A recent trend in microcomputer applications is the increased use of microcomputer networks for critical business applications. This exploratory case study focuses on American Sterilizer, one of the leading firms in the use of microcomputer networks. By migrating critical business applications from a mainframe to an enterprise-wide microcomputer network, American Sterilizer cut hardware and software costs by 70%. Productivity increased in user departments due to enhanced system response time and reliability. Users became more knowledgeable about their applications and developed an increased sense of ownership. Through an innovative approach to the management of microcomputers, these benefits were achieved without many of the risks normally associated with microcomputers.

As organizations attempt to achieve the economic and competitive benefits of systems integration, investments in telecommunications and systems integration services are forecasted to grow rapidly during the latter part of the 1980’s and 1990’s (Valovic, 1987). The goal is often described as an enterprise system, company-wide integration of computer resources and communication capabilities (Fleig, 1989). Many small firms and departments of larger organizations are relying on personal computers (PCs) and local area networks to achieve connectivity. For the most part, medium and large firms are relying on more traditional architectures, creating enterprise-wide networks of mainframe and minicomputer resources (Fleig, 1989). In larger firms, personal computer networks are implemented primarily to meet departmental computing needs with gateways provided to mainframe and/or mini computer systems where the firm’s critical applications and data bases reside (Francis, 1990).

Over the last five years, many firms have purchased a number of powerful PCs (Business Week, 1989). It is not unusual for PC processing power, taken as a whole, to surpass a firm’s mainframe processing power (in MIPS, millions of instructions per second) by more than a 50 to 1 ratio. If the firm does not use diskless work stations, PC disk storage capacity often
exceeds mainframe disk capacity by a ratio of more than 4 to 1. Often without realizing it, many firms have invested in PC information processing resources that exceed their mini and mainframe resources (Zarley, 1988).

PC and networking technologies are developing rapidly. The gap between desktop and mainframe/mini processing power is narrowing (Intel: The Next Revolution, 1988). Network operating systems can provide the same security capabilities available on mainframes e.g., user passwords, fault tolerance, security monitoring and access monitoring (Watson, 1988). Given the right set of data base and applications development tools, there is no reason why a network of PC workstations can not handle large data base intensive tasks ... more responsively and at far lower cost than a minicomputer or mainframe."

PC networks are a special case of distributed processing. They share many of the benefits and hazards associated with distributed computing. The benefits of distributed computing include increased reliability, reduced interactive response time, expansion of capacity in small increments, increased motivation and involvement of users, and decreased cost due to relative simplicity and lack of frills. Potential hazards include undesirable duplication, incompatibility, and incompetent design and implementation (Emery, 1977).

This exploratory case study focuses on American Sterilizer Co., a medium size ($270 million annual sales and 2500 employees) manufacturer of capital equipment for use in hospitals and clinics. This firm’s MIS director is planning to move all applications from two mainframe systems onto personal computer networks which are connected to form a PC-based, enterprise-wide area network (PC-EWAN). A PC-EWAN is a company-wide systems integration strategy that relies primarily on desktop computers and wide area networking technologies to meet a firm’s information processing, office automation, and connectivity needs. In the third year of a four-year conversion effort, one mainframe has been removed and critical business applications that used to run on this mainframe have been converted to run on PC-based networks.

A brief news release has identified American Sterilizer as a pioneer in the use of PC networks (Doll & Doll, 1989). This paper provides a more complete case study on the firm’s choice of network architecture and discusses the justification for moving critical applications from mainframes to PC-based networks. Implementation issues involved in building acceptance and commitment are discussed. The
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