same time, in the absence of formal intergovernmental agreements, private firms create de facto international standards (as did Microsoft), and through coalitions of companies that establish industry standards.

Companies from industrialized countries rush to replace mature markets at home with fast growing ones, and invest in those LDCs with larger, more secure markets. Important for poorer countries, international development initiatives like the World Bank's InfoDev and international agreements through the WTO, collapse, reducing multilateral resources for IT development and hurting the most vulnerable. International stalemate occurs on many IT issues, deterioration on others. Thus a return to the unproductive vitriol and hostility of the 1970s "New International (Information) Order", with a severe North-South split. In weaker areas like Africa, with tenuous positions in international markets, individual countries' leverage is greatly diminished



since their membership in large international organizations counts for less as these bodies are weakened. Ignored by big states and big companies, in this future the smaller developing countries are hurt the most.

### **Implications for Developing Countries**

Consumers of information technology in developing countries can expect to benefit from falling IT prices and improvements in technology. With competition high, and firms seeking their own commercial advantage, sophisticated LDC managers try to play off one vender or investor against another in bargaining for IT market entry or expansion.

There are downsides in this scenario for developing countries. A breakdown of international agreement on rules slows investments in marginal markets as private firms fear Third World risks. A global system with cut-throat competition and disagreement on regulatory procedures is more subject to sharper business cycle booms and busts harmful to all actors. Also, the global environment allows bigger more powerful MNCs to gain leverage vis-a-vis poor governments.

Inability to decide on the timing of deregulation and privatization, on the extent of intellectual property rights coverage, or even technical standards for new technologies, harms political and commercial relations among nations. Disputes over IT issues bleed into other bilateral negotiations, with countries linking their failures to resolve differences in one area with their contested position in another, as has already occurred for example in IPR disputes between the U.S. and China.

A world of chaotic rules and frequent stops and starts disadvantages countries without adequate and sophisticated manpower to track constant rule changes and abrupt changes of course in international negotiations. The more

fragmented the international regime and its rules, the more costly and difficult it is for LDC managers to keep up with the changes, especially in critical areas like electronic commerce and electronic banking. "Cybercrime" grows exponentially, based in small, vulnerable LDCs that provide a haven for international criminals.

Stalemate or deteriorating international cooperation impacts on commercial conditions and competition as well. The negative impact will be especially severe in global markets for satellite services, among firms like Iridium and Teledesic that require basic agreements across many nations. Inability to reach agreement on cellular telephone standards proves costly, as between GSM and other systems.

Programs targeted to advance poorer countries' IT sectors, such as WorldTel or InfoDev lose support. A decline in commitments to management training will be especially harmful, since the key to successful NIIs is not just investment in hardware or software but in 'peopleware'. Their political and economic stability deteriorates and emigration flows grow.

In summary this scenario shows us:

- C The 'Wild West' revisited as international cooperation declines, and information and income gaps grow very wide, very fast.
- C Big powers can't agree on global rules either bilaterally or multilaterally.
- C Lack of collective leadership globally.
- C High uncertainty about overall global investing, and about national, local rules.
- C Produces islands of internet connectivity. Poorer regions bypassed by the information revolution.
- C Boom and bust pattern of investment, company performance.
- C Multimedia skyrockets in popularity.
- C Rapid product cycle, 'policy cycle.'

- C LDC influence is very marginal.
- C Support for LDC IT training, etc. declines sharply.
- C Gradual breakdown of social order in some countries.
- C Cyber-crime explodes, low internet security.

**T R E N D S**

C	Technological Innovation	Low
C	Growth	Mixed
C	Investment	Mixed
C	Income Distribution	Worsens
C	Support for LDCS	Low
C	Power Distribution	Skewed

**CELL D: competition and coordination  
high rule, high competition**

**Summary**

Under these conditions countries seek ways to capture the benefits and meet the challenges of high competition and high rule agreement. The combination of substantial competition and widespread rule agreement accelerates capital investment, innovation, the creation of new greenfield industries and the further radical restructuring of existing industries and the links and alliances among them. Customers get more choice, and better service, at lower prices.

**Driving Factors in This Scenario**

This scenario comes about through sustained, difficult and high profile negotiations in a variety of international forums, where the leading parties are able to reach agreement. Private industry associations accelerate agreement of rules governing internet standards and IT market access. The U.S. continues the leadership role staked out in the WTO talks. The G-7

governments reach common accords, and agree to reach out to the developing world in the design of the global information society. Nations in the developing world also exercise new independent leadership to advance their interests while seeking common cause with industrialized countries, and more liberal relations with private sector firms. Because there is political agreement on institutional, regulatory and legal frameworks, these private firms expand their investments.

### **Implications for Developing Countries**

The positive experiences of residential telephone users in Chile and Argentina, corporate customers in Europe and small and medium sized businesses in the U.S. support the claim that a wide range of consumers and suppliers benefit from growing market competition. The positive demonstration effect encourages more LDCs to liberalize markets and regulatory systems.

With agreements on IPR, this scenario brings an explosion of new media content in a variety of forms. The cinema industry grows within developing countries, and finds markets in other LDCs and in the industrialized world. Trade in content in many forms -- CD ROMs, book publishing, cinema and Internet traffic -- accelerates globally. Prompted by international and interfirm agreements over e-cash and EDI, the volume of world trade grows substantially.

In short, while all countries gain, it appears that developing countries gain the most from this D Cell scenario, since it provides the greater certainty (rules) and the greatest growth (through enhanced trade and investment) required to halt the precipitous slump to a world divided into the information haves and have-nots.

There are indications that countries are seeking the upside gains of the

D scenario. The acceleration of private companies creating or joining commercial consortia to establish internationally accepted standards of operation, manufacture and interconnection attest to the need that leading corporations feel for greater rule agreement globally. One can infer the same from the number of meetings and conferences among a wide range of countries, from industrialized to developing, at which both competition and rule agreement are central.

On the other hand, accelerated rule and market growth substantially threatens the status of the powerful PTT managers, perhaps producing a political backlash against further LDC market liberalization and PTT commercialization. For example, accelerated job losses in the PTT sector poses severe political problems for LDC national governments.

There will be some continued nationalist backlash against accelerated exports of foreign cultural artifacts through a variety of media. One could especially expect this kind of backlash against the world market leader, the U.S., which has 75% of the \$100 billion global software industry (Germany and Britain are the next largest with only %10 between them).

Countries marginal to markets and rule making will find it difficult to stay abreast of future changes if indeed the rate, breadth and depth of change truly speeds up. But greater cooperation with the industrialized countries and higher earnings encourages them to create programs for training, capacity building, subsidized loans, and so forth.

This scenario brings:

- C Re-balancing of telecommunications and information technologies.
- C Public-private sector relations more harmonious and cooperative, complementary.
- C Prices fall to final consumers.

- C Markets open to world suppliers.
- C Basis of 'knowledge' defined as requiring collective input, interpretation; joint production of knowledge.
- C High rates of interconnection.
- C Participatory rule making.
- C Investment spreads to many LDC markets.
- C More training of LDC officials in, e.g. regulatory reform.

**T R E N D S**

C	Technological Innovation	High
C	Growth	High
C	Investment	High
C	Income Distribution	Better
C	Support for LDCS	High
C	Power Distribution	More Positive

**Getting From Here to There: The Future is Path Dependent**

For the sake of analysis we have treated the four scenarios as separate and discrete. In the real world, they are combined and interconnected. Indeed, for governments and firms, the path to the future(s) is as important as the destination. The transition from the current rules and market conditions to the new end-state conditions will profoundly shape the future state of the global information society. History, even future history, does make a difference -- Japan is a market society and Italy is a market society, but their unique histories have given them very particular rules and very particular forms of the relations between market and government. The future is heavily path dependent.

For example, even if we assume that CELL D is the preferred target and is reached successfully, will the path of least resistance go easily and steadily on the diagonal from Cell A to Cell D? Or will the global system move more circuitously, and first pass through the less desirable and more

difficult Cell C or Cell B before reaching destination D? Senior policy makers need therefore to consider the implications for their countries of alternative paths to the future -- whether an A-C-B-D paths, an A-B-C-D path.

**Nor should we automatically assume our arrival at D. Some countries may be caught in B and remain there.**

Decision makers therefore should develop path scenarios for the transition, as well as destination scenarios. There are two critical aspects of path scenarios that should be considered.

First, **will the transition be fast or slow?** Will the powerful telecoms and communications actors gather themselves up and shift quickly out of our presently slow, fused and monopoly world in three years, or will it take the system thirty years to make a full and complete transition? On the answer to this question hangs the national plans and the corporate strategies of countries and companies. Some companies will make the correct analysis, and they will prosper; others will make the wrong analysis, assuming three years of transition when it is thirty, and their fortunes will suffer. Similarly with governments.

Second, **will the transition be fractured or coherent?** We can imagine a future in which countries make the transition at roughly the same pace, moving in roughly similar directions. For example, while France and Senegal have very different starting points, they nonetheless move steadily toward Cell D with similar levels of commitments. This is a coherent transition. We can also imagine a more fractured transition, a more likely one, in which countries move toward their own 'Nirvanas' at very different rates, with very different levels of commitment, and probably with very different Nirvanas. Along this path -- or these paths -- uncertainty is greater, and some countries move toward and eventually occupy virtually every

quadrant of the matrix. In this world, the global information society becomes very complex and contradictory, with an extended 'transition' that may go on for decades.

### **Other Scenarios**

There are several other ways to conceive and design IT scenarios. We noted above that scenarios could be constructed for each IT industry - one separate scenario for computer hardware, another for software, etc. One could also create separate 'customized' multi-sector transition scenarios country by country. Also, while we described the four scenarios above as distinct alternatives for the GII as a whole, they can also be seen as co-existing simultaneously as different sub-areas or neighborhoods in the global information society, with some countries already operating under "Competitive and Cooperative" conditions, while others remain in AMonopoly and Fused@ circumstances.

There are other scenarios beyond telecommunications. For example, the Secretary General of the ITU, Pekke Tarjanne, recently proposed four scenarios for Internet development. They are:

- C The future will be much like today, "with incremental improvements in bandwidth availability and performance." Supply-demand balances would be the principal regulators.
- C The current Internet "will splinter into a series of interconnected, privately owned, parallel Internets that may be application-specific, and perhaps "each...owned by a service provider who will guarantee minimal level of service in return for a usage fee."
- C The net collapses under its own weight as more people leave in frustration than join as new subscribers.
- C Some new core information infrastructure emerges perhaps based on other protocols and better services. These different scenarios will have different impacts on developed and developing countries.



Walter Baer of the RAND Corporation has conjectured about possible institutional responses to the emerging conditions of international convergence and competition. He foresees three possible scenarios based on the form of international coordination that emerges -- international coordination mainly through national-level initiatives; coordination through formal international organizations; or coordination through less formal, specialized private standard-setting coalitions. His scenario-building reminds us that an important component of cooperation and rule-making will be strengthening appropriate international institutions through which developed and developing countries can work effectively together for common purposes. LDC access to international resources will differ substantially under each scenario; LDCs will find it more difficult to monitor and influence change under the third Baer scenario, for example.

Barbara Cross hypothesizes information futures in her work on "Netciety". Instead of alternative futures, she discusses a single possible future, sketching the evolution of global information society, describing it from the vantage point of the year 2010. She divides the world into four groups. While in her analysis these groups are meant to co-exist simultaneously with one another, we can also consider them as alternative scenarios for some countries in the South. There are:

- C countries "so threatened by internal chaos that only tiny pockets of connectivity have been established;
- C those where governments had refused to accept the consequences of connectivity in terms of increased transparency of government and decentralization of power and had therefore limited access to a few privileged or acceptable constituencies;
- C those which recognized the benefits of connectivity to economic and social development but were nonetheless aware of the threat posed to traditional culture and which attempted to develop and apply technologies to limit access to information considered inimical to the maintenance of national characteristics and social stability; and

C the majority which had embraced access to the global information highway as a means of enhancing the development potential of their citizens; these still faced substantial development problems but could envisage the possibility of their solution." (p 5, Rath)

## CONCLUSION

Developing country national IT managers should not underestimate the synergies created from market expansion and rule agreement, which is at the heart of this project's scenarios. On the one hand, wider agreement on the **rules of the game** can provide a boost to competition. New rules, agreements and institutions can:

- C provide more reliable and timely **information** about markets;
- C **reduce uncertainty** about the behavior of other competitors, strategic allies and regulators;
- C better structure **rewards and the punishments**; and
- C **define property rights** and responsibilities of various actors in the global market/society.

In other words, agreeing on rules of the game will clarify expectations governing core competition activities - market entry and exit; competitive/anti-competitive behavior; foreign vs. domestic ownership rights.

As a consequences of greater certainty about the behavior of other firms or governments, and about their own rights and responsibilities (including dispute resolution), private investors are more likely to significantly **expand their investment**, including in new technologies.

Conversely, **greater competition can impact positively on rule making**. For example, the growing size of the market likely to result from growing competition will expand the size of the pie available to all actors. Growth provides the economic surplus to create win-win, positive sum outcomes, and hence reduces cutthroat competition and pressures to cheat, shirk or otherwise bend and break international rules in a shrinking market. Slower or negative growth is more likely to produce dog-eat-dog zero-sum behavior, and

to block progress on devising rules of the game. Furthermore, enhanced international competition is also likely to expand the number of private sector consortia seeking inter-firm agreement on rules, especially on international standards. This can create a richer texture of international cooperation that complements (and may replace) slower government-to-government arrangements. Thus, greater competition and greater rule adherence can be complementary. Whether this positive outcome occurs will depend in part on the quality of leadership among the main actors.

The conclusion of the WTO talks certainly does not mean the end of the invention of the future; this is not the 'end of history'. In important ways, this is just the beginning of a possible future, but the hard work lies ahead.

**Through this on-going iterative process, conflicts over access to the magnetic spectrum for broadcasts, access to capital, access to orbital slots for satellites and rules in standards-setting remain to be continually managed and resolved.** Even the WTO agreements are only agreements on paper, and the actual contours of the future hinge on translating paper accords to actual practice. If that practice can be equitably designed and implemented, the entire global information society can benefit.

Developing country officials should not underestimate the costs of their exclusion from global rule negotiations, nor the costs of refusing to make their domestic economies and regulatory structures more flexible, open and competitive. As the core developed and developing countries of the WTO group reach a global deal incorporating 95% of the world's telecoms markets, the other non-participants risk finding themselves marginalized and their national IT systems under-capitalized and uncompetitive. The stakes are high. The most positive path ahead is greater LDC proactive engagement in the invention of

the global information future. When this happens, the entire global information society will benefit.

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