Chapter XI

Management Challenges in Broadband Networking

Murali Venkatesh
Syracuse University, USA

INTRODUCTION

Organizations today face significant challenges in managing advanced telecommunications and computer technology. The digital convergence of applications–voice, video and data all in one "pipe"–confronts the technology manager with urgent new questions on the design and management of systems. Converged applications are new to organizations, as are the broadband technologies that transmit such applications. To a large extent, these technologies are discontinuous with existing solutions. This paper examines the implications of technological discontinuity for organizations in six communities in New York State. From the network manager's perspective, two broad sets of challenges are presented: technological – including specific issues such as bandwidth management and access and backbone issues, and applications– and those related to acquisition of technical support services. Applications prototyping is presented as a response to the technological challenges. The action research project (and the broader research program of which it is a part) underlying this chapter is focused on the public, nonprofit—including government and healthcare institutions, so-called social sector nonprofits, K-12 and higher education—and small business sectors, but lessons learned are broadly applicable.

BACKGROUND

In 1995, a performance-based incentive regulatory plan drafted by the Public Service Commission (PSC), the state of New York and the state's incumbent local exchange carrier (hereafter carrier) required the carrier to commit $50 million to a establish a program: "The stated purpose of the Program was to bring advanced telecommunications to economically disad-vantaged areas of New York State" served by the carrier (Annual Report, 1999, p.1). The fund would go to the development of advanced broadband community networks in selected, economically depressed zip codes in "urban/suburban" and "rural" areas. Participation in the so-called Diffusion Program-funded community networks was limited to public, nonprofit and small business *institutions*–city/county government, social sector institutions, K-12, non-formal and higher education, healthcare agencies, and small business units-located in or providing services to these zip codes.

Under the provisions of the program, participants could subscribe to telecommunications services at subsidized rates and receive some support for customer premise equipment or CPE—computer and networking equipment deployed at the user premise. In order to be eligible for these benefits, participants have to connect to the common infrastructure ("backbone"). This requirement was designed to encourage community institutions to find "common ground" and work together to realize community-wide objectives, and was proffered by our respondents as constituting the definition of a "community" network. In order to be successful, proposals had to document broad interest in "cross-functional" connectivity–i.e., schools connected to hospitals and not just to other schools-as well as sustainable, broad-based community support for the project and lasting benefit from it, a sound work plan, and sensitivity to the needs of the disabled.

A competitive request for proposals (RFP) process was used to select communities for a grant. "We were not interested in putting technology in place. User groups had to make a strong case that the investment would make a difference to the community in economic and social terms," a respondent said, explaining the decision to go with a competitive RFP process. Approxi-mately 80% of every grant went to the carrier to implement the infrastructure and provide advanced services; the remainder went to offset CPE costs and incidental training at the customer site. Grant funds could not be used to hire technical consultants or administrative staff. The program has funded over 25 projects in urban/suburban and rural communities over two rounds of grants. The second round is the program's concluding round.

Tariffed telecommunications services (i.e., widely available services governed by rates and rules subject to PSC review) were ineligible in the

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