A View from the International Organization for Standardization (ISO)*

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The paper describes the role of the Internation Organization for Standardization (ISO) and its interaction with the other key international standards bodies (IEC, CCITT,...), the development of telecommunications standards for Open Systems Interconnection (OSI), Local Area Networks (LANs) and Integrated Services Digital Networks (ISDNs).

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Mr. Rankine joined IBM in 1956 and subsequently held several positions associated with the public utilities industries. He became the Data Processing Division's utilities industry manager in 1963, and two years later was promoted to manager of IBM's sales and marketing operations for the six New England states. He was promoted to director of data communications in 1967. In October 1968, he was promoted to his present position.

Mr. Rankine is a member of the board of directors of the American national Standards Institute and the Information Industry Association. In 1980, he was awarded the Astin-Polk International Standards Medal for distinguished service in promoting trade and understanding among nations. He participates in the standards activities of the International Electrotechnical Commission and the International Standards Organization in Geneva. He is currently chairman of the parent committee on Information Processing Systems of the International Standards Organization. He is also appointed by the U.S. Business Council to represent U.S. business interests in certain committees and commissions of the Organization for Economic Cooperation and Development (OECD) and the International Chamber of Commerce. He holds memberships in the Institute of Electrical and Electronic Engineers, the American Association for the Advancement of Science, and the Institution of Electrical Engineers (United Kingdom).

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Ladies and Gentlemen,

First I should like to congratulate all of those who have worked so hard to organize and stage this very important Conference with the timely theme of "New Communication Services – A Chalenge to Computer Technology." I must confess, However, a slight prejudice in my personal point of view. Being from the computer industry, had I been one of the organizers, I would have been tempted to make the theme "Computer Technology – the New Opportunity for Communications Services."

Whichever way you write the theme makes no difference to the fact that international standards are absolutely vital in successfully meeting the challenges being addressed in this Conference. The standards must be developed fairly and openly, they must be interpreted uniformly, and the verification of performance to them must be based on internationally accepted methods applied on a nondiscriminatory basis available to all. If any of these criteria are not met, then the tremendous benefits that lie before us all will not be achieved and users everywhere will be denied that which they want and need to do.

Properly utilized, the international standards organizations are the best way to achieve the standards we all need. I say organizations in the plural because there are others beyond ISO, notably the International Electrotechnik Commission (IEC) and the International Telegraph and Telephone Consultative Committee (CCITT). The three organizations bring together the interests of users, governments, communications providers and manufacturers. It is within this triangle of organizations, all within a few metres of each other in Rue Varembe in Geneva, that we have the ability to produce those standards that will provide the most benefits for the greatest number of users worldwide. Coming into being just after the World War II, iso brings together the standards bodies of 90 member nations and a wide field of standards ranging from tractors to freight containers. The technical work of iso is carried out by some 2,400

technical bodies (164 technical committees, 646 subcommittees and 1,585 working groups and study groups), to date, ISO has published 6,172 international standards. In 1985, ISO published 600 international standards and 685 draft standards were submitted for voting, 430 international organizations have been granted liaison with the ISO. In the field of information technology, ISO has been the source of international standards for programming languages, data transmission codes, keyboards, storage media such as tapes and magnetic disks, credit cards, interfaces, Open Systems Interconnection (OSI), Local Area Networks (LANs) and some aspects of Integrated Services Digital Networks (ISDNs).

On the same floor of the same building in Rue Varembe, IEC brings together the national committees of some 44 countries on matters such as high voltage transmission, switchgear, power generation, electrical cabling, safety, electromagnetic interference, LANs, etc.

Across the street from ISO and IEC, the CCITT is engaged in recommendations for all kinds of telecommunications standards especially those for OSI and ISDNs.

Immediately you can see that there is the need for careful coordination among all of those activities, otherwise, there would be duplication of effort and unnecessary waste of highly expert and extremely scarce technical talent. Seeing this, the Presidents and Councils of the IEC and ISO established a small and balanced group of individuals to decide any areas of dispute which could not otherwise be resolved as to whether work should be done in ISO or IEC.

This group is the Joint Technical Programming Committee (JTPC). Specifically for the area of information technology, the JTPC appointed the Information Technology Management Group (ILMG) directing it also to maintain all necessary liaison with the CCITT, the European Computer Manufacturers Association (ECMA) and other organizations having interests. The Director General of the CCITT, Mr. Theo Irmer, is a most valuable member of the ITMG and as a result, there is good and necessary cooperation among ISO, IEC, CCITT, ECMA and others in achieving the standards so vital to the purpose of this Conference.

A relatively new factor increasing the need for cooperation is that certain users and implementers of standards are starting collectively to develop limited selections of options from ISO, CCITT and IEC standards that will themselves establish de fact international standards. These activities are also drawing on scarce technical resources and to a certain degree challenging the position of ISO and IEC. This is not to argue against the need for such activities but to recognize that they broaden the need for cooperation, otherwise there will be considerable confusion in the minds of users as to who is responsible for what with a concomitant slowing down of the entire process. I believe both ISO and IEC are increasingly aware of this and steps will be taken to ensure cooperation with these new organizations.

Perhaps it is now timely for me to give you a brief report on the standards activities that are most germane to the interests of this Conference namely, OSI, ISDNs and LANs.

OSI standards are needed by users and manufacturers to provide communications capabilities among networks of different architectures. Accordingly, the manufacturers are very much involved with the OSI standardization process in ISO. An ISO standard for the 7-layer OSI reference model already exists and for the most part standards have been completed up through layer 5 with standards such as $\times 0.25$ already applicable to layers 1 through 3. A number of standards for layers 6 and 7 will be completed during the next 12 months.

In regard to LANs, IEEE and ECMA standards encompassing token ring, token bus, and CSMA/CD already exist and are in the final balloting stages in ISO.

From what I have said, you may be getting the impression that already a lot of different architectures are arising. The fact is that they are. The reason is that users and manufacturers often make early and useful implementations of new and advanced technologies before standardization has had time to take place. This is not bad, because often the most useful standards turn out to be those that document successful and proven user experience.

A fact of life, therefore, is that there exists today a variety of communications network architectures provided by different manufacturers which users will want to continue to use because they are particularly suited to their needs. This must be taken into account in the OSI standardization

process because, if it is not, then it will not be possible for users to make full use of OSI and its economic benefits to both users and network providers will be limited.

But now let us focus on ISDNs and their standardization requirements. In addition to the high degree of cooperation needed, there will have to be a very careful allocation of the work to be done between the CCITT and the ISO.

So far, most of what has been done on ISDN in the CCITT applies, as one might expect, to the first three layers of the ISO reference model, namely, those covering the physical interface and the user network signaling protocols. For example, the physical definition of the connector has been allocated to ISO and the electrical signaling properties of the interface with the network is with the CCITT.

One thing is clear at this stage and that is that digital interfaces are the wave of the future and we can expect that they will replace existing analog interfaces with few exceptions. The current CCITT ISDN interface recommendations based on a 4-wire approach can handle a telephone and a terminal. The key question is can it handle all of the needs of the users?

But there are other factors completely divorced from the standardization process itself that will affect the ISDN standards needed. Examples are regulatory decisions, the degree to which users can define needs, and also let us face it, political decisions which based on past experience in areas such as television have tended to split the world into regions.

At all costs, we must avoid country-by-country and even region-by region implementations in ISDNs, otherwise there will be needless differences, expenses, and problems for users. The need is for truly international standards developed by the qualified international standards bodies.

Even although the workload being imposed on ISO, IEC, CCITT and the other international standards organizations is enormous, I am confident the system can produce the necessary standards, testing and verification procedures needed. That is provided we all use the system properly and do not abuse it.

Those involved in ISO recognize that the "new communications services" which are the central theme of your conference are going to be of major significance in all fields of human endeavor – Finance, government, education, manufacturing, employment, media, entertainment, transportation, business and personal communications, health care, working at home, law, insurance, and information services of all kinds affecting national and individual prosperity and well-being.

In effect, communications services are going to affect our future and quality of life as nations and individuals in ways that we cannot even envisage at this stage. Therefore, the foundations on which these services are built must be capable of withstanding time and structure that we cannot fully dimension at this stage. What we do know, however, is that the structure must be based on truly international standards that reflect the needs of all interests, ISO is proud to be associated with you in your pursuit of the goals of this conference.