COMPUTERIZED COMMERCE

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COMPUTERIZED COMMERCE

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In the past few years we, as a nation, have begun to face the first serious economic competition we have ever known. The cars which clog our highways are, like as not, Toyotas or Volkswagens; our cassette recorders, pocket radios, and television sets were probably made in Japan; and most of the tourists I have seen recently are the newly affluent youthful Japanese. These are the observable results of a remarkable improvement in the foreign economic position vis-a-vis our own. The hard fact is that U.S. productivity in the past decade has increased at less than half the rate demonstrated by our major foreign competitors. If we plan to maintain our economic advantages, and I for one want to, we must take action.

Because our computer technology is well ahead of any other nations', we naturally and, I believe, correctly think of applying it to improve our manufacturing productivity. I believe that the single most important contribution computer experts can now make to our society is to apply computers to our industrial processes so as to reduce the cost in man-hours, energy, and resources of the goods and services we produce.

I am, however, deeply disappointed by recent widespread discussion of computer-controlled batch assembly or "the automatic factory;" I consider it a pipe dream, at least for my lifetime. We already have an able, willing, even eager, intelligent assembly device: a human being. As participants in our manufacturing system, people perform remarkably well, exhibiting enormous dexterity, great visual acuity, tremendous versatility, and a remarkable ability to "Do what I mean rather than what I say." It is very difficult indeed to replace people with computer-controlled hand-eye devices, and extremely difficult to do so economically.

Moreover, all the talk about computer-controlled assembly misses the central problem of our manufacturing system: the problem of handling information. Efficient production requires organization of large numbers of people, and within such organizations human communications inevitably go wrong. We forget how to make things we haven't made for six months; parts get lost in the factory, or

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worse yet in the national transportation system; and we forget to order critical parts or fail to check up on the vendor. Factory overhead rates of 200 percent or more are indicative of the cost of these human frailties. What we lack, and computers could easily give us, is a reliable way of telling our production people what to do, for making sure that they have the parts and the tools to do it with, and for reporting their successes and failures.

What we should be building is a system of computerized commerce: a "smart" communications network which can remember, process, forward, remind and schedule as well as merely communicating. Within individual factories such a system can coordinate the efforts of production people to improve production efficiency. Between factories, such a system can coordinate the efforts of many organizations so as to shorten the cycle from order to delivery and thus reduce inventory requirements and increase turnover. Such a system will apply automation not to production directly but to middle management.

If we build such a system we can achieve a new level of human freedom. Computers will become the repositories of manufacturing know-how: parts lists, purchasing specifications, lists of qualified vendors, design information, fabrication directions, and production history will all be stored in computers. Thus not only will we make the "corporate memory" of our organizations more independent of individual people, but also we will improve our ability to access the information in that memory, that is, to make use of our "know-how." Individuals will be free to take on new tasks more easily than ever before, because the instructions required for those tasks will be available through a variety of on-line computer terminals.

To build such a system will require three things. First, we will need some new technology, for although we have at hand the multi-access computer systems developed during the past decade as a basis for computerizing commerce, we lack standards for digital specification of parts, automated bidding and ordering, and automated commercial communications. Second, we must create a business environment in which computerized commerce can grow incrementally and each increment can pay for itself. Computerized commerce will be most productive when it is applied on a national scale, but we must somehow get there from here. And third, we must develop a new human trust of the capability and accuracy of the computer systems which will be managing our activities, because after all if we computerize commerce, for most people "the boss" will not be black nor female, but electronic.