

**Proceedings of the
6th International Conference On
The Application Of Standards
For Open Systems**

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WELCOME ADDRESS

James H. Burrows
Director

National Computer Systems Laboratory
National Institute of Standards and Technology

In the decade of the 1990s we will have an exceptional opportunity to capitalize on the advances in information technology that have taken place over the past forty years. Technology changes have led to powerful desktop workstations, supercomputers, high speed communications links, and many automated applications. It is possible to decentralize computing capabilities and to distribute functions geographically throughout a business or enterprise. However, there are still limitations on our ability to communicate between processes, and to integrate the information processed by computers, word processors, industrial robots, bank terminals, and other automated activities.

This Sixth International Conference on the Application of Standards for Open Systems Interconnection comes at an important point in our planning for the information systems for the rest of this century. The cooperative efforts of users, governments and industry have taken us down the road toward open systems. Important achievements of the past decade include the development of the OSI Reference Model, the base technical standards, OSI implementation agreements, and OSI functional profiles.

We must continue to build on these achievements and to augment OSI standards and applications. We will need standards to protect the confidentiality, integrity, and availability of the information as organizations create interoperable global networks for electronic mail, business data interchange and other strategic business functions.

Another critical issue will be the development of timely and internationally recognized quality tests to ensure that vendors are not locked out of markets and that users are not locked into one vendor. The timing of

the tests is important. Cooperative programs are needed to leverage what has already been done in OSI testing to support the interoperability of hardware, software and telecommunications systems. Our goal should be to arrive at common solutions that serve both users and vendors who want to compete in an international marketplace. We need tests that are high quality, complete, easy to use, timely and internationally available. International cooperation will be essential in minimizing regional differences, reducing the need for multiple product testing cycles, and getting products to users more quickly and cheaply.

OSI standards and technology will play a critical role in our goals for global data communications networks. People with vision internationally are championing the development of fiber optic links or "information superhighways" with capabilities for transmitting gigabits per second. Such capabilities will foster the sharing of research results and data, improve communications between automated activities, and facilitate cooperative relationships among government, industry and research organizations.

While the development of new structures is always appealing, we must also give serious thought to maintaining what exists today. Resources will be needed to maintain the OSI standards, tests, and test systems, and this process will be costly. However, OSI will degrade if it is not maintained, and the work done to date to achieve open systems will be wasted.

I welcome our international visitors to the United States, and all participants to this conference. Your exchanges of information and your discussions will help us assess the progress that has been made in implementing OSI. With

understanding and cooperation, we can continue down the road to OSI and overcome the obstacles to compatible devices and systems, integrated information, and coordinated enterprise activities. OSI standards, as part of management strategies and planning, can take us toward better information systems for the 1990s and the 21st century.

New OSI Policies

Chairman:

Mr. Maclean (Australia)

OSI Strategies for Scandinavian Governments

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Abstract

Four of the Nordic countries, Sweden, Denmark, Finland and Norway have created a joint government OSI Profile, which states the requirements that the governments have in common.

Introduction

This paper is about the activities for promoting the use of open data communication, OSI, within the Nordic governments. It starts with a presentation of the Nordic countries, and cooperation between the nations. I then give a brief view of activities in each country, concentrating on Sweden. Finally, the work to produce a common Nordic OSI profile is presented.

Nordic Cooperation

Sweden, Denmark, Norway, Finland and Iceland are the Nordic countries. Inhabitants regard each other as brother nations, and there is a lot of cooperation between the nations. Agreements such as the freedom for citizens to travel and work freely within the five countries has been established for a long time. The languages, with the exception of Finnish, resemble each other, and Danish, Swedish and Norwegian are mutually understandable.

This means that a joint Nordic project on government procurement standards for Information Technology is a natural thing to do. Since the countries all are fairly small, we also believe that joint requirements will give a stronger impact. Another purpose of the project is to share experience and information.

Nordic Council of Ministers

One formal institution for the Nordic cooperation is the Nordic Council of Ministers, which reports to the Nordic Council, and has responsibility to carry out work in various sectors for Nordic cooperation. The Nordic Council of Ministers initiated the project for the Nordic Government OSI profile, and has funded the work by paying for meeting and printing costs.

Swedish SOSIP - basis for the work

In Sweden, Statskontoret, the Swedish agency for administrative development has the responsibility of procuring all computer equipment for the civil administration.

Statskontoret has promoted Opens Systems for several years. Seeing the emerging UK and US GOSIPs, Statskontoret judged the method of defining a national OSI profile as an appropriate way to go.

The work on the national OSI profile, SOSIP, started in 1988. SOSIP is based upon both UK and US GOSIP, and on functional profiles from CEN/CENELEC and NIST. It includes the applications Message Handling (X.400 - 84), FTAM, Virtual Terminal (Telnet), and Management protocol CMIP. The transport profiles are connectionless network service LANs: CSMA/CD, Token Ring, and with lower priority, Token bus. Wide area networks include X.25 and X.21, both primarily for connection-oriented network service. For interconnection between LAN and WAN, SOSIP suggests the use of CLNP IP over X.25, or the use of an interworking unit.

SOSIP includes definitions of the accepted character sets, with ISO 8859/1 as the major alternative. The Swedish version of 7-bit character code is also temporarily accepted. Profiles for ODA are also specified in SOSIP.

A function in SOSIP, that can't be found in UK or US GOSIP is the definition of X.21-based networks on layers 1 to 3, which is commonly used in Scandinavia. SOSIP also stresses the importance of using characters used in the Swedish language.

SOSIP was issued in April 1989, and has been valid for all procurement in central government since January 1st 1990.

SOSIP used in procurement.

Statskontoret's procurement activities can be involvement in the system for a particular agency. However, of increasing importance are the general contracts. Statskontoret makes a thorough evaluation, which results in contracts with a few vendors. Any agency is then allowed to buy according to these contract, without any further evaluation process. The contracts are normally valid during a two-year period. Evaluations, and general contracts have been made for Unix systems, PCs, terminals, printers and technical workstations. The next evaluation will be of networked PCs and workstations.

A general contract is an efficient tool to impose requirements for open systems. The most recent evaluation of Unix systems, and the coming one on networked workstations both included requirements from SOSIP. X.25 WAN and X.400 message handling, according to the standard of 1984 were mandatory requirements, and FTAM, OSI LANs, Virtual Terminal, ODA and CMIP were requirements that should be met within a given time-frame in 1990 - 1991. There was also a requirement that products be conformance tested before delivery. The evaluation of Unix systems for administrative use, that was completed by Statskontoret early this year, resulted in contracts with five vendors, who all met these requirements.

Norway

Norway does not have a central agency for procurement. In Norway, seven of the major governmental agencies have united in "Top Management Forum for Electronic Data Processing", to initiate a project for a national infrastructure for EDP. This project includes the establishment of standards for communication, development of new, communication based services to the public, and distribution of information. The work includes defining the Norwegian Government OSI Profile - NOSIP, which was sent out for comment in July 1990. It also includes investigation of the possible use of EDI in public service.

Finland

In Finland, work is going on, both for an OSI profile to be used within the government, and also, together with trade and industry, a national profile.

Finland stresses the use of connection-less network service, with CLNP and TP 4 as the prime alternative. The plan is to build a network of IP routers, interconnected by LANs, WANs (X.25 with CLNP) or dedicated lines.

Denmark

Denmark, being the only Nordic country in the EEC, of course contributes to, and benefits from the standardization work within the European community. The EPHOS, the European Procurement Handbook for Open Systems, will be used in Denmark, when it is completed.

Nordic Government OSI profile - joint project

The work to join the Nordic efforts on standardized data communication started in 1989. It may be noted, that the EFTA, just as the EEC, has a statement that standards shall be used for public procurement.

The basis for the joint profile was the Swedish SOSIP, at that time recently published. The Nordic profile is not identical to SOSIP. The approach has been, that requirements that are common to the four countries are included in the joint profile. Other requirements may be additional, within each national profile.

Participating organizations have been Statskontoret from Sweden, Statskonsult from Norway, the Department for administration and personnel in Denmark, and the VTKK (State Computer Service Central) in Finland. The group have met three times during one year, to discuss the common profile. Each time a suggestion of included functions has been reviewed within each country, and comments have been brought back to the next meeting. The Nordic Government OSI profile was issued in July this year. It includes application profiles, and formats:

- MHS X.400 -88 and -84
- Directory X.500
- FTAM
- Virtual terminal
- CMIP
- Edifact
- ODA

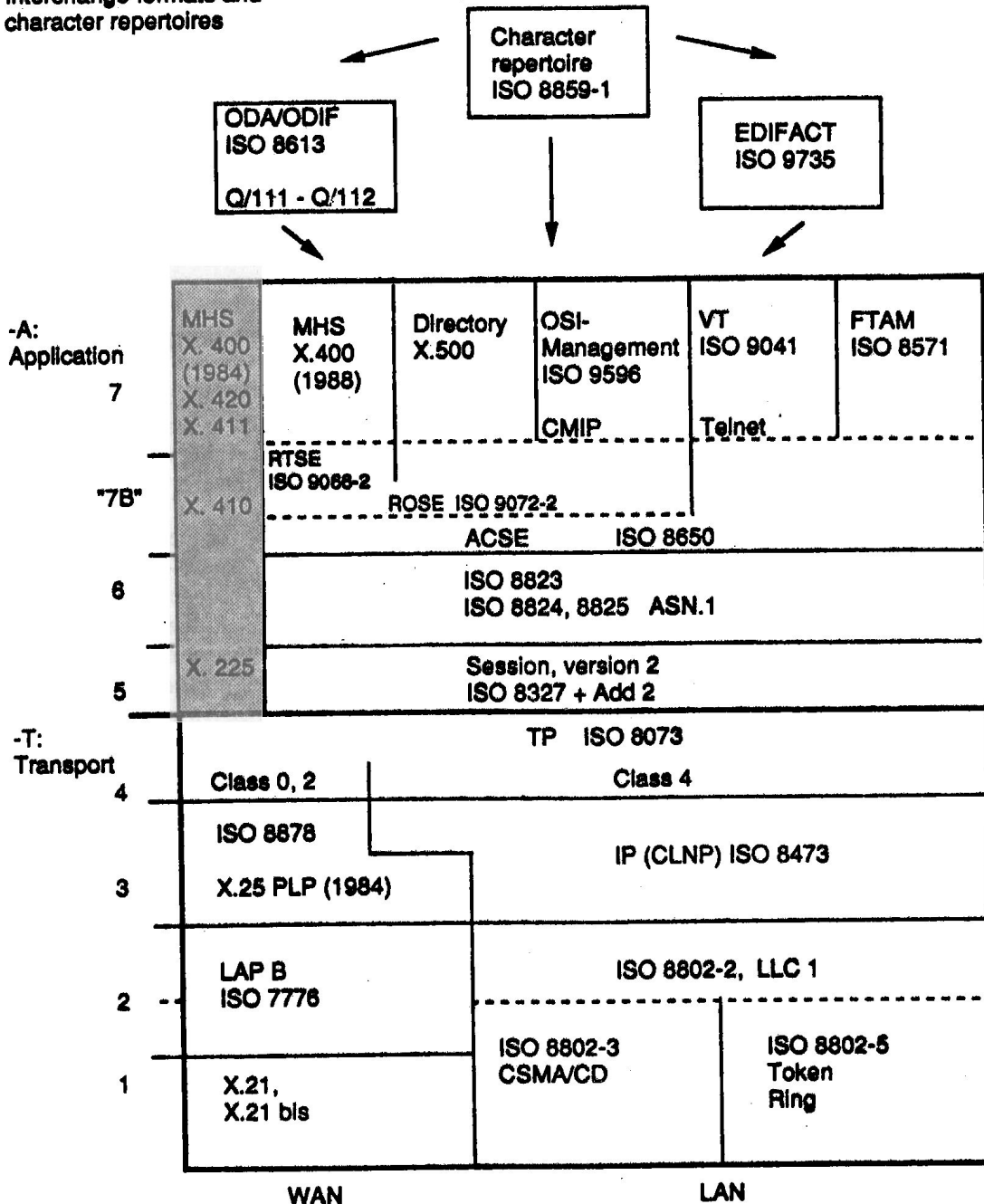
The transport profiles are the following:

- LAN, CLNS: CSMA/CD and Token Ring
- WAN X.25, either with TP0, or TP2, or with CLNP and TP4.

Although X.21 is commonly used in Scandinavia, it was not a common requirement, and is therefore not included as a part of the profile. There is however a comment that X.21 is interesting in several of the countries

It has been an eager concern to push the requirements for the 1988 version of the X.400 standard. That is the primary recommendation for MHS system. The main reason for this is the increased security functionality. However, since there are not many products available yet, it can only be a recommendation

-F:
Interchange formats and
character repertoires



The Nordic Government OSI Profile, version 1. July 1990

OSI-Related Policies in Japan

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ABSTRACT

This paper is a summary of the OSI-related policies the Japanese Government has been promoting since the last conference in Tokyo held in March 1989.

First, selected from the various reports recently released by the committees set up at the Ministry of International Trade and Industry (MITI), the Ministry of Posts and Telecommunications (MPT), Management and Coordination Agency, Japanese Industrial Standards Committee (JISC) as well as other ministries and agencies, those related to the OSI are summarized here. Next, an outline of the various policies being developed in response to these reports is presented.

1. Adopting Long-Range Visions

1.1 Special Committee on Standardization of Information Technology

In order to realize a sound information-oriented society, it is important to promote standardization of information processing equipment, software, data formats, and the like so that sufficient compatibility and interface can be maintained. But standardization in this area has not progressed as steadily as has its technology. For this and other reasons, in August 1984, the Japanese Industrial Standards Committee (JISC) established the Special Committee on Standardization of Information Technology (SCSIT), chaired by Isamu Yamashita, the former chairman of ISO and the current chairman of JISC. Since then, the SCSIT has taken the lead in examining the entire range of strategies to promote standardization programs.

The first report on the progress of standardization in the increasingly complicated and diversified field of information technology was put together in December 1984, while the second report was compiled in March 1986. Additional

investigations and discussions were undertaken on further promoting standardization, and the findings were put together on April 27, 1989 to make up the third report. In June 1989, a set of recommendations based on those findings was submitted to the Minister of International Trade and Industry.

The principal contents of the present report include positive promotion of OSI, standardization of software, and standardization of new fields of information technology.

The following are those related to the OSI:

- (1) Prompt development of basic standards and implementation specifications of transaction processing, network management, and basic security, based on preparation, and prevention of the spread of an original set of specifications and de facto standards and/or specifications of particular vendors.
- (2) Efforts to achieve international harmonization of conformance tests and clarification of the specific way in which a certification system should be set up so that it would be harmonized with the international scheme.
- (3) Establishment of an internationally unified registration system of object identifiers and a numbering system based on it.
- (4) Application of OSI to government procurement. Specifically:
 - Building a system of investigation based on cooperation among different government ministries and agencies.
 - Adopting concrete plan of introduction.
 - Diffusing OSI and OSI-related JIS to relevant government ministries and agencies.
 - Cooperating with international organization.

(5) Promotion of business protocols

- Heightening the awareness of the importance of standardizing business protocols in industry as a whole, as well as heightening the same awareness at the top management level within the industry.
- In business protocols, the data interchange has to be standardized not only within the same industry but also between different industries. Thus a system of deliberations and examinations involving all industries and users will be reinforced, and medium- and long-term programs will be developed to effectively apply the system.
- It is important to establish the syntax rules and specific standard message on invoice or purchase order will be developed. Code systematization, its application management, and a registration system will be established.
- Guidelines on Joint Utilization of Computers, adopted in 1986 to promote information-oriented technology in each industry, are expected to play an extremely effective role. Hence in the future, concrete measures will be taken to promote standardization through adoption of effective guidelines.

1.2 Special Committee on Long-Range Planning for the Promotion of Industrial Standardization

It was some 40 years ago, in 1949, that the Industrial Standardization Law came into force in Japan. One is compelled to recognize anew the enormous impact and contributions to the Japanese economy that the law has made during this period. At the same time, it was a occasion to focus our attention on the change of recent years that are now affecting the way in which industrial standardization is supporting the foundations of industry.

The industrial standardization program is today being carried out in tandem with the Sixth Long-Range Plan for the Promotion of Industrial Standardization, which runs for a five-year period ending in March 1991. But in order to effectively respond, among other things, to the rapidly changing international environment and the manifestation of new needs accompanying the structural changes taking place in Japanese society, and the various demands being made on the JIS Marking system, in March 1990, the Japanese Industrial Standards Committee established, under its Standards Council, the Special Committee on Long-Range Planning for the Promotion of Industrial Standardization. In this committee, the basic policy for administering the JIS system in the future was discussed and scrutinized repeatedly, and the results were put together and submitted to the Minister of International Trade and Industry in June this year.

The report thus submitted to the MITI minister contains the following descriptions related to information technology centering on OSI:

(1) Promotion of forward-looking, flexible and speedy standardization. In the field of information processing and FA, it is important to ensure, among other things, interoperability and compatibility. To achieve this, the critical task is to decide how to implement an anticipatory standardization systems timely and effectively. In the areas where there is rapid progress, it is necessary to be flexible in implementing standardization measures rather than being unduly particular about their formats. For example, even if only partially, standardization measures should first be implemented, and then additional measures or revisions should be introduced as the need rises. In the area of information technology in particular, administration of the standardization system that takes this point into consideration is desirable.

(2) With regard to standardization of information technology, in addition to having manufacturers double their efforts to increase user convenience, it is necessary to take bold steps such as to introduce an English text into JIS and simplify the procedures for revising standards.

Moreover, in addition to establishing standards, it is essential to strengthen measures aimed at the introduction and promotion of OSI and electronic data interchange (EDI) for major users such as government agencies and financial organizations

Furthermore, in this area, it is particularly important to ensure consistency with international standards, and more essential than ever to independently engage in activities related to making positive proposals and international joint operations at an early stage in the process of adopting international standards, not to mention ensuring consistency between JIS and international standards.

1.3 Information Processing Interoperation Environment Development Committee

The time is ripe for globally promoting OSI, but before the migration towards OSI system can be made, there are a number of problems that should be solved in promoting interoperability of information processing, such as registration and management of object identifiers needed for OSI and development of standard business protocol necessary for EDI.

Thus, in order to ensure effective interoperability between different computers, MITI's Machinery and Information Industries Bureau established the Information Processing Interoperation Environment Development Committee in August 1989. The committee aims to focus on specific problems and consider methods for solving them.

The following four subcommittees were set up under the said committee:

(1) Subcommittee for OSI Promotion

Supplying of OSI products went into full swing last year, and the time is becoming ripe for the introduction and use of OSI products by user companies. But as things stand now, these products have been introduced in only a small number of advanced users.

This lackluster performance is attributed mostly to the fact that at this point the level of standardization and product development desired by users has not yet been achieved. It is also attributed to the fact that users are uneasy about, among other things, suppliers' production plans, methods of implementing them, and the future direction of OSI.

At this subcommittee, researchers are examining ways to connect different computers, the cherished desire of all users, while filling the gap in information, recognition and the like that exists between suppliers and users. They are also examining ways to quickly promote multivender systems.

(2) Subcommittee for Registration Authority and Administration

The object registration authority will assign an identifier to each object and make public that object if an application for object registration is submitted. Since it is impractical for a single registration authority (International Registration Authority) to register and make public every object in the world, the ISO member-body of each country is assigned to register all its domestic objects.

In this subcommittee, the duties that should be performed by the Japanese registration authority are being investigated. The objects that should be registered and made public by the said authority and the identifiers assigned to them, as well as the registration application of objects and the method of inspection are also being examined in this subcommittee.

For a detail discussion, see 3.1.

(3) Subcommittee for Conformance Testing, Accreditation and Certification

This subcommittee undertakes investigations on the various testing and certification systems currently operating in Japan. The results are used as reference in considering the possibility of establishing systems in Japan which are capable of granting and receiving approvals from testing and certification systems throughout the world.

For further discussion, refer to Professor Asano's presentation given on the third day.

(4) Subcommittee for EDI

This subcommittee investigates the actual state of EDI and the EDI trend in various foreign countries. The results are used to examine, among other things, the tasks related to EDI standards and their systematization, as well as tasks related to improving the environment for promoting the introduction of EDI.

1.4 Telecommunications Technology Council

'The Long-Term Plans for the Standardization of Telecommunication Systems' was drawn up by the Telecommunications Technology Council of the Ministry of Posts and Telecommunications in 1988.

In the future, as a result of the increased sophistication of advanced information society, the diversification of social needs, the rapid pace of technological innovations, and the like, we can expect greater sophistication and diversification in digitals, such as the trend toward digitization, digital networks, multimedia and intelligent designs. As we strive to achieve smooth and orderly development of such telecommunication systems, the role of standardization is becoming more important than ever.

Thus various measures will have to be devised to ensure smoother and more effective promotion of Japan's future telecommunications activities with the following viewpoints being taken into consideration:

(1) The need to deal appropriately with the remarkable expansion of the range of standardization targets and the enormous increase and complication of the work involved.

(2) The need to clarify the roles to be shared by the government and the agencies concerned so that standardization activities, which are expected to increase in the future, can be undertaken more smoothly and effectively, as well as to indicate the direction of those activities.

(3) The need to take into account frictions and international cooperation in the technological field accompanying the internationalization of telecommunications.

(4) The need to deal appropriately with intellectual property right and other issues centering on standardization.

(5) The need to reexamine the ITU structure and, on the basis of the trends in the Interregional Telecommunications Standards Conference, to deal appropriately with the rapidly changing demand for international standardization.

Thus we are examining the overall long- and medium-term standardization vision by setting up a 'Standardization Policy Committee' in the Telecommunications Technology Council. The promotion of OSI is one of the key items of investigation in this section. A concrete standardization vision and a promotional policy will be devised in time for 1991.

1.5 Policy of the Management and Coordination Agency

In December 1989, following Cabinet resolution was adopted concerning the issue of promoting introduction of OSI in the government:

Development and improvement of information system in the government should be promoted referring to the international standards on OSI (Open Systems Interconnection), in close cooperation with ministries and agencies concerned. In addition, concrete measures should be prepared in order to promote implementation of OSI in the government.

The Management and Coordination Agency is responsible for comprehensively coordinating efforts at promoting information systems in the government. To fulfill this responsibility, the agency will actively promote the introduction of OSI as a basis for establishing information networks among various ministries and agencies. The agency is undertaking the following measures by convening meetings of persons in charge of the information system from each ministry and agency:

- Preparation of a guidebook for promoting introduction of OSI which contains information on methods of introducing OSI, procedures for its application, and points to keep in mind;
- Registration and management of a unified organizational code in object identifiers for government organizations;
- Examination of what government procurement standards should be like.

2. Standardization

2.1 Establishment of JIS

At the Japanese Industrial Standards Committee, the work of establishing OSI-related standards as Japanese industrial standards (JIS) is being continued energetically, just as before. Since March last year, among other items, the following have been added to JIS: LAN Logical Link Control, CSMA/CD, Token Rings, ISDN connector, ASN. 1, Basic encoding rules for ASN. 1, Naming and Addressing. The characteristic feature of ASN. 1 is that it has been expanded to permit the use of the Japanese language for ISO 8824. The structure of object identifiers, Network layer addressing, the Directory and others are soon to be included in JIS.

Moreover, the work of making distributed transaction processing (TP) standards as JIS, the demand for which has been especially strong among big users, has been in progress since the start of the current fiscal year. Up to now, conversion JIS standards had involved translating complete English texts into Japanese, which often caused delays when the original English sentences contained some ambiguity.

But the TP introduced here is aimed at timely translation of international standards into JIS. Toward this end, the TP is expected to involve translation of only those parts which are absolutely necessary; the original English text are to be used for the rest.

2.2 Development of Implementation Specifications

Implementation specifications are being developed at INTAP under international cooperation. By April last year, a total of 14 handbooks were published as JIS Annex (separate volumes), including FTAM, MOTIS, ODA, and the Directory.

From the current fiscal year and onwards, based on the progress in standardization and the demands of society, INTAP plans to continue developing implementation specifications, among other things, transaction processing and network management. After the confirmation of their interoperability experiments, these specifications will then be made public one after another. Those specifications corresponding to ISP regulations will also be made public periodically.

2.3 Establishing Standards in Private-Sector

In the field of telecommunications, the market was opened to the private sector, thus ensuring a fair, competitive market and heightening the awareness of the need for independent adoption of standards so as to maintain trust among carriers, manufacturers and users. This is why the Telecommunications Technology Committee was established in 1985 as an organization for adopting private-sector standards regarding telecommunications.

This corporation is run with the participation of people in Japan as well as in the United States, Europe etc. involved in telecommunications. In addition to establishing large numbers of standards based on OSI, the Committee strives to spread those standards that it has developed.

2.4 User Participation in Standardization

In the past, the views of the supplier side tended to be reflected more strongly in matters related to standardization. However, particularly in the area of application of standardization, it is essential that the views of the user side be fully taken into consideration. For this reason, the selection of standardization targets and the development of their applications are being carried out on the basis of the views expressed at, for example, the ISDN User's Forum for the Development of New Technology.

3. Improvement in Interoperability and Inter-Telecommunication capabilities

3.1 Establishment of an Object Identifier Registration System

Based on the results of discussions held at the subcommittee for Registration Authority and Administration of 1.3(2), JISC will establish JIS that specifies the rules of registering object identifiers under the ISO root in Japan on November 1, 1990.

According to this standard, under the member-body structure, the objects will be lined up flat under the node of JISC identified by "392."

These object identifiers are divided into a number of areas according to their numbers. In other words, they are divided into several categories, for example, "standard objects used in Japan", or "organizations". In the category of "organizations", the object identifiers are further divided into "government organizations", "local government organizations", and "other organizations".

The proposal to make the classification system under the CCITT root the same as the above is being considered at the Ministry of Posts and Telecommunications. As far as the user is concerned, whether the identifier is (iso member-body "392") or (ccitt administration "440") in the upper hierarchy, codes of lower hierarchy can be treated similarly.

3.2 Conformance Test and Interoperability Test

With regard to the conformance test for OSI, the INTAP Conformance Test Center (ICTC) began its conformance testing service in March 1989. When a product passes in the conformance test, ICTC issues an INTAP certificate attesting of conformance. As of the end of June 1990, six of the systems in the transport layer (classes 0, 2) passed, and all six systems are waiting for the application review. Nine of the FTAM systems passed, seven are pending review. Three of the MOTIS systems passed, seven are now pending review.

Moreover, the INTAPnet was set up to provide an en-viroment where a connection between different type computers would always be possible. The network is now in full operation, and an interoperability test, to be conducted inside the network, is now being considered.

Japan is participating in OSI^{ONE}, among other things, to promote the demonstration of international connection, and is endeavoring to cooperate with members of the OSInet and the EuroSInet.

Meanwhile, with regard to an organization for testing MAP, in October 1989, the MAP Testing Center (MTC) was set up within the technical research institute affiliated with the Japan Society for the Promotion of Machine Industry, and the MAP conformance testing service began in March 1990. The testing systems were introduced from Europe and the United States.

In anticipation of a full-scale diffusion of OSI, it is an urgent task to provide a domestic system regarding accreditation of conformance testing laboratories and methods and certification of test results, as well as to realize an international mutual recognition system.

3.3 Promotion Conference of Harmonization for Advanced Telecommunication Systems (HATS Conference)

The Promotion Conference of Harmonization for Advanced Telecommunication Systems (HATS Conference), which was established for the promotion of harmonization for advanced communication systems developed on the basis of the OSI, is now engaging in various activities with the participation of telecommunication business operators, manufacturers, and users. Interconnection tests -- including those for G-4 facsimiles based on the ODA/ODIF/DTAM system, MHS, and PBX etc. -- have been conducted. In the future, interconnection tests will be conducted for personal computer communications based on OSI, LAN etc.

