

**State of the Art Report:
UT-LANIC's Development and its Role in Latin American Studies**

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State of the Art Report: UT-LANIC's Development and its Role in Latin American Studies

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Abstract

This paper presents the recent development of the University of Texas—Latin American Network Information Center (UT-LANIC) and its role in Latin American Studies in the context of global diffusion of the Internet. This presentation introduces three new services: (1) interactive posting mechanism that makes it possible for Latin Americanists to announce their electronic publications on UT-LANIC automatically; (2) e-mail interface to UT-LANIC Servers that enables millions of users without full Internet connection to use their e-mail to access not only our Gopher/WWW services but also the entire Internet world; (3) searchable indexing of Latin American region and Latin American studies sites worldwide.

UT-LANIC's Development

The objective of UT-LANIC is to provide Latin American users with access to academic databases and information services throughout the Internet world, and to provide Latin Americanists around the world with access to information on and from Latin America. UT-LANIC is sponsored by the Andrew W. Mellon Foundation and the Ford Foundation, and managed by the Institute of Latin American Studies (ILAS) at the University of Texas at Austin. During 1990–1995, under Director Peter S. Cleaves ILAS placed emphasis on defining its role in the information technology revolution in Latin America, and assigned a high priority to UT-LANIC's development.

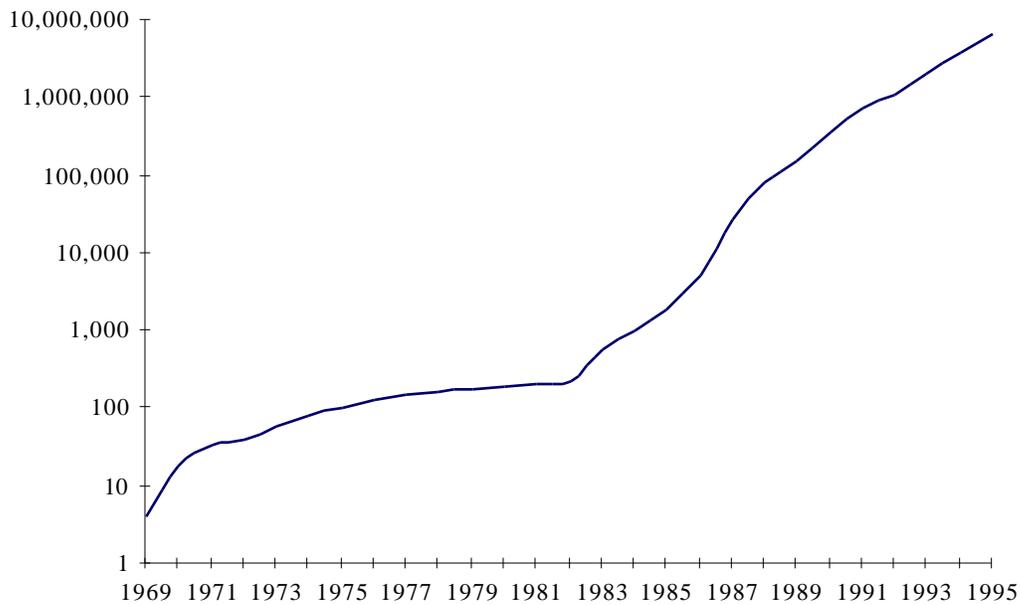
In the process of UT-LANIC development, the author has served as Technical Director of the Center, and has been responsible for design and implementation of this Latin America-oriented Network Information System. The theoretical and technological foundations of UT-LANIC's creation and early development were provided and documented in the author's dissertation.¹ The purpose of this section of the paper is to update UT-LANIC's recent development in terms of UT-LANIC usage growth in the context of global diffusion of the Internet.

During recent two decades especially in the 1990s, the information and communication technology revolution has been profoundly changing the nature of scientific communication in terms of two dominant advances. One is the rapid development of the international

¹ Ning Lin, "Diffusion of Information Technology: A Case Study of Computer Network and the Role of Government, Industry, and Academia in Developing the Internet/NREN" Ph.D. Dissertation, University of Texas at Austin, 1993.

computer networks that has linked over 40 million Internet users worldwide as shown in Figure 1, and over 200,000 Latin American users as shown in Figure 2. Another advance is the availability of large public on-line databases and information services, especially the Internet Gopher and the World Wide Web (WWW) services, as shown in Figure 3. The combination of these two advances provides a good opportunity for developing countries to access a universal body of knowledge and for area studies scholars to access regional information, through international networks at low cost. Electronic integration into the informatics revolution will accelerate the scientific and economic advancement of these countries.

Figure 1 Growth of Internet Hosts (log scale), 1969–1995

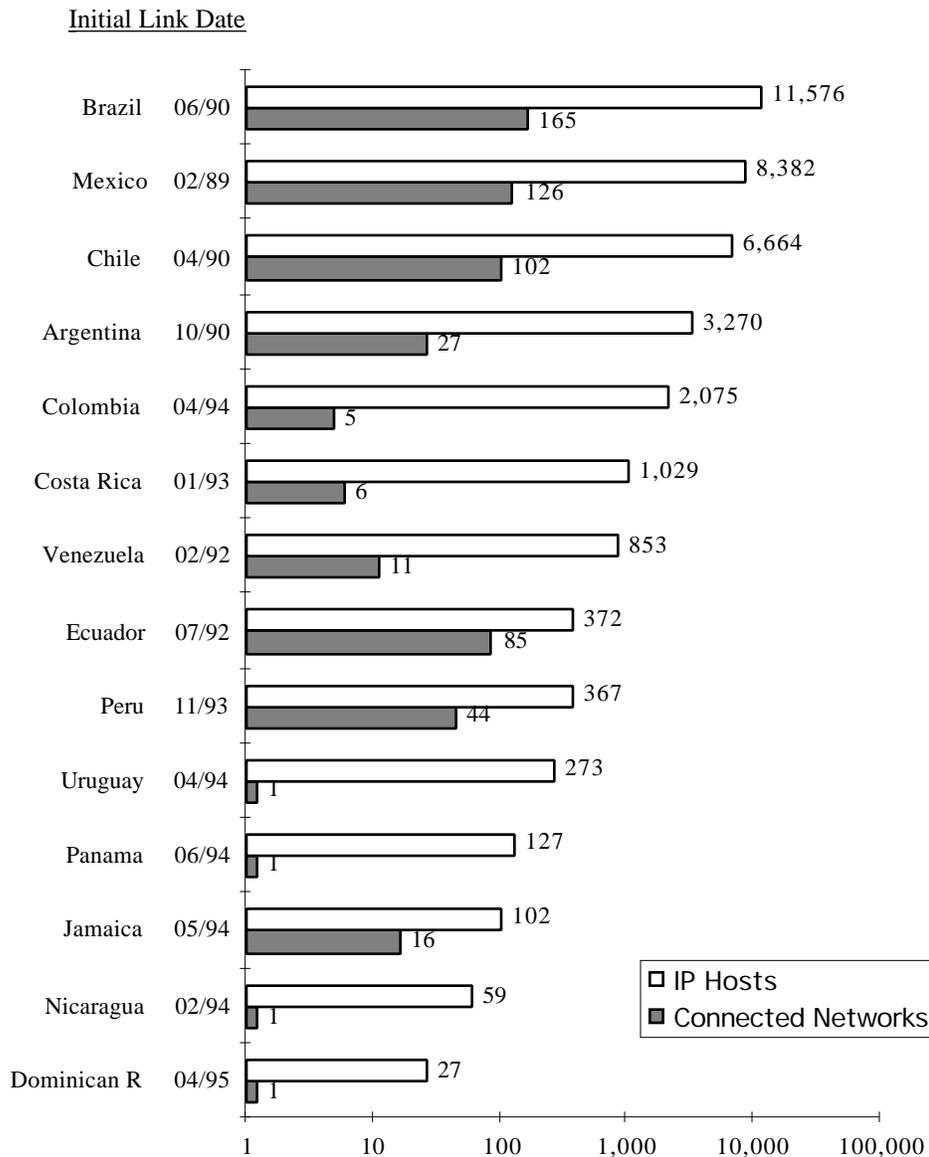


ARPANET
Created

Internet
Formed

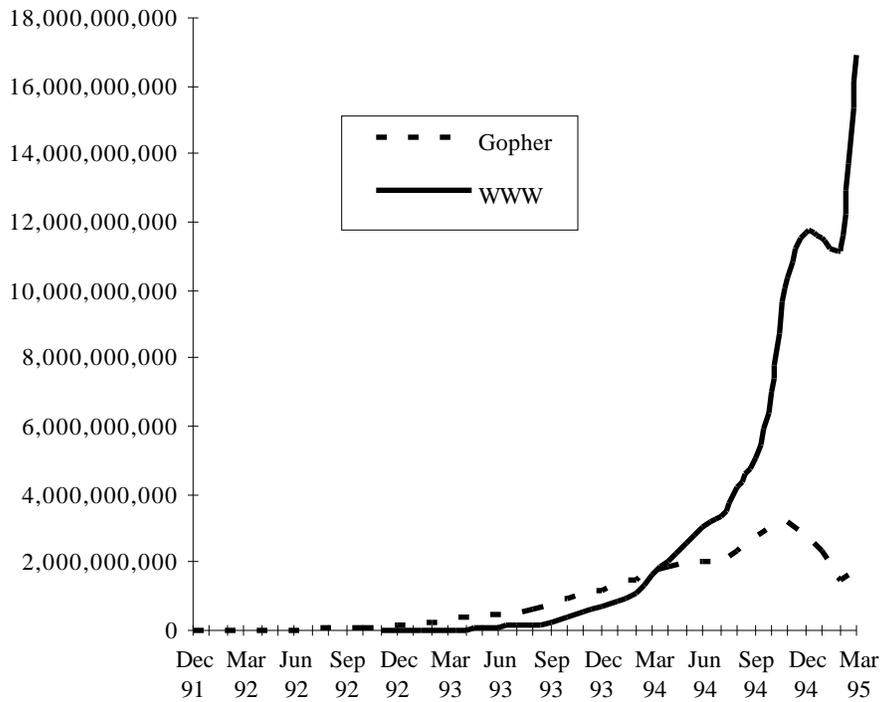
Source: Prepared by the author, based on the data from Bolt Beranek and Newman Inc. *A History of the ARPANET: The First Decade*, Report No. 4799. Arlington, VA: Defense Advanced Research Agency, 1981; Lottor, Mark K. "Internet Growth (1981-1991)." *RFC1296*, 1992; and Network Wizards, *Internet Domain Survey*, <http://www.nw.com/zone/WWW/top.html>, 1992-1995.

Figure 2 Internet Hosts and Networks in Latin America Ranked by Country (log scale), 1995



Source: Prepared by the author, based on the data from NSFNET/Merit Network Information Center, *NSFNET Networks by Country*, <ftp://nic.merit.edu/nsfnet/statistics/nets.by.country>, May 1, 1995; and Network Wizards, *Internet Domain Survey*, <http://www.nw.com/zone/WWW/dist-bynome.html>, July 1995.

Figure 3 Gopher and WWW Usage (Packets), 1991–1995



Source: Prepared by the author, based on the data from NSFNET/Merit Network Information Center, *NSFNET Networks by Country*, <ftp://nic.merit.edu/nsfnets/statistics/1991-1995>

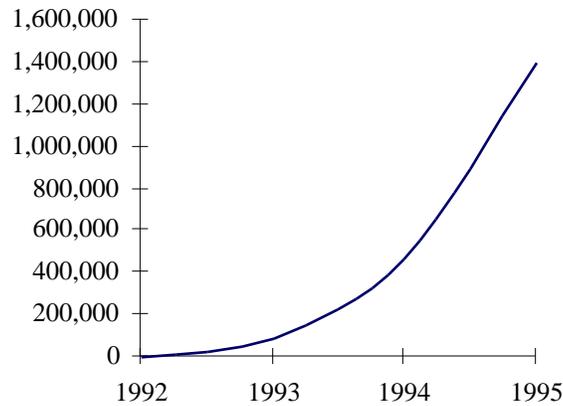
In reality, however, a wide information gap exists between developed and developing countries, due to two obstacles in taking advantage of these developments. The first is connectivity: lack of the Internet connection in some national computer networks in Latin America as shown in Figure 2. According to my time series forecasting model of the patterns of global diffusion of the Internet, over the next five to ten years, this hardware shortage will be relieved and virtually all of the major countries of the region will be connected to the Internet.²

The second, and more disconcerting obstacle is informational. Although more than 200,000 Latin American users and most Latin Americanists have connected to the Internet,³ many of them are not fully acquainted with the process involved in using their existing computer network to access useful international public databases, especially information services relevant to Latin American studies.

² Ning Lin, 1993.

³ Estimate based on the data in Figure 2.

Figure 4 UT-LANIC Information System Access, 1992–1995⁴



Source: Prepared by the author, based on the data available on UT-LANIC server.

Table 1 Distribution of UT-LANIC Service Usage, 1995

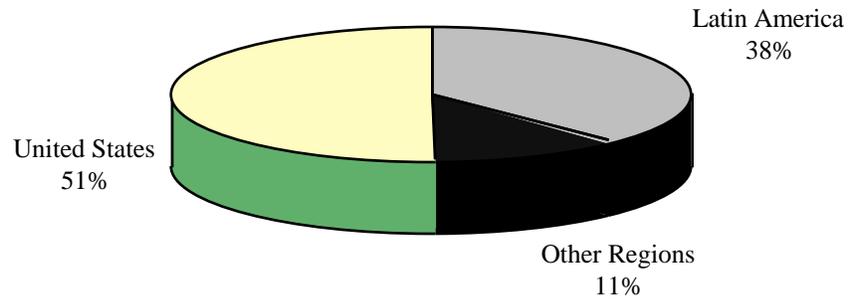
Usage Distribution	Percentage	Usage Distribution	Percentage
Argentina	3.52%	Guyana	0.31%
Barbados	0.42%	Haiti	0.62%
Belize	0.96%	Honduras	1.33%
Bolivia	1.84%	Jamaica	1.80%
Brazil	4.67%	Mexico	14.35%
Chile	2.12%	Nicaragua	1.85%
Colombia	2.14%	Panama	1.18%
Costa Rica	1.92%	Paraguay	0.45%
Cuba	5.77%	Peru	1.77%
Dominican R	0.93%	Suriname	0.33%
Ecuador	2.25%	Uruguay	0.50%
El Salvador	1.50%	Venezuela	5.45%
Guatemala	1.19%	Other Caribbean	0.26%
LA General/Topical	20.53%	Total ⁵	79.96%

Source: Prepared by the author, based on the data available on UT-LANIC server.

⁴ The statistics for 1995 is only available from January to August.

⁵ This means that about 80% users concentrates on accessing Latin American country and topical documents/databases through UT-LANIC.

Figure 5 Telnet Access to UT-LANIC by Region, 1994–1995



Source: Prepared by the author, based on the data available on UT-LANIC server.

Table 2 UT-LANIC Usage Distribution by Country of Origin among Latin American Users, 1994–1995

Users	Percentage	Users	Percentage
Argentina	4.76%	Jamaica	0.16%
Brazil	17.67%	Mexico	37.22%
Chile	8.35%	Nicaragua	0.23%
Colombia	1.84%	Panama	1.50%
Costa Rica	5.95%	Peru	0.86%
Dominican R	1.07%	Uruguay	1.17%
Ecuador	3.29%	Venezuela	15.88%

Source: Prepared by the author, based on the data available on UT-LANIC server.

To overcome this informational obstacle, UT-LANIC has been systematically researching the global communication infrastructure, gathering network information resources, and evaluating the Internet discovery tools since 1991. Since we put it on-line in 1992, UT-LANIC has become the most comprehensive and popular information system for Latin American studies, and experienced exponential growth in terms of its usage, as shown in Figure 4. In the first eight months of 1995, UT-LANIC had 1,403,034 accesses, with an average of 175,379 accesses per month.

Among this large amount of accesses, as Table 1 indicates, about 20 percent of usage are focusing on Latin America general and topical information, 60 percent on Latin American country documents and databases. Among LA country information usage, the most popular one is Mexico related services with 14.35 percent of total usage. To sum up, about 80 percent of UT-LANIC usage concentrates on Latin American country and topical information, and the rest of 20 percent of accesses not showing here in Table 1 are using our generic services such as library, publication, searchable indexes, and What's New pages.

The distribution of the telnet access to UT-LANIC is 38.18% from Latin America, 50.34% from the United States, and 11.48% from other regions, as shown in Figure 5. Among Latin American users, they are mainly from 14 countries, and the most frequent users are from Mexico, Brazil, and Venezuela as shown in Table 2.

A key indicator for measuring UT-LANIC's growth and performance is the popularity ranking in the WWW Virtual Library posted automatically everyday at the World Wide Web Consortium and CERN.⁶ UT-LANIC is always ranked ranging from top 5 to top 10 most popular academic sites among all disciplines worldwide, and the most popular site in Latin American studies.

UT-LANIC's Services and its Role in Latin American Studies

UT-LANIC provides one of the most comprehensive network information services for Latin American studies. It provides Latin American country and subject directories, Internet resource instructional and accessing tool services, and electronic publications such as on-line books, series, databases, and conference proceedings. These services are clearly visible on both UT-LANIC Gopher and WWW servers,⁷ and widely used by millions of users worldwide. Although the author is going to provide on-line presentation on some of these basic services orally at the LASA Electronic Resources for Academics panel, the scope of this section of the paper is limited to introducing and explaining three types of services: interactive posting mechanism, electronic mail interface, and searchable indexing system.

⁶ CERN is the European Laboratory for Particle Physics at Geneva, the home of the World Wide Web.

⁷ Considering the reality of Gopher vs. WWW development as shown in Figure 3, UT-LANIC has shifted its primary efforts from the Internet Gopher to the World Wide Web services, though we continue supporting both services.

Interactive Posting Mechanism

As the most popular Internet site in Latin American studies, we feel obligated to satisfy the requests from all over the world for posting their new home pages and information services on UT-LANIC. In this fast-moving virtual world, one of the best ways to announce a new service is to post it on a popular What's New page. To serve Latin Americanist community, UT-LANIC has developed a What's New⁸ page with three headings:

- What's New in World Wide Web
- What's New in Latin American Studies
- What's New in UT-LANIC

The first item points to NCSA⁹ What's New page, which a good place for finding out the new or changed sites in the Web worldwide. If you are interested in Latin America related information, however, you should check What's New in UT-LANIC regularly to keep up with the frequent updates. UT-LANIC staff constantly search new sites emerged in Latin America, systematically evaluate Latin America related services worldwide, and frequently receive requests for adding links from Latin Americanists around the world. Whenever we add new items in UT-LANIC directories, we post them on our What's New page. What's New page in UT-LANIC is accessed hundreds of times everyday, and becomes one of the most popular pages on our Web server.

To further facilitate the dissemination of Latin America related on-line information, UT-LANIC is proud to announce a new interactive service: What's New in Latin American Studies. The purpose of this service is to enable information providers and Latin Americanist scholars to announce their academic and informational pages and services on UT-LANIC automatically. To prevent abusing this facility, the automated announcing mechanism is monitored by UT-LANIC staff, like moderated bulletin board system. What's New in Latin American Studies does not currently accept submissions for non-academic personal home pages and commercial product promotions. To post a new entry, you must complete all the fields of the submitting form, as shown in Figure 6.

When a new entry is accepted, it will appear in our What's New in Latin American Studies like this:

- Virtual Library: Latin American Studies
University of Texas, Austin, TX USA
The objective of this service to provide Latin Americanists around the world with access to information on and from Latin America.

Your name and e-mail will not be visible in the final posting, but we need them to verify the link if your URL is not working, or to clarify any other issues.

⁸ <http://lanic.utexas.edu/info/new/>

⁹ NCSA stands for the National Center for Supercomputing Applications.

The nature of this interactive mechanism is to encourage serious academic announcements, which can be further processed professionally on UT-LANIC. When new entries are posted in What's New in Latin American Studies, our staff will further review them, as well as select and link the relevant items to the appropriate UT-LANIC directories. Considering the large user base as shown in the first part of this paper, the announcements posted on What's New in Latin American Studies are expected to be viewed by millions of UT-LANIC audience. This new automated and moderated posting mechanism is expected to play a key role in the diffusion of electronic resources in Latin American studies.

Electronic Mail Interface:

UT-LANIC e-mail interface is targeted at those who have no access to the Internet in Latin America, especially in the Caribbean region, Central America, and some South American countries such as Bolivia, Guyana, Paraguay and Suriname. It is also targeted at the Latin Americanists who conduct field research in these and other remote areas in Latin America.

Despite of the lack of the Internet connections, most of these areas have some sorts of networking connectivity with at least e-mail facilities. Although they are not yet able to take advantages of the interactive Internet access to UT-LANIC, through our e-mail interface they can still retrieve most information hosted in UT-LANIC server, expose themselves to more advanced networking facilities, and gain the incentive to urge their organizational and national authorities to act on the Internet connection. We plan to provide them with this low-tech solution—e-mail access to UT-LANIC until such time as they completely integrated into the Internet world in the next five to ten years.

UT-LANIC currently provides two types of e-mail interfaces: one for the Internet Gopher, and another for the World Wide Web. UT-LANIC implemented GopherMail services over a year ago.¹¹ Through our GopherMail Server, you can use e-mail to access not only UT-LANIC Gopher services, but also most Internet Gopher services worldwide. To access UT-LANIC GopherMail Service, just send an e-mail message without body text to:

`gopher@lanic.utexas.edu`

UT-LANIC GopherMail Service will automatically reply by sending you it's main gopher menu with brief instruction. Following the instruction, you may use your e-mail to access most Internet Gopher menus and files, and search WAIS and Veronica indexes. The limitation of the GopherMail Service, however, is that it does not currently support the access to the World Wide Web.

To provide e-mail access to the World Wide Web, UT-LANIC has recently implemented WWW e-mail service agora.¹² To access UT-LANIC WWW Mail Service, just send an e-mail message with the body WWW to:

`agora@lanic.utexas.edu`

UT-LANIC WWW Mail Service will automatically reply by sending you its usage instruction with examples. Following the instruction, you may use your e-mail to access

¹¹ For details on GopherMail service, see gopher://lanic.utexas.edu/00/gophermail

¹² See <http://lanic.utexas.edu/info/agora/>

not only UT-LANIC WWW Server, but also the Web worldwide. The limitation of the WWW Mail Service, however, is that it does not currently support html forms yet. By using both WWW Mail and GopherMail services in a complementary manner, you can take full advantage of our e-mail interfaces to UT-LANIC. If these e-mail interfaces are understood and used properly, they are expected to play a key role in integrating those remote areas and target users in Latin America into the Internet community.

Searchable Indexing System

UT-LANIC provides two types of searchable indexes: one for local database search, and another for international information search.¹³

Our local database searching facilities are currently implemented via full-text indexing engine Wide Area Information Server (WAIS). Through both of our Gopher and WWW gateways, you can access a variety of WAIS searchable databases hosted on UT-LANIC as follows.

- ARL Databases of Argentine and Mexican Serials
- Castro Speech Database, 1959–1994
- CLACSO Databases on its Research Institutions, Projects and Bibliographies
- CLAD Database on Public Administration
- CONAPRI Documents on Venezuela
- Electronic Book on Zapatistas
- Guide to Internet Resources for Latin American Studies by Molly E. Molloy
- LASNET Archives, 1992–1995
- USAID Latin America and the Caribbean Economic & Social Database
- UT-LANIC World Wide Web Server

To conduct efficient search of these academic databases, it is necessary to have a better understanding of UT-LANIC WAIS indexing facilities. The nature of WAIS system is the capacity of executing full-text keyword search. The result of the search is a list of documents that contain the keywords. This list of search returns is ordered by the relevancy ranking scores. These scores are automatically generated by the WAIS indexing engine according to the proportion of the keywords in the document.

UT-LANIC WAIS indexing system also supports Boolean search options including AND, OR, NOT, as well as right-hand truncation. By applying the tail truncation function, for example, the stemming query of “econom*” returns “economy”, “economics”, and “econometrics”. In another case, a search of the term “mexico” on UT-LANIC WWW Server returns 129 html documents, but a Boolean logic search of “mexico AND trade” returns 24 relevant documents. As you have just seen, WAIS searches are not case sensitive. We encourage you to try out these searching techniques to take full advantage of UT-LANIC local and international indexing system.

¹³ <http://lanic.utexas.edu/world/search/>

In addition to our local indexing of UT-LANIC hosted databases, we are proud to announce here our new international indexing service. The objective of this service is to build a global searchable indexing system for Latin American studies. This system will enable our users to conduct not only regional search of the Internet resources in Latin America, but also global search of the Latin America related information worldwide.

To achieve this objective, UT-LANIC is in the process of building both regional and global databases on the basis of our Latin American country directories and worldwide Latin American studies subject directories. We have also been evaluating the existing indexing technologies, and testing our regional indexing prototype. The heavy usage of UT-LANIC services, however, has pushed our system to the limit of its processing capacity. We are now in the process of updating our UNIX server system so as to deliver this global indexing service efficiently.

Considering the amount of efforts and factors involved, UT-LANIC plans to implement its international indexing services in three steps:

- Step 1: Index individual countries in Latin America. UT-LANIC country indexing prototype is expected to be released in November 1995.
- Step 2: Index entire Latin American region. Our Latin American regional indexing service will be released in the early 1996.
- Step 3: Index worldwide sites relevant to Latin American studies. UT-LANIC global indexing service will be released in Spring 1996.

In sum, UT-LANIC's three new services announced and explained in this paper are expected to be useful and popular. The interactive posting mechanism will enable Latin Americanists around the world to announce and register their new home pages and services on a central location—What's New in Latin American Studies on UT-LANIC, and it expects to play a key role in the dissemination of electronic resources in Latin American studies. The e-mail interface to both of our Gopher and WWW services continues to play an important role in integrating those remote areas and target users in Latin America into the Internet community. The international indexing services will make it possible for UT-LANIC users to use both sophisticated searching tools and our existing structured country and subject directories in a complementary manner, which expects to play a significant role in the discovery of the Internet resources in Latin America and in Latin American studies sites worldwide.

These recent development of UT-LANIC services and the exponential growth in term of its usage demonstrate our commitment to the informatics revolution for Latin American studies. While consistently building sophisticated high-tech systems for the future, UT-LANIC also offers useful low-tech solutions for remote areas and users. Through these user-oriented and academic-oriented efforts, UT-LANIC has not only provided one of the most comprehensive network information services in Latin American studies, but also become one of the most popular academic sites among all disciplines worldwide.

Appendix

Guidelines for Hosting Electronic Publishing on UT-LANIC¹⁴

1. Content

The content of the publication should be of a high academic quality suitable to scholars, researchers, and scientists with interests in Latin America. The publication should include information not already available electronically. Electronic publications are loaded on the UT-LANIC server and made accessible via the Internet Gopher or World-Wide Web interface.

2. Format

Publications should be sent to ILAS on diskette or CD-ROM. (Publishers who are able to transfer file via FTP should send e-mail request to publish@lanic.utexas.edu.) The preferred diskette size is 3.5" and the preferred word processing format is Microsoft Word or WordPerfect. For spreadsheet or database files, the preferred format is Excel (XLS), Lotus 123 (WKS), dBase (DBF), Character or Tab Delimited files. Hypermedia HTML documents are preferred.

3. Copyright

Copyright or permissions to the materials must be held by the respective publishers. Publishers should indicate wording for copyright attribution and any restrictions on reproducing or redistributing materials. ILAS is not responsible for the content or enforcement of copyright.

4. Updates

Publishers should indicate the frequency of publication and a schedule for sending updates to ILAS. The time schedule for updates should be appropriate to the nature of the publication (i.e., a monthly periodical would need more frequent updates than a comprehensive bibliography).

5. Space Constraints

Publishers should indicate the size of the publication in kilobytes (KB) so availability of space on the UT-LANIC server can be assessed.

6. Review

A yearly review will be made of all databases hosted on UT-LANIC to check number of accesses to each database, whether updates have been received on a regular basis, and the amount of storage space utilized by the publication. Subject to these findings, UT-LANIC

¹⁴ UT-LANIC internal document.

reserves the right to remove databases from the server. Publishers will be notified of deletions.

7. Communication

The publisher can apply for space on UT-LANIC by means of a letter briefly addressing each item from 1 through 5 above, and stating the names, addresses, telephone, fax, and e-mail address of the persons responsible for the publication, as well as the name of the academic, public or private sector organization which is associated with the publication. Applications should be sent e-mail to publish@lanic.utexas.edu, tel. 512-471-5551 (ILAS, University of Texas, Austin, Texas 78712).