Setting standards

Letting 100 flowers bloom

Imagine that every state in the US had railway lines of different width. A train from one state could never cross into another. At every point where a railway line crossed a state border there would be a transshipment depot for taking cargo from trains of one state and reloading it onto the trains of the next state. Clearly, in this world transport would be slow and costly, and the growth of transport-dependent business would be retarded.

In this example, the problem is lack of standardization. Railroads have not agreed to a standard width, and consequently cannot do business together readily. Failure to agree on standards is causing less visible but equally important and costly problems to the international operations area. Without universal standards, data must go through the electronic equivalent of a transshipment depot every time it leaves one firm.

Double jeopardy

There are two types of standard at issue—technical standards defined by the computer and communications industries, and commercial standards and formats defined by the securities and commercial banking industries. Historically, the first major vendor in a field often attempts to set a standard, as with IBM and PC DOS and SNA. Now, increasingly, standards are being set by industrywide and often international committees. The CCITT is one such body, operating at the level of technical communications matters. The Group of Thirty is another, operating at the level of business practices.

Examples of lack of technical standardization are the competing MNP and CCITT approaches to error correction and data compression, the SNA and X.25 data network architectures, and the inability of one database to read a file from another.

Commercial standards operate at a higher level and typically refer to formats for storing and transferring data, or conventions for identifying objects. Examples of lack of standards here are ISIN [see "Numbering the world," page 65], CUSIP and SEDOL securities numbering systems, SWIFT, DTCIID, and ABA instruction formats, and many others. In computer-to-computer communications, where each machine stores or identifies data in different ways, you need format converters, which take data in one format or numbering system and convert it to another. These are the electronic equivalents of the transshipment depots in the railway example. And they have corresponding costs, delays, and errors.

There is no simple solution to the problem of lack of universal standards, except to press professional bodies to choose them wisely and promulgate them actively. A difficulty is that, with several competing standards (ISIN versus SEDOL, for example), a bet must be made about which will ultimately dominate. SWIFT is working on establishing formats for securities-related messages, and it seems likely that SWIFT's standards will ultimately become the industry standards. They are in general well chosen, and are also neutral in the sense of not reflecting any one market's conventions or prejudices.

> *Failure to agree on standards is causing costly problems to the international operations area. Without them data must go through the electronic equivalent of a transshipment depot every time it leaves one firm.*

But using SWIFT formats in communication, and using SWIFT's network to communicate, are two quite different decisions. SWIFT's formats and standards, which are of course public domain and available for use by anyone, may become more widely used than its network. It could make sense to use them with clients, even if the clients are not SWIFT members. In some ways it is unfortunate that SWIFT combines the roles of setting standards and providing a commercial service: these tasks are often better divorced.

The standard setter

In communications, the standard setter is the CCITT, the Geneva-based group which set the CCITT V.24 and V.42bis standards for modems. CCITT defined the X.25 and X.400 protocols (standards) for machine-to-machine communication. CCITT sets standards only for machine-to-machine links, the so-called low-level links. Standardization at the level of software products such as databases, accounting systems, and spreadsheets, which would enable one firm's database to update another's accounting system, is still only a concept. Several major computer makers, including IBM, have teamed together to form the Open Software Foundation, which is attempting to develop a Distributed Computing Environment (DCE) that will set standards for the interchangeability of data between minicomputers and workstations running UNIX-based applications. Part of the development work relating to securities industry standards is being done at Columbia university.

Most agree that it makes sense to use SWIFT message formats and CCITT communications standards wherever possible. Unfortunately, they leave a lot uncovered. The best insurance against picking the wrong standards where no universal standard has emerged is flexibility. Users should build in the ability to adapt and alter formats that are not covered by SWIFT. Good modern databases make this easy to do. The software industry is now increasingly aware of the need for "open systems," which means systems that can easily talk to other systems.

action. Double check, try to prevent known problems, follow through on your checklist of problem areas. This "intelligent communications task" is by nature one in which record-keeping and information must be shared with others, in which databases must be simultaneously updated on several continents, and in which it really pays to process trades simultaneously in New York, London, and Tokyo. Indeed, the more decentralized your information is, the more efficient your experts will be. Your Tokyo office will perform better if it has immediate access to the same information as your New York office. Mini-supercomputers—small, fast, inexpensive, and flexible—are made to order for these parallel tasks.

Yet any decentralized system is only as efficient as its communications channels. Supermodems multiply many times the speed of communication between existing processors via existing networks. This is accomplished through data compression and error correction, as well as through

Continued on page 142

Speed merchants

High-speed networks come of age

Nothing will lower the costs and raise the potential of communications as much as the effective integration of fiber-optics into long-distance networks. Currently, most long-distance communications signals are sent as electrical impulses down copper wire.

In a fiber-optic network, the signal travels as a pulse of light along a thin glass fiber. As Einstein taught the world, nothing goes faster than light—186,000 miles per second. At that rate, it takes only eight minutes to get from the sun to the earth. The data throughput that can be achieved with fibreoptics borders on the incredible: for example, with a fiber-optic link the entire *Encyclopedia Britannica* can be sent from London to Tokyo in two seconds.

With such extraordinary performance available, network capacity will be superabundant. Equally striking, glass fiber is cheaper than copper. So the expectation is that widespread use of fiber will lead to almost unlimited low-cost high-speed communications. Everything that is now done with communications will be done at a fraction of the current cost and in a fraction of the current time.

More important will be the new possibilities opened up. Clearly there will be an enormous boost to distributed and decentralized processing architectures: it will be cheap and easy to send information to anyone (agent, client, trader), anywhere, for them to work on it themselves. Processing on networks of small machines communicating with each other will replace centralized processing on large machines. It will become realistic to maintain separate but fully synchronized databases in London, New York, and Tokyo.

Equivalent decreases are occurring in the cost of desktop computing. The amount of computer power bought per dollar spent on workstations roughly doubles every 18 months. IBM recently announced decreases of up to 60% in the prices of its workstations.

> *Large centralized global custody systems will become things of the past: the global custodian will become more of an electronic post office and sorting office.*

With immense data handling power on each desk, and instantaneous and inexpensive communications links, there will be little advantage to centralized processing. A global custodian will no longer produce reports for its clients on its mainframe and download them to the clients. Clients will have powerful database systems on their desks, and the custodian will just send all data relating to a client to that database, and leave the client to analyze it in whatever way is convenient.

Large centralized global custody systems will become things of the past: the global custodian will become more of an electronic post office and sorting office, routing data to and from agents and clients after making basic consistency checks against positions. The cost differential between global and domestic custody will decrease, and custodians will be looking for new services to maintain their margins.

These cheap, ultra-fast communications and cheap, super-powerful desktop computers are changing totally the preferred architecture for global custody computer and communications systems. Some foresee that the global custodian will do less for clients: it will pass entire data sets on to them and leave them to do their own analysis in-house. Here less is more, for although the custodian will do less work, the client equipped with its own workstation and database will get more value from the data then it previously got from the custodian's reports.

So global custodians need to improve client interfaces, encourage decentralization to client desktops, and focus on where they can really add value. Probably this is in arcane areas like tax reclamation, in managing and monitoring subcustodians, and in providing banking and trading services in an integrated package.

Continued from page 93

higher basic data transmission speeds. SWIFT messages are transmitted in a universal payments language; but some are asking whether the SWIFT network is as speedy, efficient, and cost-effective as that offered by mini-supercomputers, and whether SWIFT will be superfluous when high-speed networks become available. Here, one must distinguish between the two communications services offered by SWIFT. One is a universal language, the so-called "standardization" that is so valuable when parties wish to understand each other's messages without translating them. The second is the actual message delivery. Yet SWIFT's networks are by no means the state-of-the-art when speedy communications are called for. Even as SWIFT 2 is made to run on Northern Telecom's X.25 network, fiber-optic networks are stealing the show. Fact is, in five to ten years time—approximately the time it took to bring SWIFT 2 to life—virtual networks running on fiber-optic cables will outstrip by a large margin the speed and delivery capacity of today's X.25 networks—at the same time undercutting the cost.

Installation costs remain the principal reason for using SWIFT. Interfaces are in place already. Most correspondent banks use SWIFT, as do most broker clients. New installations take time.

As more subcustodians install automated systems and more markets conform to the Group of Thirty's recommendations, clearance and custody may become more of a buyer's market. At that point, it will be possible to private-label a specialized network management facility without buying expensive network services from an established bank. Inexpensive high-speed networks will enable specialized vendors to offer "turnkey" global custody networks at a fraction of today's prices, and even give them an information provision capability that today's global custody services lack.

For instance, few custodians today can give a client access to the same type of portfolio information on a client's own terminal that a custodian has. Fewer still can give clients corporate action reports and the ability to query them on-line. A client which wants portfolio reports in all currencies, updated for market changes throughout the day for all countries in which it trades, is bound to be disappointed. Likewise the client which wants the ability to analyze this data historically over a two- to three-year timespan, or who wants to monitor its position in each geographical area or in each stock sector will be frustrated. There will be no joy either for clients wanting immediate reports of all settlements in all the relevant currencies and of all open positions, or for clients wanting to analyze their portfolio of bonds versus equities for risk.

Clearly, clients would switch to a service that offered such capabilities. Nor need it cost that much. Indeed, the new technologies of mini-supercomputers and high-speed networks will make this simple and easily affordable if the overall technology architecture adopted by the global custodian is right. The key is getting it all straight, doing it in a coordinated fashion, meshing properly in-house accounting and analysis systems with decentralized processing in all offices and with all clients and subcustodians. Brokers must get the technologies right as well. "The analysis of international synthetic asset-based securities and multi-currency trading must be updated on a par with domestic techniques," says Goldman Sach's David Mann.

The technology layers of such a decentralized system are straightforward [see "Layering technology"]. The key issue is that, while accounting and analysis systems may live physically at a client's site, communications and subcustodian management systems may live at the site of a vendor who can utilize increasing returns by servicing many users at once and charging rock-bottom prices. This way, one of the largest costs of the global custody industry today—the spare capacity of global custody systems that can run up to 50% to 60% even at busy custodians—can be eliminated.

Global custody is now 500% more expensive than domestic custody, and it does not offer the reporting services that clients need to manage complex portfolios successfully. This yawning gap between costs and services cannot last. The new technologies will ensure that the future forces the present into compliance.

Global custody is now 500% more expensive than domestic custody, and it does not offer the reporting services that clients need to manage complex portfolios successfully. This yawning gap between costs and services cannot last. The new technologies will ensure that the future forces the present into compliance.