TRANSBORDER DATA FLOW

Concerns in Privacy Protection and Free Flow of Information

Steady growth in the volume of transborder data flows and continuing imbalances in the directions of these flows are adding fuel to the transborder data flow (TDF) debate. The importance and potential effects of outflows of data to be processed abroad in foreign computer systems as well as inflows of information products have increased to the point where countries are beginning to create policies for regulating TDF in order to avert various perceived negative economic, political, societal and cultural effects. A recent report on telecommunications and Canadian sovereignty[1] illustrates this vividly. Regarding TDF, the report recommended that the Canadian government "act immediately to regulate transborder data flows to ensure that we do not lose control of information vital to the maintenance of national sovereignty."

This report also noted that the value of computing services imported into Canada in 1978 was in the $300 million to $350 million range and that by 1985 this value is expected to increase to $1.5 billion. By that time, it is estimated that some 23,000 jobs in the data processing industry will be lost to Canadians because of DP performed in the U.S.

On the other side of the Atlantic, the Nora-Minc report to the president of France[2] recommended that France use "the power of the decree" to gain greater self-sufficiency and reduce its dependence on foreign DP.

Similar concerns have been expressed by other countries that are principal users of foreign DP services and/or are major locations for subsidiaries of foreign multinational corporations. From a combined economic and political perspective, the question is raised as to who really controls exported data and the processing performed on it. Nominally, owners of the data have the management and retrieval rights, but control over the processing facilities — and hence also the data located in them — rests with the service suppliers and the governments where the processing facilities are located. Many countries are asking themselves whether control by foreign entities over such increasingly vital services and data impinges on their national sovereignty.

Third World Concerns

Similar concerns arise in importation of technical information and "media products" as, again, flows are imbalanced. Only a few developed countries, led by the U.S., are the major exporters to other industrialized countries and to the less industrialized Third World countries. Figure 1 (on In Depth/2) illustrates the nature of Third World TDF concerns.

Transfer of technical information has become a rapidly growing and important international phenomenon. Massive amounts of technical knowledge are transferred between countries through foreign aid programs, military assistance, foreign student exchange and cooperative scientific research programs; by way of commercial and governmental data base and information retrieval services; and as an adjunct of sales of "high-technology" products (such as for training and operation-oriented education).

International trade in "media products" (television programming, newspapers, magazines, films and news services) has increased in step with the rise of world literacy and the associated increase in mass media availability and affordability. Media products from foreign countries are filling the airwaves and newsstands of less developed countries. They compete on the economic level with fledgling local media products industries and on the political level with governments (which often control the local media). In the process, they introduce cultural values

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The American Federation of Information Processing Societies (Afips) Panel on Transborder Data Flow was established in January 1978 to respond to requests for comments on position papers and proposals developed by federal agencies dealing with the TDF problem.

The problem to be addresed was the growing international controversy over the possibility that, in several countries, governmental restrictions might be placed on transfers of data for processing and storage in foreign computer systems.

By the end of 1978, the panel had produced several short working papers. The panel subsequently decided to produce a more comprehensive study of the problems and issues involved. The report from which this chapter is drawn is the product of that effort.

The two-volume report was published by the Washington office of Afips at Suite 805, 1815 North Lynn St., Arlington, Va. 22209. The report was edited by the panel chairman, Dr. Rein Turn of California State University, Northridge, Calif.

afips Panel on Transborder Data Flow
Dr. Rein Turn, Chairman

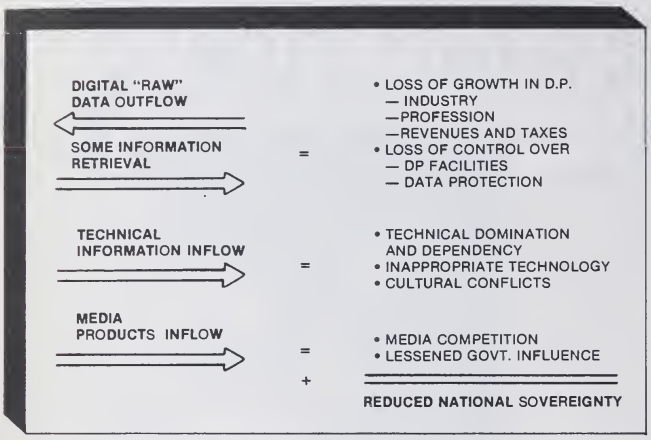

Figure 1. Perspective of Informatics Dependents

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and perspectives that frequently conflict with those traditionally held in the importing country.

Importation of technical information, information products and DP services is increasing because this is easier and less costly than developing local capabilities. However, the result may be increased technical and economic dependence. Foreign technology is also likely to be imbued with a cultural bias that reflects the exporting country's cultural, social, economic and intellectual traditions and institutions. Its adoption can create societal and cultural conflicts that may result in serious disruptions in the cultural and social order of the importing country.

Information Industries

A basic concern in countries that currently depend heavily on foreign DP services is that the development of domestic information processing industries is weakened by the loss of processing business to foreign vendors. Governments of these countries are likely to favor TDF restrictions. On the other hand, countries that predominantly import data for processing (that is, provide DP services in other countries) are seeking to maintain unrestricted transborder data flows to maintain their advantageous position.

Some countries may pursue both restrictive and permissive TDF policies at the same time, since they are effectively data-importing countries and data-exporting countries at the same time. For example, a European country may be the dominant partner in DP trade relationships with certain Third World countries and thus favor the status quo in TDF, but may also be a dominated partner in a DP trade relationship with the U.S. and thus favor a change.

Imbalanced data flows have already caused some data-exporting countries, particularly in the Third World, to adopt policies to restrain data outflows and to favor domestic or cooperatively developed regional DP telecommunications or media products industries. Even some European countries that already have well-developed domestic DP industries are considering cooperative regional developments (for example, through the European Economic Community) and are coordinating the related legal and regulatory policies, such as data protection in the Council of Europe and telecommunications tariffs in the Conference Europeene des Administrations des Postes et des Telecommunications (Cept) in Brussels, Belgium.

The trend in foreign countries toward government-directed development of DP and information industries and promulgation of related regulatory policies is contrasted by the U.S. approach. Policy formulation in the U.S. is pluralistic and market-driven — determined decentrally and competitively. The following quote from a statement by Henry Geller, Assistant Secretary of Commerce for Communications and Information and administrator of the National Telecommunications and Information Administration (NTIA), expresses the principles traditional in the U.S.:[3] "Reliance on competitive and the private sector whenever feasible, rather than on government regulation or intervention; rational cost-based telecommunications tariff and rate structures which are based on publicly available data and which seek to avoid subsidies or, where they [subsidies] are deemed to be in the public interest, to make them explicit." Figure 2 illustrates the communications policy aspects of the TDF debate.

Status Quo Threatened

It is apparent from this brief look at international information policy issues that the status quo in transborder data flows is seriously threatened. U.S. information policies and traditions are challenged by legislative actions in data protection in several European countries, actual or proposed changes in telecommunications tariffs in many First World countries and regulations and restrictions on foreign-based industries operating in the Third World. In addition, proposals are pending throughout the world to levy new duties or taxes on transborder data flows, imported data processing equipment and DP services from abroad.

Within the described general context, the international debate on TDF policies has emerged from a complex interaction of several policy areas. Several approaches can be taken for their presentation and analysis. In this article, international data transfer and information policy arenas are grouped into two categories: (1) those arising primarily from conflicts among First World countries (presently the U.S. vs. virtually the rest of the industrial-

TRANSBORDER DATA FLOW

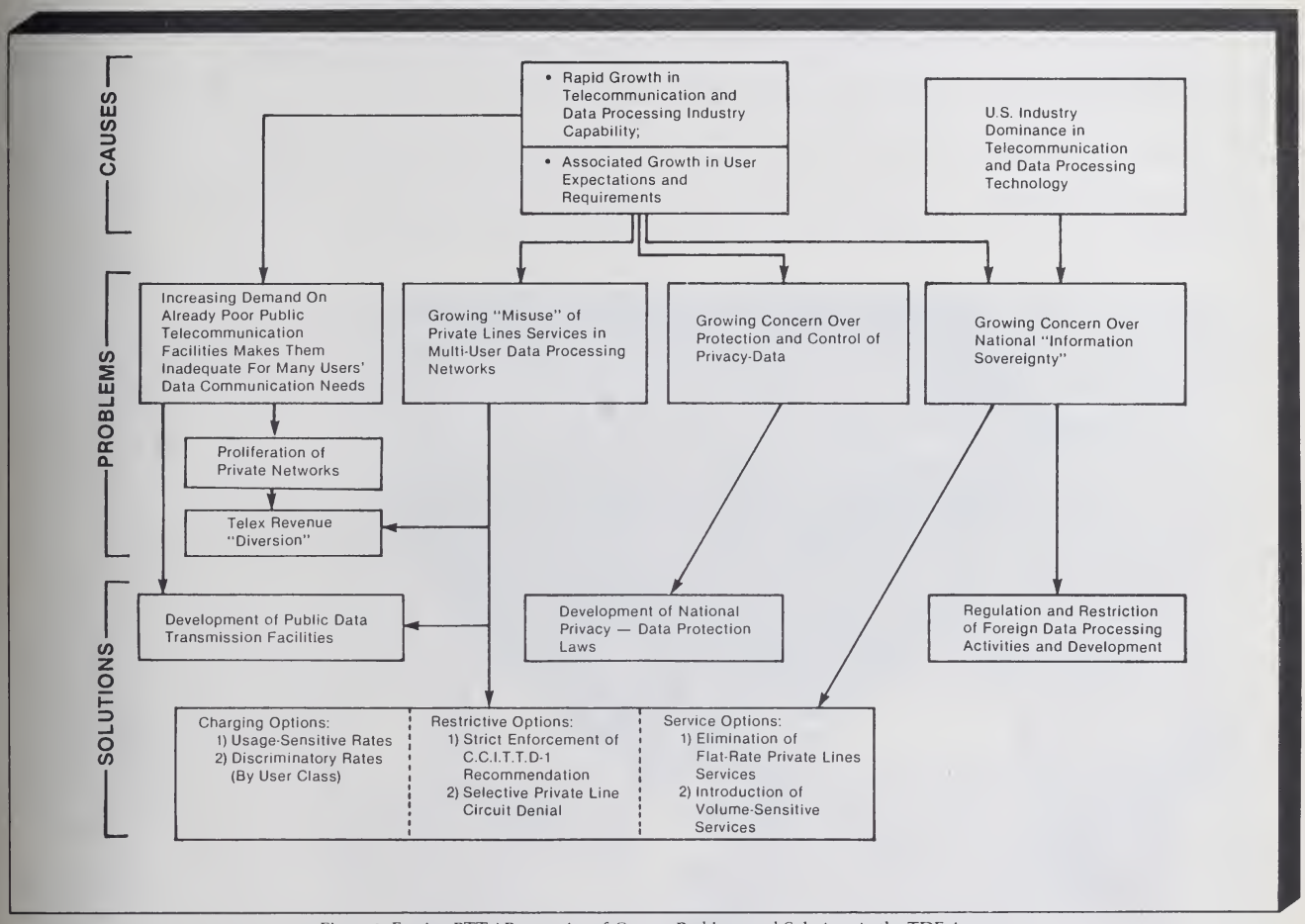

Figure 2. Foreign PTTs' Perspective of Causes, Problems and Solutions in the TDF Area

ized world) and (2) those arising primarily from conflicts between industrial countries of the First World and those of the developing countries of the Third World. (The First World and Third World categorizations are used here because of their common use in international studies, discussions and analyses; no other meanings are intended.)

Data protection policy, telecommunications policy and DP economics are the key areas in the TDF debate among most of the highly industrialized First World countries. Figure 3 illustrates these relationships.

Privacy Protection Policy

Since the early 1970s, an increasing number of privacy protection laws and regulations have been enacted in industrial countries to control the collection, use, dissemination and transmission aboard of personal data about individuals. The focus is on personal data that is maintained in DP systems. Privacy protection laws are motivated by concerns that arose in the 1960s over erosion of individual privacy and other rights as a result of growing automation of personal records. These concerns are still valid and they include the following:

1. Automation of record-keeping systems is on the increase, as is their use in making decisions about individuals and their potential impacts on the modern society.
2. DP systems and data in them are subject to misuse, and they are vulnerable to various threats.
3. Much of the personal data collected may lack relevance to the purposes for which it is to be used, and its quality (including accuracy, completeness and currency) may be unacceptably low.

A recent public opinion poll in the U.S. [4] showed that these concerns are increasing. For example, more than 64% of the respondents felt that automated record-keeping operations pose a threat to personal privacy, and more than 50% were concerned about the use of personal information about them by the government and private business.

Responding to these concerns, the U.S., Canada and several European countries have enacted privacy protection/data protection legislation. In this context, privacy protection refers to a set of rights that individuals can claim under law vis-a-vis the collection, storage, processing, use and dissemination of personal data about themselves in record-keeping systems; data protection has a somewhat broader scope.

Because of differing perceptions of the problems and differing political and legal systems and traditions, existing privacy protection laws tend to ex-

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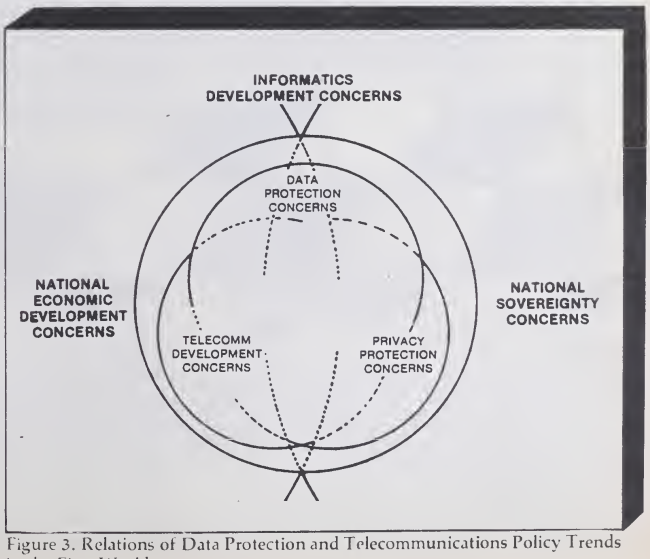

Figure 3. Relations of Data Protection and Telecommunications Policy Trends in the First World

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hibit considerable variations concerning:

1. **Scope of applicability:** the public sector only or both the public and private sectors.
2. **Types of data subjects covered:** natural persons only or natural as well as legal persons.
3. **Types of record-keeping systems covered:** automated or both automated and manual systems.
4. **Types of data categories given special confidentiality or privileged status** (political preference, racial, religious, medical and so forth).
5. **Type of enforcement mechanism** (such as regulatory commissions or enforcement through court action).
6. **TDF restrictions:** explicit or implicit; whether comparable protection in receiving country is required.

Such variations have caused considerable concern among organizations facing obligations under these laws, such as multinational corporations, international DP services vendors and other businesses engaged in international trade. The problem of having to interpret, implement and comply with data protection laws and associated requirements in the various "home countries" is compounded when transborder transfers of protected data take place. (In this article, "home country" designates the country of an individual whose privacy is to be protected by a data protection law; "host country" designates the country in which an information processing system is located which processes foreign data.)

For example, which country's laws apply when processing and storage functions are distributed throughout several countries? If the privacy protection laws in a host country do not protect certain classes of data, will contractual protection be acceptable to the data protection authorities of the home country?

Problems for U.S. Firms

The last question is of particular importance to those organizations that may wish to process or store protected data in the U.S. To date, the European approach to data protection has been to create "omnibus" data protection laws that apply broadly to all organizations in the public and private sectors. In contrast, the U.S. has adopted a "sectoral" approach in which custom-tailored privacy protection and fair information practices laws are targeted at particular parts of the public or private sectors (such as health, consumer credit, insurance or criminal justice).

Because the latter process is relatively slow and since gaps in protection still exist, rigidly applied TDF restrictions in European data protection laws can prohibit certain data transfers to the U.S. This prospect has led to strong protestations by U.S. -based DP enterprises as well as by multinational corporations in the U.S. that TDF restrictions are not necessary for protecting personal data but instead serve an ulterior objective to reduce U.S. competition in the European DP market[5,6].

Whatever the true reasons for proposed TDF restrictions, privacy protection continues to remain an explicit focus for data protection activities in most of the First World countries. The undesirability of significant differences in these laws is recognized by these countries, and harmonization efforts are progressing in several international fora. Thus, the Council of Europe (COE) has drafted a Convention for the Protection of Individuals with Regard to Automatic Processing of Personal Data, which will have the force of law for signatory countries, but membership will be voluntary. Twenty-one European countries are eligible; others will be invited.

The Organization for Economic Cooperation and Development (OECD), on the other hand, having a less homogeneous group of members (Canada, the U.S., Japan, Australia and New Zealand are the principal non-European members), a number of which have yet to develop privacy legislation, favors a set of voluntary guidelines on privacy protection.

Both of these projects, the COE Draft Convention and the OECD guidelines, are similar in the principles of privacy protection espoused. The guidelines are broader in scope, however, in that they are not restricted to covering automated record-keeping systems only, as is the COE Draft Convention. Both documents acknowledge a need for continued free flow of information

and emphasize the need to avoid unjustified nontariff barriers "in the way of economic, commercial, cultural and scientific links between peoples."

On the other hand, both documents permit countries to adopt measures that provide additional protection to the data subjects. For example, they may extend coverage to legal persons (corporations and other entities which are persons in the eyes of the law) as well as to physical persons, as has been done in the data protection laws enacted in Norway, Austria and Luxembourg.

These prospects worry some U.S. business organizations engaged in international trade. They tend to see protectionist policies as the true rationale for data protection laws in Europe. Their concerns were heightened by recent proposals in Canada and in Europe for extending data protection to cover such politically or economically sensitive data as information about natural resource reserves and development plans, government operations and budgets, planning and operations of goverment-owned or -supported industries and data about unemployment.

Indeed, it seems quite reasonable to assume that, as their domestic information industries' capabilities increase government will restrict storage and processing of sensitive data to their own territories, to be performed by domestic DP organizations. From this point of view, the concerns in the U.S. appear to be well-justified.

Telecommunications Policies

The second group of policy issues affecting the TDF debate concerns the development, diversity, sophistication, permissible uses, pricing and control of telecommunications services used in international computer communications systems and remote computing service networks. Generally, in all countries except the U.S. and Canada, the national government provides and controls telecommunications facilities and services through its postal, telephone and telegraph administration (PTT). By and large, PTTs are responsible for generating their own revenues (mainly from telecommunications, which often must also subsidize the postal services). Thus, they are intensely concerned about maintaining and, whenever possible, expanding revenues from telecommunications services.

Since the 1960s, the vast proliferation of private leased-line networks has alarmed most of the PTTs. Since they were unable or unwilling to develop adequate public data communications services, the PTTs leased private lines to national and international enterprises wishing to build their own private data communications networks. By paying flat monthly rates for lines, interconnecting them with private switching equipment and developing sophisticated "value-added" features, the private data networks established a more reliable, flexibly controlled and cost-effective service than the public switched telephone network (PSTN) and Telex alternatives.

As the private networks grew, provided added services and carried more traffic, the PTTs began to perceive problems:

- A potential loss of revenues from the two most profitable public services, Telex and PSTN, as a result of the diversion of traffic onto the more economical private networks.
- Lack of control over multiple-user networks which may permit, or cannot easily control, direct terminal-to-terminal communications or message switching in violation of leased-line tariffs and international agreements of the Consultative Committee for International Telephone and Telegraph (CCITT).
- Difficulties in telecommunications facilities planning.

The latter is a highly problematic, esoteric and inexact discipline even under the best of circumstances and is greatly complicated by the existence of private networks (with private plans, time schedules and so on.)

In order to reduce such problems and regain control of the data communications marketplace in their countries, some PTTs appear to have evolved a two-part strategy. One part involves the development of public data communications networks that could offer services similar to those of private data networks, but which would charge for services on a data volume basis, thus

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Willfried Muller, VAX System Manager
Institute of Nuclear Medicine
German Cancer Research Center
Heidelberg, Germany

The Institute for Nuclear Medicine at the German Cancer Research Center uses gamma cameras, ultrasonic scanners and X-ray computer tomography for the detection of tumors. These processed medical images are also used as input data for surgery and radiation therapy treatment planning.

For these applications, the Institute needed a powerful computer.

Willfried Muller, VAX System Manager, tells why they decided on Digital's VAX-11/780: "We needed a machine that would not only process images quickly, but also help us develop new programs for our applications. In both areas, VAX seemed to be ideal."

VAX's accessibility was also critical: "Our user community includes many different types of people. The fact that VAX is interactive and easy to use is very important to us.

"Also," Muller continues, "our image processing work made VAX's large program capacity very attractive. It can hold several big matrixes simultaneously. Equally important, VAX can be expanded to meet our requirements for years to come."

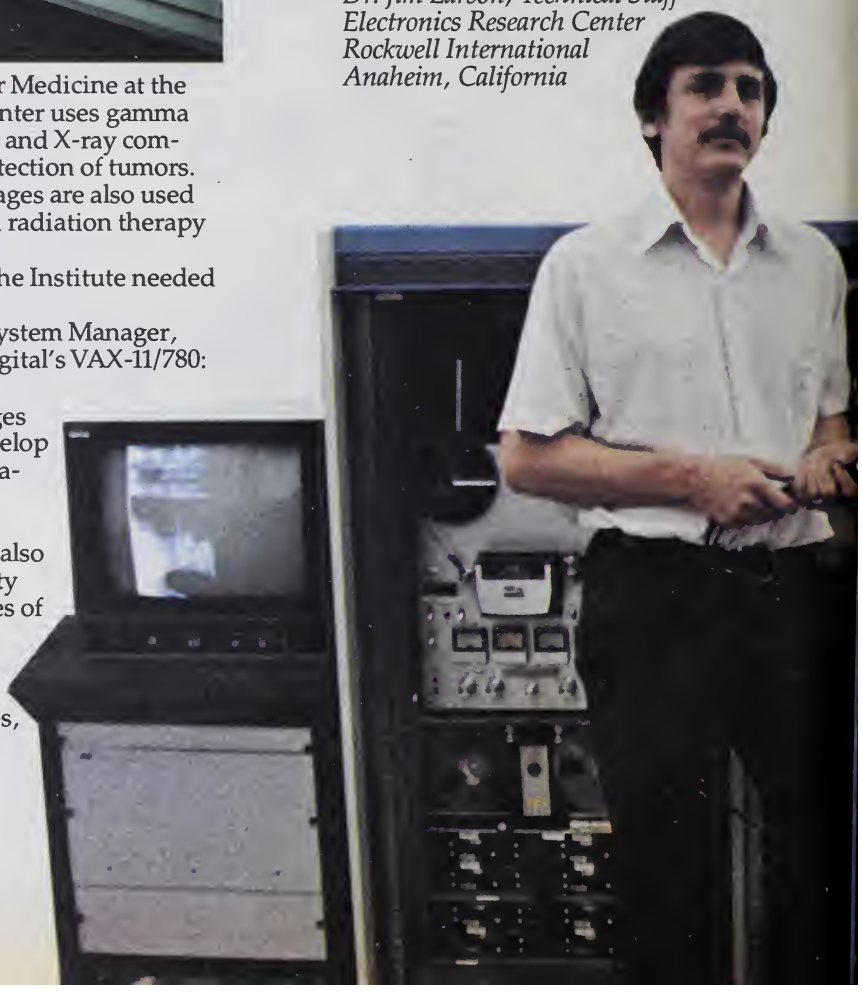
On ease of program conversion, Muller says, "We're finding it as simple as Digital promised."

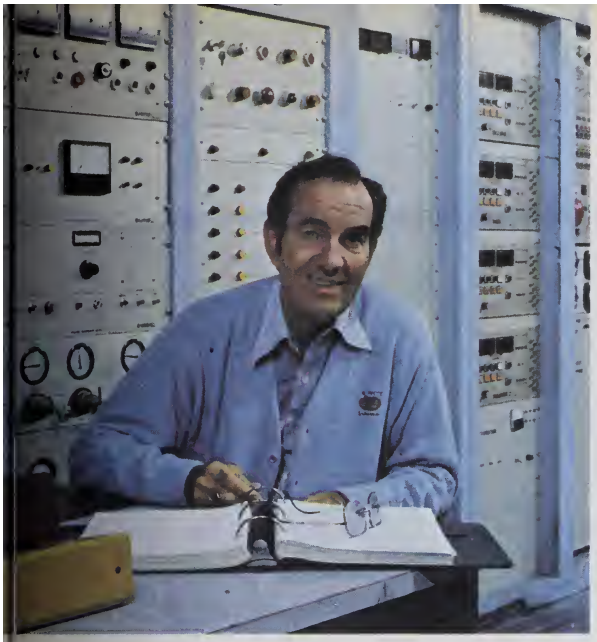
And according to Muller, VAX's price/performance ratio has proved "very favorable."

Concludes Muller, "We don't know of another machine anywhere that could handle the job as well as VAX."

"VAX's real-time capabilities are even better than we expected."

Dr. Jim Larson, Technical Staff
Electronics Research Center
Rockwell International
Anaheim, California





Scientists at the Information Sciences Laboratory at Rockwell International Electronics Research Center are developing computer applications such as target-spotting identification and tracking, image enhancement, and speech processing.

For such state-of-the-art research they needed a state-of-the-art computer. They chose Digital's VAX-11/780

According to Dr. Jim Larson, member of the technical staff at Rockwell International, "VAX gives us great real-time response. With our old mainframe computer, we had to suspend all of our other user processes during real-time digitization. But VAX's FORTRAN is a lot more powerful. On VAX you never even know when something is being digitized.

The fact that VAX is able to handle real-time and interactive analysis simultaneously is a feature that's especially attractive. Says Larson, "Our people only have to learn and use one computer."

"VAX's large address capacity makes it a powerful real-time machine."

Dr. William E. Drummond, Chairman
Austin Research Associates
Austin, Texas

At Austin Research Associates in Austin, Texas, plasma physicists are using VAX to conduct far-ranging scientific research on the collective acceleration of sub-atomic particles.

"We chose VAX because it provided the ability to directly address very large data arrays. And that is crucial to each of our applications," explains Dr. Drummond, Chairman at Austin Research.

"VAX has the capacity to acquire data simultaneously from 15 different experimental sensors, digitize it, and immediately present results to our researchers. And furthermore, "Drummond adds, "VAX gives us a perspective we never had before by rapidly providing data comparisons with thousands of earlier test results.

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eliminating the present economies of the flat-rate, leased-line tariffs.

This may increase international data communications costs as much as ten-fold. However, it is uncertain whether the PTTs can really match the ability of private networks to incorporate state-of-the-art technical advances, to maintain reliability and security and to provide adequate service and support.

The second part of the strategy, concurrent with the development of public networks, is to alter conventional flat-rate leased-line tariffs by selective introduction of usage-sensitive tariffs for some multiple-user customers. This change is also to the disadvantage of private network operators, even though the considerable increases in flat-rate charges in recent years are reducing the difference.

Volume-sensitive tariffs for low-and medium-speed international services have already been established, and some PTTs are pressuring private multiple-user data networks to use these instead of flat-rate, leased-line services.

The PTTs appear to be determined to force users of private networks onto the public data networks using economic means or restrictive regulations. In terms of transborder data flow concerns, the outcome is likely to be greatly increased cost of, and greatly reduced user control over, international data transfers.

Numerous international issues in data flows between industrialized countries and the Third World seem now to be coalescing and giving rise to policy trends of great significance to the TDF debate. These issues form the framework of a much larger international controversy concerning the nature and degree of political, economic, technological and cultural interdependence between nations. A major part of the controversy concerns whether (and how) to reduce the great dependence of Third World countries on the First World for DP services and information products.

In developing countries, there is a growing concern over the still embryonic state of DP industries and the consequent heavy dependence on the First World. Similar dependence on other types of information products (television programming, periodicals, news services); commercial products that follow (consumer goods); and the associated cultural "products" (ideas, values, styles) is of equal concern. Most of these countries regard an economic, technological and cultural inundation from abroad as a very real threat to national sovereignty.

The question is, to what degree can they reduce the present overdependence on the First World, and how can they direct or encourage development of the types of information industries that can help achieve the political, economic and cultural goals of their societies? A growing number of Third World nations have sought to develop means to effectuate their preferred policies in these areas. These means are labeled "informatics/economic policies" in this article.

Generally, national informatics/-economic policies involve the planning and control of domestic information industries or institutions. More specifically, included are policies on infrastructure development, educational and professional programs, product and service development and usage, foreign product service and system usage and international information flows. Even though the particular national policies chosen within each country vary according to political traditions, the goals of the government and the nature of the problems perceived, they usually address many of the same types of concerns.

Intergovernmental Conference

On the international policy level, many Third World countries are members of the Intergovernmental Bureau for Informatics (IBI). In August 1978, IBI and the United Nation's Educational, Scientific and Cultural Organization (Unesco) cosponsored an Intergovernmental Conference on Strategy and Policies in Informatics (Spin); another conference on the topic of transborder data flows is planned for 1980. The resolutions adopted at the Spin conference continue the development of what has become known as the "New World Information Order" — an effort by Third World countries to implement their goals of lessened dependence in informatics on the First

World countries.

The following excerpts from the Spin resolutions[7] illustrate the direction taken in formulating cooperative informatics/economic policies among the Third World countries:

1. Governments should make efforts to exchange experiences and information acquired (in informatics) in ascertaining their needs and in meeting them.

2. Governments should encourage a more rational use of local informatics capability in hardware, software and services, and bilateral agreements between countries should be encouraged for the sharing of techniques, resources and information regarding (informatics) education and training.

3. Every effort should be made to promote abolition of discriminatory restrictions in exchange of scientific and technical documentation and the sale of computer hardware and software.

4. International agreements should be established on the rights of states in respect to transborder data flows, providing for the protection of information held by governments, private institutions and individuals.

Many Third World countries perceive that as the more industrially developed countries evolve into the "information age" (in which information industry trade will become predominant), the Third World will lag behind and suffer continuing domination (as it did in the early industrial era). In an attempt to break this cycle, these countries strive to develop and protect their own information industries/institutions and at the same time minimize the impact of and reliance on First World information industries.

Converging Trends

One important matter of disagreement in the TDF debate concerns the motivations alleged to the various parties and the interrelationships between their actions in the three policy areas. Some observers have asserted that tariff policies and data protection legislation in Europe stem from the common objective to blunt the impact of U.S. technological and economic superiority in computer communications.

While the consequences of these policies may be the same, the individual motivations behind them have arisen for quite different reasons. The financially strapped PTTs may indeed espouse this goal as they have continually sought new sources of revenue and have been genuinely alarmed that private networks may divert revenue from public services. As for privacy protection concerns, they emerged in the national and international scene in the early 1960s as a result of large-scale automation of record-keeping and were extended to TDF in response to increased transborder flows of personal data.

However, it is becoming more apparent that while the earlier motivations in the two policy areas may have arisen for unrelated reasons, future motivations will probably arise from a more common and integrated set of concerns. This is not to say that earlier motivations of the PTTs and data protection advocates will have disappeared, but rather that they will have become integral parts of the broader concerns.

The integrated set of concerns that seems to be evolving in most European countries and in Canada parallels the informatics/economic concerns of the Third World (the difference being one of degree rather than type). Governments of these countries are taking note of the fact that the ability to access, process, use and control vital information is a requisite for the maintenance of political, cultural and economic sovereignty. Concerns of data protection advocates for the protection of personal data are a subset of this, as are the concerns of PTTs for greater revenue from telecommunications services.

Observers have noted three policy trends: development of European data protection policies; continuing increases in PTT-controlled data communications costs; and growth of Third World informatics/economic policies. When contrasting these three trends to U.S. policies, observers have found outlines of a significant conflict — even described as an "informatics war"[8] — that is beginning to emerge.

Indeed, many Third World countries have openly stated their goal of thwarting First World (often read,

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U.S.) information processing dominance in their countries. Comments from the 1978 Spin conference in Torremolinos, Spain, attest to the seriousness with which many Third World representatives view the problem [8]:

- Information is more than a form of power. It is an entire power system itself: it allows countries and people to make use of other techniques.
- Informatics is critical for development; there is a real possibility of a redistribution of world power zones because of monopolizing of world wide information networks.
- There is a growing inequality within the industrialized world: one or two countries (or even a single multinational corporation) against all other countries which would be reduced to mere intermediaries or peripheral agents — their independence would disintegrate.

Will First World countries also subscribe to these beliefs and adopt the philosophies of Third World informatics advocates? At present it appears that they probably will as illustrated by recommendations in France [2] and in Canada [1]. However because the interdependencies are greater and because information industry disparities are smaller among First World nations (as compared to differences between the First and Third Worlds), the policies toward independence in informatics developed by First World countries are likely to be less severe, in terms of regulations and restrictions imposed on transborder data flows, than those that are likely to emerge in Third World countries.

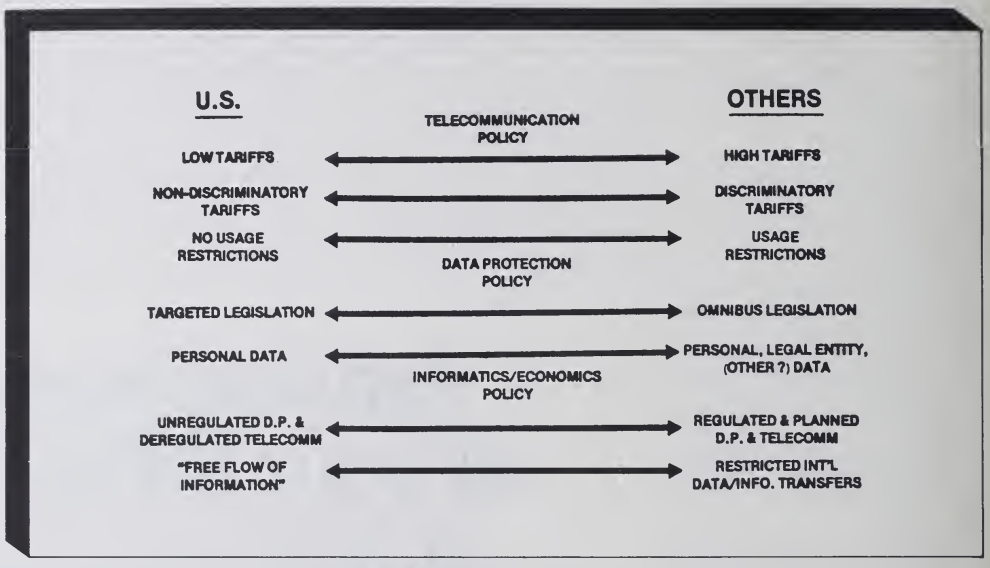

Figure 4. Summary — U.S. vs. Others

Altered Economic Reality

Nonetheless, the U.S. is likely to be faced with an altered international economic reality. With controls on international information flows increasing, no longer will U.S. international enterprises (both information processing industries and other industries or enterprises) be able to continue the growth of their international operation and expansion in the same way they have to date. Figure 4 illustrates the areas of contention.

These issues and the changes that will stem from them do not represent a temporary aberration in international relations; rather, they represent the beginning of a significant alteration in the present interational economic order for informatics now dominated by First World countries, the U.S. in particular.

Over the next few years, a number of international conferences will take place in which decisions vital to U.S. information industry interests will be made. The following are a few examples of planned international meetings and the issues that will be addressed:

- The United Nations conference on the Peaceful Uses of Outer Space will address issues related to satellite remote sensing of natural resources and the rights of surveyed nations vis-a-vis the surveyors.
- A UN committee will convene to address whether broadcasters of one nation may have to acquire advance clearance from another nation before sending programs there via satellite.
- A UN conference on Science and Technology for Development will have addressed the relation between science and technology applications and the world economic order.

Whether or not the U.S. can effectively participate in the efforts to examine and restructure the basic economic relationships between countries, relationships will change. Broadly speaking, U.S. policymakers face two sets of decisions regarding U.S. participation in this restructuring effort:

1. They must decide what degree of centralization and unification of approach would be most advantageous in dealing with such issues. Is the present decentralized structure of informatics-related government agencies appropriate, or would a centrally coordinated policymaking structure be better for international negotiations?
2. They must decide on the degree of cooperation to be extended in each forum and on each issue.

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