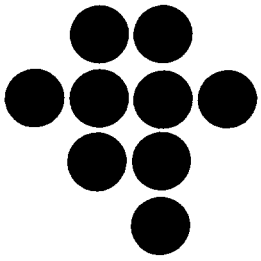

COMMUNICATIONS
FORUM

INTERORGANIZATIONAL SYSTEMS: PUBLIC OR PRIVATE?

October 2, 1986

Seminar Notes

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

COMMUNICATIONS FORUM

INTERORGANIZATIONAL SYSTEMS: PUBLIC OR PRIVATE?

October 2, 1986

Seminar Notes

Michael Marcus
M.I.T.
on leave from the FCC

Carl E. Code
General Motors Corporation

Benn R. Konsynski
Harvard Business School

INTERORGANIZATIONAL SYSTEMS (IOS): PUBLIC OR PRIVATE?

Benn R. Konsynski - Harvard Business School

INTRODUCTION

Konsynski began by asserting that interorganizational systems (IOS), electronic links between independent organizations for the purpose of conducting a sale, collecting information or coordinating joint activities, between previously independent organizations, is a growing and largely uncontrolled phenomenon. IOS are the result of organizations that have perceived efficiencies in control over transactions that extend beyond their organizational boundaries. Konsynski suggested that there may be a need for organizational (internally derived to protect organizational integrity) as well as national (socially determined to reflect values and culture) policies to control the growth and use of IOS. According to Konsynski, IOS are more than points of ingress and egress for information. Rather they are purveyors of cross organizational policies, and in this context, could be perceived as either an opportunity or a threat. Therefore it is necessary to make sure the right people make IOS policy decisions. Konsynski noted that IOS involve the following activities which are negotiated between participating organizations:

- Formal interchange
- Standardized format
- Consolidation of channels
- Distribution of subtasks (i.e. re-apportioning tasks across corporate boundaries)

IOS TECHNOLOGY

Interconnect technologies ranging from specialized

electronic "umbilicals" to public or private information highways, enable IOS. It is necessary to decide whether policies are required to govern and/or monitor this technology. Konsynski listed the following connection options:

- Stand alone interconnect (electronic links)
- Gateways and filters (protocol convertors)
- IOS managed isolated networks
- IOS controlled logical subnets on the public network
- Integrated services/open highways/market highways

He cited three levels of IOS participation. First, provision and receipt of information, second, shared applications and procedures, and third, utility services (i.e. IOS facilitators).

ORGANIZATIONAL IMPACT

With the introduction of IOS, the firm's strategic options are greatly broadened. Other impacts include:

- Competitive advantage
- Economies and efficiencies
- Establishment of relations in the market (societal, public interest, etc.)
- Productivity gains
- Shrinking user departments resulting from attrition and off-loading.

Further, discussing the features of IOS, he referred to it as a linkage between buyers and sellers resulting in efficiencies and influence. IOS also adds value to products and services. As a competitive weapon IOS provides strategic advantages in the form of low cost leadership, differentiation (e.g. through value-adding), and by facilitating focus, allowing concentration within a market. IOS can be used as a market barrier by preventing or controlling entry via the introduction of switching costs, or it can act as a market facilitator by promoting market actions, encouraging fairness and competition.

From a risk management point of view organizations, need to recognize that their risks increase with increased functionality and interconnectivity. Beyond a certain threshhold of functionality and connectivity, ordinary controls break down and specialized controls will need to be negotiated or determined. Furthermore, there are some levels beyond which the basic identity and sovereignity of a participating organization is threatened and thus no controls would suffice.

INDUSTRY AND SOCIETAL IMPACT

Under industry and societal implications of IOS, Konsynski discussed the following areas:

- Regulatory
- Judicial
- Employment
- Interchange
- Social value

Information systems are a statement of the culture and practice of the firm, and it also acts as an indicator of values. While the information systems is a policy statement of the firm IOS is a policy statement of the market. Referring to these policy statements Konsynski raised the question - "are the right people making these policy decisions?". He stated that the IOS is the guarantor of policy, determining the "hygiene" of the market and therefore is an opportunity to encourage desirable behavior. Technical standards have a major impact on business policy and those responsible for establishing such standards should be aware of their responsibility.

Finally Konsynski stated that policies are emerging both from within and from outside of the organization. Within

the organization, there is a danger that policies may evolve by "shear clerical action" which could be inappropriate for facilitating fair play and fair practice. In this context Konsynski stressed the need for broad policies establishing by the whole industry and warned that "if the industry doesn't get involved in policy the government will." He noted that IOS policies should address:

- Pressure to participate
- Benefits to early participation
- Intelligent filters
- Bias and influence
- Escorted transactions
- Control envelopes
- Transaction ownership
- Reshaping organizational boundaries
- Industry restructure

In closing he emphasized the need for national policy "so that people in business can get on with their business responsibility."

* For further reading refer "IS Redraws Competitive Boundaries" - James I. Cash, Jr. and Benn R. Konsynski (Harvard Business Review March-April 1985).

Carl E. Code - General Motors Corporation

Code approached the issue of IOS from the perspective of a user and discussed the dealer-supplier network communication system being developed by GM's Chevrolet-Pontiac GM of Canada vehicle group (C-P-C).

Code stated that GM was trying to use IOS to gain a competitive edge with respect to customer responsiveness and cost effectiveness in the intensely competitive automotive industry.

Emphasizing the need for timely and effective communication with suppliers, he said that, in the US alone, C-P-C has 1600 production suppliers producing 34,000 parts for 14 assembly plants.

The traditional manual process used up to the early 1970s for generating customer order for a specific make and model vehicle was:

- The dealer fills out a hard copy order form and mails it to GM headquarters.
- After 5 days the order arrives at the appropriate keypunch location.
- The order is keypunched and sent to the appropriate plant.
- The plant receives the order and within about 10 days completes all the manual processes for scheduling the vehicle on the floor.
- The vehicle is built.

The average MINIMUM turn around time for the entire process was 5 weeks. The process of forecasting requirements encountered similar delays:

- Sales forecast (Push System) is completed based on history.
- A forecast of the plant's need for parts and timing is done mechanically.
- The report is mailed to suppliers on a weekly basis.
- Within 5 days the supplier receives the report.

As a result of these cumulative delays the supplier received a report that was one week old, and could not respond fast enough to prevent materials shortage problems.

The inefficiencies and problems of this system caused C-P-C to take a close look at options for improving communication between itself and the dealer/supplier. In 1977 Chevrolet initiated a pilot teleprocessing system with 30 dealers. The pilot system, running on Rand/Burroughs equipment, provided order entry capabilities and coost $10,000. The program rolled out

nationwide within 6 months. Meanwhile GM's Materials Management developed electronic capabilities to transmit forecasted parts information to all internal and the largest external suppliers. By the early 1980s, the remaining outside suppliers were added to the system. During the late 1970s the company installed on-line material scheduling within its assembly plants (not linked with outside suppliers).

Code described GM's 1984 reorganization and subsequent acquisition of Electronic Data Systems (EDS). The reorganization which merged the 8 vehicle marketing, component, and assembly divisions into 3 groups, heightened the need for an integrated communication system with outside suppliers and dealers. Under the old organizational structure, each division developed its own system and dealt individually with suppliers and dealers. Prior to the EDS acquisition, the company had 28 independent data systems, 40,000 terminals, 51 major mainframe computers, and 68 front-end processors to direct network traffic, and multiple independent data processing centers. Centralizing data processing by the EDS subsidiary is projected to reduce the company's 34 data processing centers (28GM + 6EDS) to 14 by 1987. The combined firm's communication ability has been upgraded using IBM software. This was achieved by (a) Expanded System Network Architecture (SNA) throughout GM, and (b) System Network Interconnect (SNI) bridge gaps between networks. The SNI implementation resulted in a jump in user activity from 1000 to 15,000 in less than 6 months.

Code noted that the original dealer pilot program

evolved from its core car ordering function to include such features as :

- Determining order status
- Warranty, service, maintenance information
- Communication relating to financing incentives and new credit rates
- Information inquiry

The communication system involving suppliers evolved to electronic online capability and included such features as:

- Production point-of-use scheduling (electronic 'Kanban')
- Just-in-time delivery (Pull System)
- Supplier advanced notice of shipping (15 minutes)

He said that today over 99% of suppliers have electronic capability (teleprocessing or time-share) and the company planned to terminate all hard copy schedules in the supplier system by January, 1987.

In closing, Code summarized the company's learning experience in using IOS. He stated that significant education and training was required along with a new mental attitude founded on a trust in the culture change. He stressed the need for "getting on with the job" instead of waiting for the latest technology, combined with a "maniac on mission" mentality. For the future, Code envisaged an electronic communication system that would trigger supplier shipments direct to the plant at the time of the dealer order, and increased accuracy of information flow. This was needed for increased customer responsiveness and improved cost effectiveness.

Michael Marcus - MIT (on leave from FCC)

Marcus described a few IOS and looked at some of the

related impacts.

He began with the NASDAQ system which was developed about 10 years ago. The system had a revolutionary impact on the financial industry by bringing financial markets much closer to the Adam Smith concept of an ideal market. The system reduced inequities and improved the fairness of the market by enabling rapid (almost instantaneous) transfer of information. This feature enhanced stock liquidity, and enhanced the ability of for small entities to raise capital, thus making the marketplace more competitive.

Marcus then described the Compuserve system. Compuserve is an electronic information/videotext system that facilitates the marketing of products and services to individual consumers at a reasonably low cost. It provides nationwide marketing such that many small companies have discovered that they can afford to advertise and sell to a national audience via Compuserve. The consumer wins twice - through improved service as well as increased competition and efficiency.

Another example of effective IOS use is Telenet and other similar value-added networks. Telenet was developed about 15 years ago as a communications utility, providing the computer access to vendors who wish to market data and/or value added services across the country without having to install an extensive computer communication system.

Marcus' last example was the American Airlines (AA) SABRE system. He maintained that while AA was accused of anticompetitive behavior (a challenging policy issue in itself),

AA deserves praise for its great technological innovation and its willingness to take a tremendous risk. The SABRE system was the first major distributed reservation system. He stated that while AA may be accused of antisocial behavior in the way it dealt with its competitors, the key question is to what degree society should reward AA for taking the risk and developing such technology.

Referring to the GM case, Marcus stated that barriers to entry were unlikely to be a regulatory problem since it is in GM's interest to allow all suppliers to participate in its electronic marketplace. In effect, there would be no incentive for the company to deny entry to small suppliers.

Marcus commented that the Federal Goverment is not only a large user of computer communication systems but also a pioneer in networks equivalent to IOS. He cited ARPANET which facilitates user communications in the DoD research community, and CSNet, which enables easy communication between academics, as government sponsored networks.

In closing, Marcus referred to Konsynski's article which included the example of a chemical supplier developing a system for his customers, and raised the issue of anticompetitive use. Marcus stated that gaining a competitive edge through IOS innovation need not necessarily be bad provided it stays within the bounds of antitrust laws.

Speakers' Comments and Answers to Questions

Replying a question about GM's relationship between

their system and MAP, Code stated that the dealer and supplier do not use the MAP standard. However the factory floor systems are heavily MAP influenced.

With regard to travel reservations systems, a member of the audience solicited comments about the major gap in size between the purveyors (airlines) and the users (travel agents) of such IOS. Marcus suggested that the failure of users to improve their power vis-a-vis the vendors, may be a reflection of the travel agents' disorganization rather than any anticompetitive actions by the airlines. Konsynski supported the idea that the airlines (e.g.AA) should be rewarded with an earned competitive advantage for its technological innovation and risk-taking. He added that there should also be advocacy for the rights of small businesses and the public. In this context the Moderator added that travel agents would eventually evolve into travel advisors and counsellors rather than just order-takers.

In the light of the above, the question was raised as to whether the travel agent's business would change dramatically in the future. Konsynski stated that AA was already bypassing travel agents and that other airlines and hotel chains were following. Marcus noted that travel agents may not suffer by the loss of ticketing business as the profit margins on ticketing are very small.

Responding to the question of why GM took 30 years to introduce IOS, Code said that the problem was one of insufficient vision and inadequate technology. Competitive pressure has pushed to implement IOS. Further responding to a question of cost/benefit regarding the GM project, Code indicated that the

introduction of IOS had brought about an initial reduction in burden/labor effort (sales related) of 40%, reduction in work-in-process inventory of 97%, and a reduction in finished goods and input inventory of 50%. He contented that major cost reductions would continue.

Also with regard to security issues, particularly encryption of messages over long distance, Marcus clarified that the government's motivation was the prevention of unauthorized interception. Konsynski asserted that there was no reason for concern as long as the communication was safe and efficient.
