Chapter 1.8
Convergence of the Internet and Telecommunications

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ABSTRACT

The local exchange telephone market is no longer considered to be a natural monopoly as a result of technological advancements. In particular, the power, versatility, and adaptability of digital technology has enabled traditional telecommunications companies to transition their network architecture from one based on copper wires and circuit switches dedicated to the provision of high quality transmission of point-to-point voice signals to a multi-faceted, general network based on fiber optic cables and packet switches capable of providing an array of voice, data, and video services. A network layers model is introduced to conceptualize the process of convergence to the Internet model. Convergence is fundamentally changing the nature of what it means to be a telecommunications company and promises to alter the market structure of many voice, data, and video markets. Convergence has pitted wireline telecommunications companies in a fierce rivalry with cable companies for voice, data, and, increasingly, video services. More generally, this research provides a framework to explain the convergence of communications networks and identifies and analyzes key issues that confront public policymakers. One key competition issue, termed network neutrality, addresses the concern that the evolving broadband network architecture will enable network providers to favor the provider’s services or affiliated services at the expense of independent rivals.

INTRODUCTION

At the close of the 20th century, a traditional, prototypical telecommunications company provided high quality point-to-point voice services utilizing a technology specially designed for transmitting voice signals. This wireline architecture was comprised predominantly of copper-based local loops, circuit switches, and local transport and long distance conduits that incorporated some fiber-optic technology. In such centralized phone networks, intelligence resided in the core of the network in the switch technology, not in the end devices connected to the network as it does in the decentralized Internet
architecture. In such a network, the provision of
the service, voice, was closely identified with the
underlying physical infrastructure that provided
the service. For much of the 20th century, United
States telecommunications companies were
thought to be natural monopolies in the provision
of voice services and thus subject to regulation in
dual jurisdictions, at the state and federal levels.
More generally, regulation of electronic commu-
nications networks was based on the premise that
a particular service (such as voice, data, or video)
was inextricably linked to a specific underlying
infrastructure used to provide the service.

With technological improvements in digital and
network technology and the spectacular growth
of broadband technology and the Internet at the
end of the 20th century, the traditional architecture
of phone networks (and other communications
networks) and the scope of regulation of telecommu-
nications companies are gradually changing.
Telephone companies are transforming their provi-
sion of voice and other broadband services from
copper-based networks to advanced fiber-optic
networks. The purpose and scope of this research
is to describe and analyze the restructuring of
telecommunications networks and telecommunications
companies as they respond and adapt to
technological and economic changes.

As telecommunications/entertainment/in-
formation networks converge to an advanced,
multifaceted architectural broadband platform
that is capable of offering an integrated bundle
of voice, data, and video broadband services, it
is incumbent on regulatory authorities to change
the nature of the regulatory approach toward
these telecommunications companies. A pattern
of deregulation is in process but there still exist
unanswered questions regarding the appropriate
regulatory response to convergence. Convergence
is creating new competition/regulatory issues in a
variety of formerly distinct industries. Peha, Lehr,
and Wilkie (2007), three leading Internet scholars,
argue that “At root, the debate is about the future
of regulatory policy for the communications sec-
tor as we move toward a post-convergence world
where legacy industry boundaries and regulation of
cable television, broadcasting, and telecommunications
need to be reconciled with the challenges of
competition among broadband platform services,
based on the Internet” (p. 710). For instance, as
the telecommunications network converges on
the Internet model, telephone companies have
discussed implementation of a two-tiered (non-
neutral) Internet that would replace the standard
practice by Internet service providers of treating
generally all kinds of packets in the same manner
(i.e., neutrally) regardless of the application or
provider. Observing a neutrality principle implies
that broadband access providers do not favor some
packets at the expense of others, that is, there exists
a lack of discriminatory behavior toward applica-
tions and content utilizing the network.

A two-tiered Internet can be viewed as a
strategic maneuver by vertically integrated
broadband service providers to gain a competitive
advantage in the market for Internet services and
applications. Richard Notebaert, Chief Executive
Officer of Qwest Communications, for example,
argues that telephone companies should be able
to negotiate commercial agreements with content
providers such as Google or Amazon to give
Internet companies an advantage over rival firms
because, “we’re all trying to provide a little bit of
differentiation for a competitive edge. That’s what
business is about” (Reardon, 2006a). With a non-
neutral Internet, broadband access providers install
intelligence within the network in order to favor
some packets and disfavor others and, hence, exert
control over applications and content utilizing
their network. The controversy over implementa-
tion of a non-neutral platform is captured in the
term net neutrality. Potential competitive issues
arising from the design and implementation of a
two-tiered broadband architecture involve (1) a
telecommunications company’s treatment of an
emerging Internet service (such as Voice over
Internet Protocol (VoIP)) that competes directly
with the company’s core, legacy service, (2) a

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