How International Broadcasting + the Internet Can Change the World

by

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[Presentation to the Challenges for International Broadcasting meeting, hosted by Radio Canada International. Montreal, May 21-24, 2000.]

Good afternoon.

We are at the beginning of a new global communication system when the combination of international broadcasting and the emerging global Internet can create opportunities for international cooperation that would have seemed a miracle, beyond imagining, to any earlier generation of statesmen.

The global Internet is growing exponentially, at 80%/year, and will reach about 300 million users in 200 countries in the second half of this year.[2] In the for-profit sector it is being driven by what the Economist s Frances Cairncross has called the best-educated group of entrepreneurs ever to blitz a business [3] and is already producing a new generation of billionaires. There are equivalent opportunities for public sector entrepreneurs, and later in this presentation I will suggest initial projects that can accelerate progress and build a solid foundation for a culture of peace.

The start of a linkup between traditional international broadcasting and the emerging global Internet can be seen in the initiatives of several international public broadcasters attending these meetings and the 3,691 radio stations, 277 television stations, and 1,544

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[2] Robert Kahn and Vinton G. Cerf, What Is The Internet (And What Makes It Work). Unpublished m s., December, 1999, p. 2. Available at www.policyscience.net.

[3] Frances Cairncross, The Death of Distance: How the Communications Revolution Will Change Our Lives (Boston, MA: Harvard Business School Press, 1997), p. 118.

automatic Webcams (ranging from private Girlcams to four 24 hour/day cameras viewing Mount Fuji) [4] [5] that are live on the Internet, and available worldwide. Internet broadcasting now originates in a majority of the countries of the world (Table 1).

The first generation of Internet television tries to push too much video. The result is a small 2" by 2" window that is jerky and murky. My remarks today are based upon a more modest prototype created at Yale's School of Public Health with support from UNESCO, WHO, and private foundations (http://info.med.yale.edu/EIINet). It used audio and an image (a speaker's slides) every 2-3 minutes that could be transferred as compressed files[6] and it brought overview lectures from the world's leading researchers, and a common cognitive map, to 140+ countries.[7]

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[4] Data are from http://www.comfm.com. See also www.broadcast.com, a commercial Webcaster that provides services for a wide range of clients.

[5] For a current English-language guide to 68 Webcams in Japan, see http://web.kyoto-inet.or.jp/people/hiroshi1/cam-eg.htm. The number of private Webcams probably is underestimated: www.comfm.com (above) lists only 15 Webcams in Japan.

[6] There were experiments with real-time multicasting, but most of the audiences received compressed files (with transcripts) for time-shifted viewing and Email discussion that were available within a day of the presentation in New Haven. The regularly scheduled broadcast "meetings" were designed to engage a global audience as part of a wider organizing effort to monitor, understand, forecast, and prevent emerging infectious diseases and two faculty members and a teaching assistant also were available to respond to questions and discuss research issues. Simply archiving lectures on-line (lacking the broadcast and interactive elements) would not have been as effective. See, for example, the initial lecture by Dr. Ruth Berkelman at http://info.med.yale.edu/EIINet. Dr. Berkelman was able to present a new initiative from the Center for Disease Control to several thousand health professionals worldwide: global Webcasting was more efficient than just issuing a government report, writing a journal article, or spending months jetting to international meetings to make the same announcement. The multimedia component also helped Dr. Berkelman to convey a sense of herself, which probably was a valuable contribution to the ability of international audiences to respond to the US proposal - i.e., to understand the people they would be working with, alongside the formal US government position.

[7] Dr. Robert Ryder at Yale Medical School had overall responsibility for the initiative; Ms. Lindsey Holaday (lindsey.holaday@yale.edu) directed the technical team. Thanks are due to Dean Michael Merson at Yale's School of Public Health, to Dr. Joshua

This prototype took advantage of PC-based technology that permits institutions to record and digitize their own programming in standard form. Internet-based compression also changes the math and efficiency of international broadcasting: one hour of broadcasting no longer requires one hour: now, the 6-8 megabytes/week of a one-hour colloquium series can be distributed worldwide in about one second over standard transponders and satellite links of the former USIA s WorldNet or other carriers. Today, one hour = one second.

The vision to create these global multimedia applications requires a marriage between the original commitment of international public broadcasting and the Internet. Today, the Internet is still a print culture: most of what people do is to read Web pages. And noncommercial Web sites can be insular, do your own thing and post it, projects without the bold political vision of the founders of international public broadcasting. International broadcasting also is a unique profession: after several years of work, I can report that much of what you do every day makes most people nervous: international broadcasting seems that it would be too big, too complicated, and too expensive. It is something that nobody knows how to do; they would not know who to call; nobody they know does it; nobody in their organization (yet) talks about doing it . . . And only a few people really started to push, during the past year, just to create a Web site!

Lederberg and his international planning group, supported by UNESCO, which recommended the initial evaluation, and to UNESCO, WHO, and the Lounsbery and Sprint Foundations for financial support.

Table 1
Radio Stations, Live on the Internet (April, 2000)

- Africa
  - Algeria (4)
  - Angola (3)
  - Benin (1)
  - Egypt (1)
  - Ghana (1)
  - Ivory Coast (1)
  - Mauritius (1)
  - Morocco (2)
  - Senegal (2)
  - South Africa (5)
  - Sudan (1)
  - Tanzania (1)
  - Tunisia (1)
- Americas
  - Antigua (1)
  - Argentina (23)
  - Bahamas (1)
  - Bolivia (2)
  - Brazil (94)
  - Canada (172)
  - Chile (9)
  - Columbia (3)
  - Costa Rica (3)
  - Dominican R. (1)
  - Ecuador (4)
  - Grenada (1)
  - Haiti (1)
  - Honduras (1)
  - Jamaica (2)
  - Mexico (33)
  - Neth. Antilles (1)
  - Panama (13)
  - Paraguay (5)
  - Peru (4)
  - Puerto Rico (6)
  - Saint Lucia (1)
  - Suriname (1)
  - United States (2087)
  - Uruguay (3)
  - Venezuela (1)
- Asia & Middle East
  - Afghanistan (1)
  - China (12)
  - Cyprus (10)
  - Hong Kong (9)
  - India (4)
  - Indonesia (8)
  - Iran (10)
  - Israel (10)
  - Japan (10)
  - Jordan (1)
  - Korea (10)
  - Kuwait (3)
  - Lebanon (6)
  - Oman (1)
  - Pakistan (1)
  - Philippines (5)
  - Saudi Arabia (1)
  - Singapore (13)
  - Sri Lanka (2)
  - Taiwan (8)
  - Thailand (11)
  - Turkey (17)
  - Un. Ar. Emirates (1)
  - Vietnam (1)
- Europe
  - Armenia (2)
  - Austria (18)
  - Azerbaijan (1)
  - Belarus (1)
  - Belgium (16)
  - Bosnia (3)
  - Bulgaria (6)
  - Croatia (7)
  - Czech (30)
  - Denmark (6)
  - Estonia (7)
  - Finland (7)
  - France (74)
  - Germany (74)
  - Greece (31)
  - Hungary (16)
  - Iceland (5)
  - Ireland (25)
  - Italy (50)
  - Kazakhstan (3)
  - Kyrgyztan (2)
  - Latvia (8)
  - Lichtenstein (1)
  - Lithuania (6)
  - Luxembourg (1)
  - Macedonia (4)
  - Malta (2)
  - Moldova (1)
  - Monaco (2)
  - Netherlands (26)
  - Norway (12)
  - Poland (21)
  - Portugal (23)
  - Romania (11)
  - Russia (42)
  - Slovakia (6)
  - Slovenia (25)
  - Spain (17)
  - Sweden (13)
  - Switzerland (31)
  - Ukraine (9)
  - United Kingdom (63)
  - Vatican (4)
  - Yugoslavia (8)
- Oceania
  - Australia (54)
  - New Zealand (10)

Source: /www.comfm.com
April 2, 2000.

Exponential improvements of technology will continue. The science is solid, the famous Moore s Law (that the power of microprocessor chips will double every 18 months without an increase in price) seems likely to continue until about 2017.[8] [Today a terabyte of on-line memory for storage and retrieval of international public broadcasts in an Internet Public Library would cost about $150,000 - in three years, probably $30,000.] For the long-run integration of 30 frame/second television broadcasting and the Internet most of the critical technical thresholds have been achieved and are already in the stores in consumer DVD players and on desktop PCs equipped with DVD. (The remaining challenge is to build the larger pipelines that can supplant 56K modems with at least 400K connections or beyond. A long list of already-invented solutions will work - new wires, cables and wireless. The global space segment of the Internet will launch in the near future, with hundreds of low-earth-orbit (LEO) satellites providing direct wireless links worldwide, at prices to be competitive with physical-wire and -cable connections.[9] New geosynchronous satellites, the initial launches of new LEO links, the completion of new fiber-optic submarine cables (and advances in photoelectronics) will add **500%** to transoceanic telecom capability between early 1999 and the end of 2001.) [10]

II. Implications

What will this mean? In part, it will mean whatever people (and especially people in unique positions to provide knowledgeable and visionary leadership, like the international public broadcasting community) create it to mean.

[But first - before suggesting several ideas - a question: Would it be valuable for international public broadcasting to acquire a terabyte of on-line memory and save its best

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[8] Gordon Moore, An Update on Moore s Law, September 30, 1997. http://www.intel.com/pressroom/archive/speeches/GEM93097.HTM.

[9] John Montgomery, The Orbiting Internet: Fiber in the Sky, *Byte*, November, 1997, pp. 58-61, 64, 66, 68, 70, 72. For current plans see International Bandwidth 2000 (Washington, DC: Telegeography Inc., 2000).

[10] International Bandwidth 2000, op. cit. and http://www.telegeography.com/Publications/cmap99.html. Transoceanic bandwidth prices have been falling 50% - 60%/year on competitive routes: http://www.telegeography.com/Publications/ib00_overview.html. For emerging global Internet architecture see Hubs + Spokes: A Telegeography Internet Reader (Washington, DC: Telegeography Inc., 2000). INTELSAT and other carriers are developing plans for an expanded global network of Internet servers.

programming? And organize it by topic? It could be a worthwhile project to begin this fall, and a useful catalyst to creative thinking by many institutions.]

Concerning specific ideas: [11] [12]

- For global policy: In the United States, a Reinventing Diplomacy in the Information Age advisory group (including several former Directors of USIA from both parties) recently proposed an Internet-based Global Affairs Channel.[13] It would acquire programming of international interest from many sites internationally and make it available (without charge) to desktop PCs in all countries.[14] The traditional practices of diplomacy were created for a world of absolute monarchs who conducted international relations by the court protocols of the age of the Congress of Vienna (1814-1815). The world does not yet have an adequate global communication system for policy development in a world of democracies, and we recommended that a Global Affairs Channel is a step in the right direction.

Beginning in just the US and Canada, we quickly identified dozens of leading institutions who would be interested to participate and to submit programming, in standard

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[11] Each idea, and related projects, are discussed in more detail in an appendix of the printed version of this presentation, Five Internet Projects That Can Change the World, also available at http://policyscience.net.

[12] I do not want to dwell, in these remarks, upon racism and hate groups but I think it is important to recognize that the political freedom of the emerging global Internet can - and will - be used for many political goals. The question is not whether it will be used to foster hatred and racism - that is being done. The question is which spirit, and which values, will prevail. E.g., International Action Urged to Drive Racists Offline, by Belinda Goldsmith, Reuters, January 27, 2000, 11:25 AM E.T,

[13] Richard Burt and Olin Robison, co-chairs, Reinventing Diplomacy in the Information Age: A Report of the CSIS Advisory Panel on Diplomacy in the Information Age (Washington, DC: Center for Strategic and International Studies, 1998), pp. 70-71. The Project Director was Barry Fulton. Appreciation is due to the Annenberg Foundation for financial support.

[14] A draft plan is available at http://policyscience.net.

format, at their own expense.[15]

- For science: I suggest a global Tuesday brownbag (brownbag = lunch meeting in American) - an Inventions Wanted series for the entire international scientific community. Leading research scientists can brief their colleagues about what they are trying to do, their current ideas - and where they are stuck - for example, in developing a malaria vaccine, or photovoltaic or synthetic fuel research . . . In the Lederberg Report (UNESCO) we suggested the potential contribution of the emerging global Internet to scientific innovation might be spectacular. This would be a good project to test the idea.

I also think that Inventions Wanted . . . would be a popular program: The Internet permits broadcasting that links-up many niche markets: we might be surprised at how large the niches can be.[16]

- For education: A good initial project would be a regularly-scheduled global research

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[15] I.e., if it was truly a high quality channel that government and NGO professionals would find worth their time This means (also) not overloading an audience of busy people: perhaps one hour/week in any field would be a good target, and 15-20 hours/week for the Channel.

A pioneering assessment, with case studies and lessons, of new communication technology and emerging global policy networks has been directed by Wolfgang Reinicke and Francis Deng with support from the World Bank and United Nations: see www.globalpublicpolicy.net.

[16] A Renewable Energy Research Channel, bringing the best and latest ideas from all sources, as quickly as possible (usually 1-2 years before print publication) might be a worthwhile later step to accelerate scientific innovation in addressing an urgent global problem.

Recommendations for deriving income from scientific research channels (including early estimates from a study by the Sloan Foundation) are available on our Website.

Leading scientific societies, the International Council of Scientific Unions (Paris) or UNESCO scientific advisory committees may be willing to select high quality programs of international interest.

The flood of scientific (print) publications in a few advanced countries is a drought almost everywhere else. Funds for travel to international scientific meetings also are restricted (for academics and companies) in many countries. These channels can help to bridge the gaps and assist competitive equality: relying even upon print publications can place companies one- to two- years behind the state-of-the-art discussions and the creative process.

colloquium to improve foreign language instruction, especially with applications of computers. Strengthening our ability to learn one another's languages sends the right message; it could produce improvements for all countries and new on-line resources.[17]

- For health: an International Public Health channel could make international broadcasting a daily partner, with health professionals worldwide, in a commitment to high quality medical care for everybody, in all countries.[18]

- For culture, an International Cultural Affairs Channel might begin by acquiring six hours/year of their best programming from at least one leading cultural institution (e.g., a national museum or art gallery) in each country. The channel could be underwritten by a simple funding mechanism to receive the philanthropy of globalizing corporations and banks - including, especially, the international communications industry - and others. Six hours/year/country of audio/slide tours of special museum shows, performances by

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[17] If this prototype is successful, the next steps could be regularly-scheduled research colloquia to improve reading - and all school-age subjects, including science. It is likely that the World Bank will soon announce a commitment to universal primary education, so new on-line educational resources will be timely. [See also James Wolfensohn, "Let's Hear Everyone and Get On With Imaginative Solutions," International Herald Tribune, January 28, 2000 and his judgment that "Our challenge is to move beyond the rhetoric and recognize that we live in a time of astonishing possibility. Whether it be immunizing all children from preventable disease or linking every school in Africa to the Internet, solutions to problems which seemed insurmountable just a few years ago are now within reach."

I would suggest adding human rights: there is a growing worldwide interest to develop curriculum in human rights, especially with a psychological orientation: a crossroads program, bringing different materials and approaches from many locations to a growing global network of interested public school educators could help to build a movement.

[18] To start: it would be highly prestigious for different leading medical schools to be invited by WHO to extend their Global Grand Rounds lectures in particular medical specialties to a global audience, and not expensive. The Yale prototype suggested 1.5 hours of a technician's time was required to digitize 1 hour of audio, plus 30 minutes to digitize and upload 20-30 slides, with hourly rates (US universities) at $35 - $65/hour.

In the United States the Internet already has been used by our National Institutes of Health and the Association of Academic Health Centers to distribute sessions of a major international conference on women's health. An unexpected development, that eventually added several hundred thousand listeners, was the interest of local radio stations to retrieve selected lectures and panel discussions from the Website for time-shifted broadcast over traditional radio. (Dr. Roger Bulger, personal communication.)

indigenous peoples, or lectures - that's 1,000+ hours of high quality international cultural programming/year. From everybody and available to everybody.[19]

In closing, I am reminded of a belief in the early days of the Cold War that jazz and rock-and-roll would secure foreign audiences, who then would stay tuned for the news programs, which would have the major political effect. But soon, programmers began to realize that rock-and-roll was a political argument: it conveyed to many generations of young people behind the Iron Curtain the nature of freedom. Likewise, with creativity and a light touch of leadership, the combination of international public broadcasting and Internet capabilities can become a political argument for the benefits of peace, democracy and international cooperation.

[Attachment: Five Internet Projects That Can Change the World]

[19] An initial $10,000 to acquire authoring technology, and $5,000 in each subsequent year, should be enough for 6 hours/year, although the grants for new projects could expand greatly as global philanthropy begins to grow. Once a resource is available anywhere on the Net, it is available worldwide (and, in principle, forever!) - and thus a combination of international broadcasting and the Internet should be an efficient and attractive philanthropic priority to companies that operate globally.

For wider coverage of national current events, it may be possible for journalists to identify or establish efficient capture points in each country: one model might be the lectures at the National Press Club in the US.