Global Social Transformation

All of us, as a society, are witnessing an extraordinary historical transition between the Industrial Age and the Information -- or Digital Age.

When a society's fundamental technologies change and its economy begins to transform, the political and social institutions inevitably follow.

In this new era, nothing will be as important as education. The current educational systems of the developed world -- suited to the requirements of the masses of the Industrial Age -- is becoming obsolete. We, and our children, need to be prepared.

With multimedia personal computers, learning will become interactive and individualized.

The man-in-the-street and politicians alike are asking the same questions -- where are we and where are we going?

From a flyer of TELECOM Interactivity 97 of ITU

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Distinguished delegates, Ladies and Gentlemen.

It is my great honor and privilege to have this opportunity to describe our "Global University System (GUS)" project along with "Globally Collaborative Environmental Peace Gaming" project, for which I have been working in the past three decades.

My wife, Hisae, and I greatly appreciate ETC's kind and generous invitations to this very exciting and well organized symposium. Thank you very much, indeed.

Global University System (GUS) - #I

The Global University System (GUS) is a worldwide initiative to establish broadband Internet infrastructure for enhancing e-learning and e-healthcare across national and cultural boundaries for global peace.

The philosophy of GUS is based on the belief that global peace and prosperity would only be sustainable through education. The prime objective is to achieve "education and healthcare FOR ALL," anywhere, anytime and at any pace.

Global University System (GUS) - #2

GUS aims to create a worldwide consortium of educational and healthcare institutions and NGOs, particularly benefiting those in remote/rural areas of developing countries for the eradication of poverty and isolation.

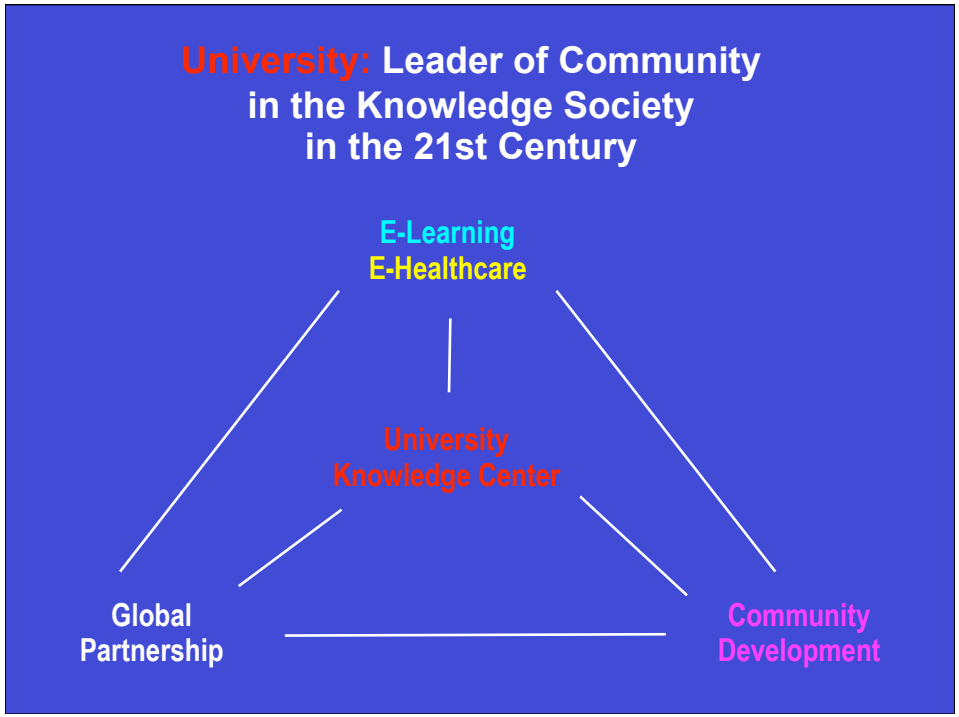
Learners in those countries will be able to take their courses, via advanced broadband Internet, from member institutions around the world to receive a GUS degree.

Both the learning (students or lifelong learners) and teaching (professors) societies of partner institutions will also form a global forum for exchange of ideas and information and for conducting collaborative research and development with the emerging global GRID computer network technology.

Thus, the higher education institutions will close the digital divide, act as the knowledge center of their community and lead their development.

Philosophies and Principles of GUS

- Transcultural, globalwide initiative
- The GUS to demonstrate moral leadership
- Priority on academic freedom
- The GUS to stress quality education
- Initiative to be shared with students
- Transnational collaboration on research
- Commitment to openness
- Toward transcultural unity-in-difference



Mission of GUS: GUS aims to build a higher level of humanity with mutual understanding across national and cultural boundaries for global peace.
The mission of GUS is to help higher educational institutions in remote/rural areas of developing countries to deploy broadband Internet in order to close the digital divide.
These institutions act as the knowledge center of their community for the eradication of poverty and isolation through the use of advanced Information and Communications Technologies (ICTs).
A GUS education thus hopes to promote world prosperity, justice, and peace, based on moral principles rather than political or ideological doctrines.

Goal of GUS: The GUS is a world-wide initiative to create satellite/wireless telecommunications infrastructure and educational programs for access to educational resources across national and cultural boundaries for global peace.
The GUS helps higher educational institutions in remote/rural areas of developing countries to deploy broadband Internet in order for them to close the digital divide and act as the knowledge center of their region for the eradication of poverty and isolation.
Education and job skills are the keys in determining a nation's wealth and influence. The GUS education thus will promote world prosperity, justice, and peace, based on moral principles rather than political or ideological doctrines. The aim is to achieve "education for all", anywhere, anytime.

Activities of GUS: GUS has group activities in the major regions of the globe in partnership with higher learning and healthcare institutions. They foster the establishment of GUS in their respective regions, with the use of an advanced global broadband Internet virtual private network. Those institutions affiliated with GUS become members of the GUS/UNESCO/UNITWIN Networking Chair Program located at the University of Tampere in Finland.
Students in these regions will be able to take their courses, via advanced broadband Internet, from member institutions around the world to receive a GUS degree.
These students and their professors from participating institutions will form a global forum for exchange of ideas and information and for conducting collaborative research and development.

Background and Rationale #1

- The Internet, with its rapidly expanding and improving infrastructure, will be the main telecommunication media of tomorrow.
- The full potential for achieving revolutionary advances in education and healthcare in developing countries cannot be realized with the currently available information delivery infrastructure and at currently prevailing market prices.

Background and Rationale #2

- Improved e-learning requires much better ways of presenting information and of enabling learners to interact with facilitators to enable the learners to process that information into personal knowledge.

- What is needed is both high quality audio/video delivery and high quality interactivity.

- Developing countries need broadband Internet via international satellite and fiber-optic cable.

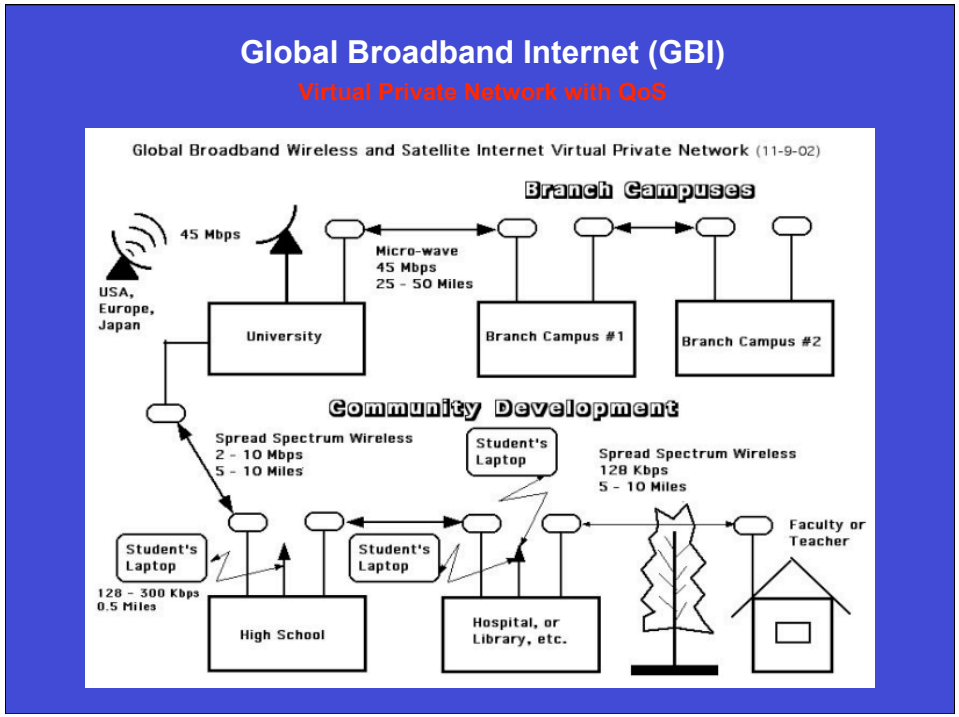
Expected Benefits

- Consortium member universities will be able to build the network of facilitators for support of e-learners,
- Learners may take one course from a university of different country to get his/her degree from the GUS, thus freeing them from being confined with one philosophy of a university and a country,
- The broadband Internet will enable web-based teaching with more interaction among/between learners and instructors compared with less interaction in replicating class-room teaching via analog broadcasting satellite, -- thus stimulating global dialogues among them to attain global peace, (continue)

Expected Benefits (continued)

- Learners and faculties at the member universities can promote exchange of ideas, information, knowledge and joint research and development of web-based teaching materials, community development, and many others locally, regionally and even in global scale,

- Researchers in even developing countries can perform joint collaborative Hi-Tech research and development on various subjects with colleagues in developed countries, e.g., Globally Collaborative Environmental Peace Gaming, micro-biology, meteorology, chemical molecular study, DNA analysis, 3D human anatomy, etc.



1. Satellite linkage:

GUS will be based on regional satellite hubs, typically located at a major university, that connect via high-speed satellite (~ 45 Mbps) to educational resource cites in the E.U., U.S., and Japan. In a sense, the regional satellite hub is to be the major Internet Service Provider (ISP) for not-for-profit organizations in the region, and the gateway to the outside world.

2. Microwave linkage:

Regional hubs link to branch campuses or other regional educational institutions via micro-wave (~ 45 Mbps) over relatively short distances (25-50 miles), if optical fiber network is not readily available.

3. Community Development Network:

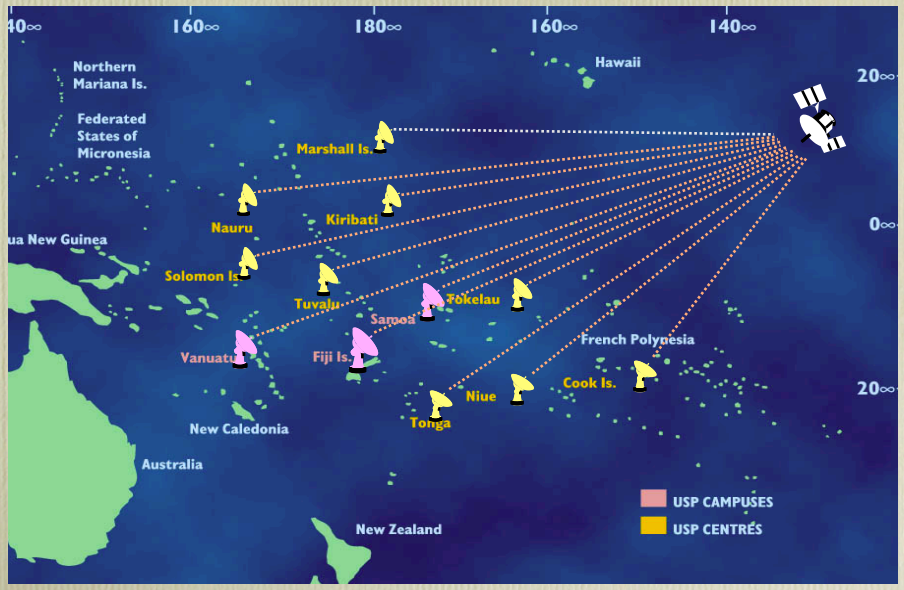
Communication from the hub and branch campuses to local sites, over distances up to 10 miles, is to be achieved by spread-spectrum wireless (~ 2 -10 Mbps) Internet networks, which do not require licenses in most countries.

4. Wi-Fi connection:

The buildings with a broadband Internet connection will then also become relay points for the low-cost "Wi-Fi (wireless fidelity)" networks at 10 Mbps that are now rapidly appearing in Japan, USA and Europe.

This advanced wireless communication with laptop computer will make e-learning possible for anyone, anywhere, and anytime with capabilities of Internet telephony, fax, voice mail, e-mail, Web access, videoconferencing, etc. This is not only to help local community development, but also to assure close cooperation among higher, middle and lower levels of education.

USPNet VSAT Network

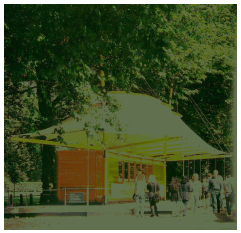


LINCOS (Little Intelligent Communities) or "Unwiring the World"

Foundation for Sustainable Development of Costa Rica
Institute of Technology of Costa Rica
MIT Media Lab
University of Rochester

Hewlett-Packard, Microsoft, FTL Happold, Northsails, UTC, Becton-Dickenson, Wyle, V-Tel, **Tachyon**

Digital Town Centers



8-10 Computers
2 Printers, 2 Scanners
Cell phone base station (15 mile radius)
Smart card reader
Medical diagnostic bay
Analytical equipment as appropriate
External large screen (when available)
VSAT satellite connection

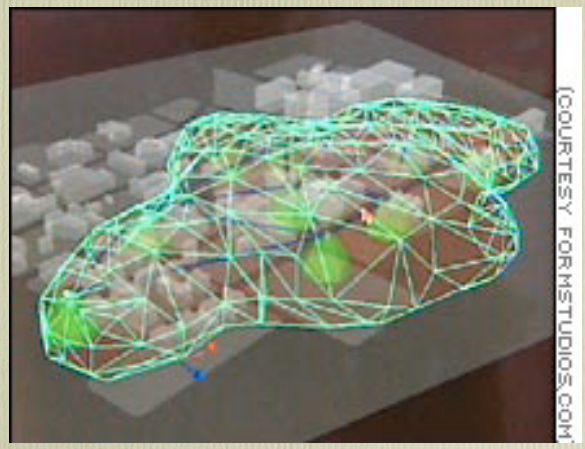
Purpose: to provide a multi-purpose information center for isolated regions, with high-speed (40 Mb/s) internet access and integrated local wireless communications, at affordable cost for developing nations

Telemedicine
Agricultural extension services
Environmental monitoring
Education

Computer Lab
Electronic Commerce
Banking
Digital Services

Microwave Network among Hawaiian Islands

WiFi Cloud



This 3-D animation shows the wireless "cloud" over downtown Athens, Georgia. The project is aimed at attracting new users and creating new content for wireless laptops and PDAs.
“Wireless 'cloud' may offer silver lining; Or is it just 'pie-in-the-sky' technology?
CNN.com/SCI-TECH; July 31, 2002
http://www.cnn.com/2002/TECH/science/07/31/coolsc.wireless.cloud/index.html

Inventor of Wireless

Ms. Hedy Lamarr

The Improbable Inventors of Frequency-Hopping Radio

She was gorgeous, glamorous and talented. And she had a mind for technology. In 1941 actress Hedy Lamarr, along with the avant-garde composer and musician George Antheil, filed for a patent to cover their "Secret Communication System," a device designed to help the U.S. military guide torpedoes by radio signals that would continually jump from one frequency to another, thus making enemy interception and jamming difficult.

Born Hedwig Maria Eva Kiesler in Vienna, Austria, Lamarr may have gotten the idea of "frequency hopping" while she was married to Fritz Mandl, an armament manufacturer who sold munitions to Adolf Hitler. Through a marriage arranged by her parents, Lamarr was Mandl's trophy wife, and she accompanied him to the many business dinners and meetings, where, unbeknownst to the participants, she silently learned about Axis war technology. After four years with Mandl, Lamarr, a staunch anti-Nazi, fled to London, where MGM's Louis B. Mayer "discovered" her and convinced her to move to the U.S.

In Hollywood she met Antheil, who helped her figure out a way to synchronize the frequency hopping between the radio transmitter and receiver. Their invention, which they gave to the U.S. government for free, called for two paper rolls, similar to those used in player pianos, punched with an identical pattern of random holes. One of the rolls would control the transmitter on the submarine while the other would be launched with the receiver on the torpedo. Though ingenious, the device was deemed too cumbersome for use in World War II.

Still, the seminal idea of frequency hopping lingered. By the late 1950s U.S. Navy contractors were able to take advantage of early computer processors for controlling and synchronizing the hopping sequence. Since then, the U.S. military has deployed more sophisticated techniques with ever faster processors in costly, classified devices, including satellite communications systems. And today the technology has become widespread in cell phones and in personal communications services (PCS), among other civilian applications. —*D.R.H.*

HEDY LAMARR, the Hollywood actress, was the co-recipient of a patent (*inset*) for basic technology that is now widely used in cell phones and personal communications services (PCS).

"Spread-Spectrum Radio" by David, R. Hughes and Dewayne Hendricks, *Scientific American*, April 1998, p 94-96

Mobil Learning Era

The evidence is overwhelming that mobile learning (m-Learning) is beginning to take hold:

- Over 50 percent of all employees spend up to half of their time outside the office.
- More than 75 percent of all Internet viewing will be carried out on wireless platforms by 2002.
- Mobile devices will outnumber landline PCs by 2002 and exceed the 1 billion mark the following year.
- More than 525 million web-enabled phones will be shipped by 2003.
- Worldwide mobile commerce market will reach $200 billion by 2004.
- There will be more than 1 billion wireless internet subscribers worldwide by 2005.

Connotations

❊ WIRED	❊ WIRELESS
❊ Slave	❊ Freedom
❊ Crime	❊ Flexibility

E-mail and multimedia World Wide Web of Internet so far contributed significantly to the world society on the dissemination of information. The next phase of the Internet development with global neural (or GRID) computer networks should be the globally collaborative experiential learning and constructive creation of wisdom with interactive actions on virtual reality simulation models of joint global research and development projects on various subjects.

Globally Collaborative Environmental Peace Gaming
through
Global Neural Computer Network

- **Need: Kyoto Protocol**
- **Computer Simulation Models**
  - **Socio-Economic-Environment Model**
  - **Climate Simulation Model**
- **Beowulf Mini Supercomputer**
  - **Maui Community College in Hawaii**
- **Global Neural (Grid) Computer Network**

This will promote trustful friendship among youngsters around the world to realize the Knowledge Society of the 21st century, and their collective creativity will enlarge the size of pie for stakeholders to reach peaceful win-win consequences. Senator Fulbright once said that learning together and working together are the first steps toward world peace.

Characteristics of Virtual Learning Community

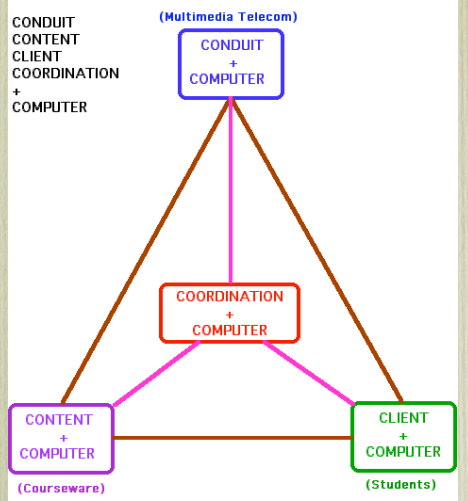
- collectively creates knowledge, using computer-mediated communications and global resources;
- enables individuals, regardless of their race, gender, or class, to produce, access and interact with information in ways that are compatible with their needs;
- embraces the characteristics of each culture represented and includes them in the new cultural fabric;
- respects different perspectives and promotes diversity of thought;
- seeks and develops commonalities in experience and purpose (Feyten 1999:4).

Benefits of Virtual Learning Community

- **Enrichment of social life in a community:** a Social Web can offer the opportunity for people to co-enjoy new forms of culture, entertainment, and leisure.
- **Creating and sharing knowledge in a community:** a Social Web can help to organize the exchange of the wealth of knowledge and experience in local and world-wide communities outside of market mechanisms.
- **Reducing social isolation in a community:** a Social Web can support people in finding others with similar interests, needs, and goals, thereby expanding a person's social radius independent of geographical bounds (Tschang 2001:257).

FIVE "C's" OF ELECTRONIC DISTANCE EDUCATION

CONDUIT
CONTENT
CLIENT
COORDINATION
+
COMPUTER



Here, the use of computer with broadband Internet is emphasized, rather than analog broadcasting of replicating conventional classroom.

7Cs Recommendations

UNDP's Human development Report

- more connectivity: setting up telecommunications and computer hardware;
- more community: focusing on group access, not just individual ownership;
- more capacity: building human skills for the knowledge society;
- more content: putting local views, news, culture and commerce on the Web;
- more creativity: adapting technology to local needs and opportunities;
- more collaboration: developing Internet governance to accommodate diverse national needs;
- more cash: finding innovative ways to fund the knowledge society.

Financing

- During the Okinawa Summit in July of 2000, Japanese government pledged US$15 billion to close the digital divide in developing countries and for the eradication of poverty and isolation.
- During the G8 Summit in Canada in June of 2002, and at the Environment Summit in South Africa in September of 2002, they also pledged another US$2 billion to aid education and healthcare in developing countries, respectively.

Financing (continued)

- GUS projects will combine (1) the Japanese government's Official Development Assistance (ODA) funds and (2) Japanese electronic equipment with
- (a) the Internet technology and (b) content development of North America and Europe,
- to help underserved people in rural and remote areas of developing countries by closing the digital divide.

GLOSAS Projects

(GLObal Systems Analysis and Simulation Association in the U.S.A.)

http://www.friends-partners.org/GLOSAS/

Click "Current Reference Websites" in this home page.

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