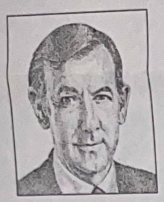
APPLIED INTELLIGENCE

The Development of ISDN Is Proceeding Worldwide



JAMES MARTIN

Part five of a six-part series on Integrated Services Digital Network (ISDN).

ISDN is developing rapidly across Europe, North America and Japan. Each country is at a different stage of development, ranging from a basic design phase to pilot and full commercial implementation. In a number of countries, ISDN is still a technology-led development. As yet, however, there isn't a universal demand for ISDN services. Therefore, the pressure to implement ISDN often comes from network operators, not users.

The way ISDN is being implemented in various parts of the world differs, invariably reflecting the regulatory environment of each country. Basically, there are three different approaches to the implementation of ISDN, categorized by developments in North America, Europe and Japan.

ISDN in North America

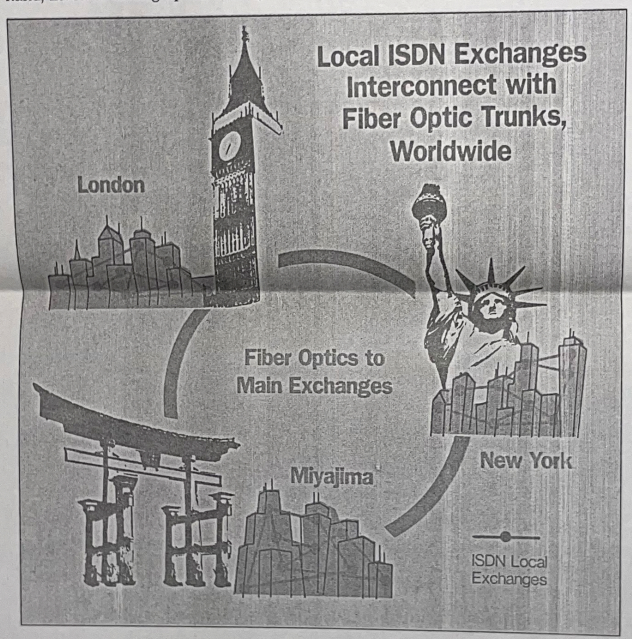
Unlike that in Europe, the telecommunications environment in North America is highly deregulated. There are many network operators, specialized carriers, long-distance carriers and value-added network operators from whom the user can choose telecommunications services. In such a situation, the development of a common standard network such as ISDN is bound to be more complex than in a state-controlled post, telegraph and telecommunications (PTT) monopoly.

Each of the major carriers and network operators (Bell Operating Companies) has announced plans to introduce ISDN-compatible networks in various stages and at different times. Unfortunately, there is no universal consistency in the level and types of services they will offer during any transitional stage. This is certain to lead to complications, especially in the area of interworking between various different networks. This aspect may be additionally complicated by the fact that ISDN interworking is one of the major areas still under study by the CCITT.

In general, most early U.S. ISDN services, as in Europe, will be geared to medium-sized to large corporate users. In many cases, this will involve the provision of ISDN Centrex services through a limited set of standard interfaces. In addition, private branch exchange (PBX) manufacturers are developing ISDN-compatible systems that can provide integrated voice and data interfaces in line with the ISDN 2B+D Basic Rate Access. The PBX would then provide the Primary Rate 23B+D interface to the network operator's local digital exchange.

Before the whole network has been upgraded to ISDN, it will be necessary for network operators to offer interim ISDN access arrangements, including the development of ISDN "islands" and the installation of an ISDN overlay network. In an island strategy, certain key network centers (normally corresponding to high-traffic urban areas) are converted to ISDN by installing ISDN-compatible switching, signalling and transmission equipment covering a specific geographic area. This allows the operator to offer limited ISDN facilities during the early stages of development, expanding these services as more islands are installed and ISDN interworking between islands is established.

The overlay approach, on the other hand, involves setting up an entirely separate ISDN network in addition to existing facilities and overlaying it onto the existing network. One of the advantages of an overlay network is that it can be installed fairly quickly and can be extended to cover a large geographical area.



Maryellen Zawatski

The way ISDN is being implemented in various parts of the world differs, invariably reflecting the regulatory environment of each country.

ISDN in Europe

In Europe, each of the various PTTs is implementing its own plans for ISDN. With the exception of the United Kingdom, all the PTTs in Europe are more or less government-controlled and do not have to compete in the provision of telecommunications services.

Throughout Europe, PTTs and network operators are undertaking major network expansion programs converting existing analog switching and transmission equipment to digital. All major European countries are installing ISDN either as pilot or commercial network services. The European Community is actively involved in promoting ISDN (and telecommunications services in general) in each of the member countries. This is being done primarily through the creation of a single Europe-wide market for telecommunications equipment and an action program for the installation of ISDN.

The aim of creating a single European market for telecommunications equipment is to establish a common set of equipment standards, thus allowing devices manufactured in one European country to be connected to a network in another. The aim of this program is not to create new standards but to harmonize the implementation of existing ones.

The most advanced ISDN broadband network of its kind in Europe has been developed by the West German Bundespost (a PTT). The Bundespost is developing ISDN services for both existing and future broadband networks. Since the mid-1980s, the Bundespost has been operating a pilot, 140M-bps fiber-optic-based broadband network. This network provides a number of business and domestic services such as CATV distribution. A full, commercial ISDN that covers all the main business and population centers is not expected to be in operation until the early 1990s.

In Japan, ISDN is evolving quite differently. Although competition is gradually being introduced into the provision of both domestic and international telecommunications services, the Japanese approach to ISDN is part of a wide, government-sponsored national technology project. This project is called the Information Network System (INS), and it encompasses a wide range of technologies and applications—from fiber optics to video and fifth-generation computers.

Among current ISDN plans and implementations, Japan's INS project is one of the most ambitious and far-reaching. The fundamental difference between INS and other ISDNs lies not in the technology but in the nature of the project itself. INS forms a major part of a government-sponsored initiative to take Japan into the "Information Age" as quickly and as coherently as possible.

Also included in the INS project are the current research activities on fifth-generation computer systems. When completed, these activities will provide a number of additional computing features within INS.

INS and Standards

The basic channel structure of INS, unlike that of the CCITT, was made up of one 64K-bps channel, one 16K-bps channel for voice or data and one 8K-bps signalling channel (64+16+8).

As INS becomes more generally available, this non-ISDN-standard channel structure is being replaced with the conventional 64+64+16 CCITT channel structure. In addition, INS integrates optical-fiber-based broadband communications into the network for a variety of video applications.

During the early 1990s, ISDN services will be available in one form or another in every major city and business center in the United States. Although most U.S. ISDN trials began somewhat later than those in Europe, all of the major Bell Operating Companies are actively involved in implementing ISDN services.

How ISDN develops in the United States will depend to a large extent on market demand. In a country that has a monopoly-controlled telecommunications network, new facilities such as ISDN tend to be led from the supply side. In a competitive network environment, the introduction of new facilities is much more demand-led.

Next week, in the final article of this series, we'll look at the information and entertainment services that will be supplied by ISDN for the home. ■

The James Martin Productivity Series, an information service updated quarterly, is available through High Productivity Software Inc., of Marblehead, Mass. (800) 242-1240. For information on seminars, please contact (in the United States and Canada) Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402 (213) 394-8305. In Europe, contact Savant, 2 New St., Carnforth, Lancs., LA5 9BX United Kingdom (0524) 734 505.