

Chapter XVII

Developing a Telecommunication Operation Support Systems (OSS): The Impact of a Change in Network Technology

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ABSTRACT

The Telecommunications Act of 1996 opened competition in the telecommunications market in the U.S. and forced the incumbent telecommunications companies to open both their physical and logical infrastructure for competitive local exchange carriers (CLECs). In this case study we focus on the problems that face a CLEC with regard to designing an information system and getting a back office system, called an operations support systems (OSS), operational in a highly competitive, complex, fast-paced market in a compressed time frame when a change in a critical telecommunications network component, namely the central office switch, is made after 75% of the system implementation was completed. This case deals with the factors that led to this change in central office switches, its impact on the IT department, its impact on the company, and the alternatives considered by the IT department as possible solutions to the many problems created by this change.

ORGANIZATIONAL BACKGROUND

Starting in the 1970s, there have been many deregulation efforts in many sectors of the U.S. economy as well as internationally. The basic objectives have been to increase competition, improve service, and lower prices (Perez, 1994).

In the telecommunications sector, an abundance of new firms have emerged since the Telecommunications Act of 1996, both to provide new services such as data networks and wireless, but also to compete with established wire line telephone services. While deregulation opened the telecommunications sector for competition in these areas, many of the new services were made possible by the advent of new technologies: wireless services, broadband on a twisted wire pair (DSL), optical fiber, digital switchboards, the Internet and the Web standards. In many cases, the new entrants (CLECS) were the first to apply these newer technologies.

In the telecommunications sector, the Telecommunications Act of 1996 opened up competition for local voice and data services. The incumbents in the U.S., the Regional Bell Operating Companies (RBOC) called Incumbent Local Exchange Carriers (ILECs), were forced to lease infrastructure to the new entrants, namely, Competitive Local Exchange Carriers (CLECs). Many CLECs managed to get their business and associated networks installed and running in a remarkably short period of time. However, as Martin F. McDermott discusses in his book *CLEC* (McDermott, 2002), problems occurred primarily in other areas. One area that caused major problems was operations support systems (OSS) and its associated provisioning and billing related functions.

Thus, by 1999, there were political rulings, court rulings, and FCC orders that laid a foundation for competition in the local exchange (CLEC) telecommunications sector in the U.S. This was a go-ahead signal for many new companies. By 2000, there were more than 700 CLECs. Some of these were sales only companies (Total Resale)

and owned no infrastructure but used the ILEC infrastructure to sell telecommunications services using different market plans and lower prices since the ILECS had to sell services to the CLECS at a discounted (wholesale) price. Other CLECs were facility based and developed a network and switching infrastructure; in many cases using new types of equipment and technologies. For example, they used DSL (digital subscriber line) to provide both data and phone services on the standard local loop (2-wire pair).

Broadstreet Communications, Inc., an entrant into the facilities based CLEC arena in February, 2000, was formed by eight individuals who had experience working for ILECS, CLECS, cable companies, or teaching and consulting for the telecommunications industry. The founders determined that there was a reasonable market for combined voice and data services for small and medium sized businesses over broadband facilities using DSL technology and formulated a business plan based on this technology as a foundation for the company. Small and medium sized businesses were defined as having between 1 and 100 employees. Based on the business plan, the founders were able to acquire 62 million dollars in venture capital from 3 different venture capitalist companies. In addition, Lucent Technologies provided \$120 million dollars in financing for a total of \$182 million dollars of available capital. The company was headquartered in an industrial park about 30 miles southeast of Pittsburgh, Pennsylvania and established its service area as the mid-Atlantic states of Pennsylvania, Maryland, and Virginia, as well as Washington, DC.

A major part of the business plan was the utilization of information technology to contain costs and provide a high level of service to internal users as well as customers. This was the ultimate goal of the information system design but with the need to remain within the boundaries of the business plan. The difficulties of building an information system that would integrate all aspects of the highly complex telecommunications industry

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