

STRATEGIC IMPLICATIONS OF DISRUPTIVE INNOVATIONS ON THE CANADIAN TELECOMMUNICATIONS INDUSTRY

by

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ABSTRACT

Disruptive forces are impacting the telecommunications industry. In the near-term, these innovations will spur competition from alternative network providers seeking to provide equivalent services at a lower cost and a lower price. Medium term threats include service, content and application providers that seek to relegate telecom firms to being “pipe providers”. Longer term implications come from the fact that service and content providers will begin to reach through the network and take ownership of the customer.

This paper discusses the technological and business innovations impacting the industry and compares it with the current state of the industry and the current strategic focus of TELUS. It then provides strategic recommendations that TELUS can use to effectively meet the key success factors crucial to succeeding in the changing telecommunications industry and secure its role in the communications domain of the future.

Keywords: telecommunications; TELUS; disruptive innovation; strategy

DEDICATION

To Diana, the light and love in your eyes brightens my life.

And to Grayson, whose laughter and *joie de vivre* brings joy to it.

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GLOSSARY

ADSL	Asynchronous Digital Subscriber Line
ARPU	Average Revenue per user
BPL	Broadband over Power Line
Broadband	High-bandwidth internet access methods (i.e. ADSL, cable, WIMAX)
CBA	Collective Bargaining Agreement
CLEC	Competitive (non-incumbent) Local Exchange Carrier
CO	Central Office
CPE	Customer Premise Equipment
FTTx,	Fibre-optic based access networks. "x" stands for either home, neighbourhood, curb or node
Gbps	Gigabits per second
GPON	Gigabit Passive Optical Network
IEEE	Institute of Electrical and Electronics Engineers
ILEC	Incumbent Local Exchange Carrier
IMTU	International Multimedia Teleconferencing Consortium
IP	Internet Protocol
ISP	Internet Service Provider
ITU	International Telecommunications Union
IXC	Interexchange Carriers
Kbps	Kilobits per second
LNP	Local Number Portability
Mbps	Megabits per second
MNC	Multinational Corporation
Mobile-Fi	Mobile-Fidelity
MSO	Multiple Services Operator. A term used for cable companies offering multiple services such as data, voice and video
Narrowband	Internet Access method that features low-bandwidth 54 kbps connection speeds (i.e. telephone modems)
NSP	Network Service Provider
OSS/BSS	Operations and Business Support Systems
PDA	Personal Digital Assistant
SCP	Service Control Points
STP	Signal Transfer Points
TDM	Time-Division Multiplexing. The traditional method to transmit voice signals prior to IP
VNO	Virtual Network Operator
VNO	Virtual Network Operator
VOD	Video on Demand

Wi-Fi
WIMAX
WLNP

Wireless Fidelity.
World Interoperability for Microwave Access
Wireless Local Number Portability

1 INTRODUCTION

Given the fundamental technological and business changes occurring in telecommunications today, there's a lot of discussion in industry circles about the role that telecommunications firms will play in the communication domain of the future. Obviously, any prognostication is, at best, an educated guess based on interpretation of impacts of probable events, expertise, perspectives and biases and a lot of assumptions. For instance, the cellular telephone, broadband, and the Internet have all become ubiquitous and essential where 10 years ago they would have been regarded as frivolous luxuries. Few would have foreseen how ubiquitous these products would become. Clearly, most of these products were introduced and popularized by the telecom industry as each firm sought to retain, gain and increase wallet share. The adoption of these products has been critical to the viability of incumbents faced with significant decline and revenue erosion from its traditional wireline revenue.

The innovations that are on the horizon however, don't hold the same promise for telecommunication firms. The disruptive forces brought forth by Instant Messaging and Unified Communications suites, Voice over IP, alternative broadband and connectivity options and new business models that undermine the traditional telecom revenue model will all impact the competitive landscape. Furthermore, new business models, facilitated by technological evolution, are evolving much faster than traditional telecom providers. This puts

telecommunication firms in a highly reactive mode where their organizational structures, processes and cultures have to shift rapidly. This is highly problematic given that, with their history as regulated monopolists, agility is not one of the strongest organizational traits of telecommunication firms.

Furthermore, the disruptive innovations on the horizon bring about critical questions regarding the long-term viability of and the role that telecommunications providers will play in this new communications landscape. Will some providers become "smart" utilities that are able to meet customers' needs, operate cost-effectively, and remain relevant to the communities they serve? Will others operate as mere pipes for generic connectivity services and selling their bandwidth to whoever will pay for it? Will carriers become content, service and connectivity conglomerates, differentiating themselves by means of content, brand, range of handsets and service tie-ins? It is difficult to tell which of these scenarios, if any, will prevail. What is clear is that there will continue to be a need for people to communicate and thus a need for firms that will service that need.

1.1 Scope of analysis

In addition to fostering, pioneering and deploying sustaining innovations that help sustain industry growth and vitality, companies now must also understand the potential disruptive nature of both new technological capabilities and business models. These innovations are those that provide users with the same functionality yet don't provide the same revenue to telecom operators. They are innovations that if they were to become ubiquitous, easy

and intuitive to use could significantly alter consumer preferences and usage habits. Most importantly, they are innovations that, if brought to the market by well-managed, well-resourced firms could challenge even the largest incumbent carriers.

This paper will discuss the longer term implications of various disruptive innovations and how they may impact the role that telecommunications firms play in the communications industry. The method by which this paper will do this is as follows. Section 2 describes the basic concepts behind disruptive innovation and the technological underpinnings driving it. The second part of Section 2 will discuss the relationship between these innovations and the business models that look to exploit these innovations.

Section 3 will describe the key competitive dynamics governing the telecommunications industry today while Section 4 will focus on TELUS' current strategic focus and organizational capabilities. Section 5 will evaluate TELUS' current strategies and capabilities and compare these with the requirements and challenges posed by the disruptive innovations on the horizon. Lastly, given that the disruptive impact of any innovation very much depends on how firms respond, plan and create opportunities from them, it will also describe and propose strategic and structural ways to mitigate the impacts and ultimately profit from the changing landscape of telecommunications.

2 DISRUPTIVE INNOVATION IN THE TELECOMMUNICATIONS CONTEXT

There's no question that disruptive technology has already begun to have an impact, though still relatively small at the moment, on the way that homes and businesses receive and use local telecommunications service, and on the structure of the industry.

Its very likely that this evolution is going to continue, and that at some point in the future – your guess as to exactly when is as good as mine – the vast majority of consumers will be using, and providers will be delivering, local telecom services in ways very different from what we see today.

Indeed, it's not unreasonable to assume that sooner than we might expect, some other disruptive technology that hasn't occurred to anyone today will appear, and will shake things up all over again.¹

2.1 A view into the future

In his book, *The Innovators Dilemma*, Christensen uses the term disruptive innovation to illustrate that certain innovations are different from normal innovations in one very important way—in what seems like a blink of an eye, they

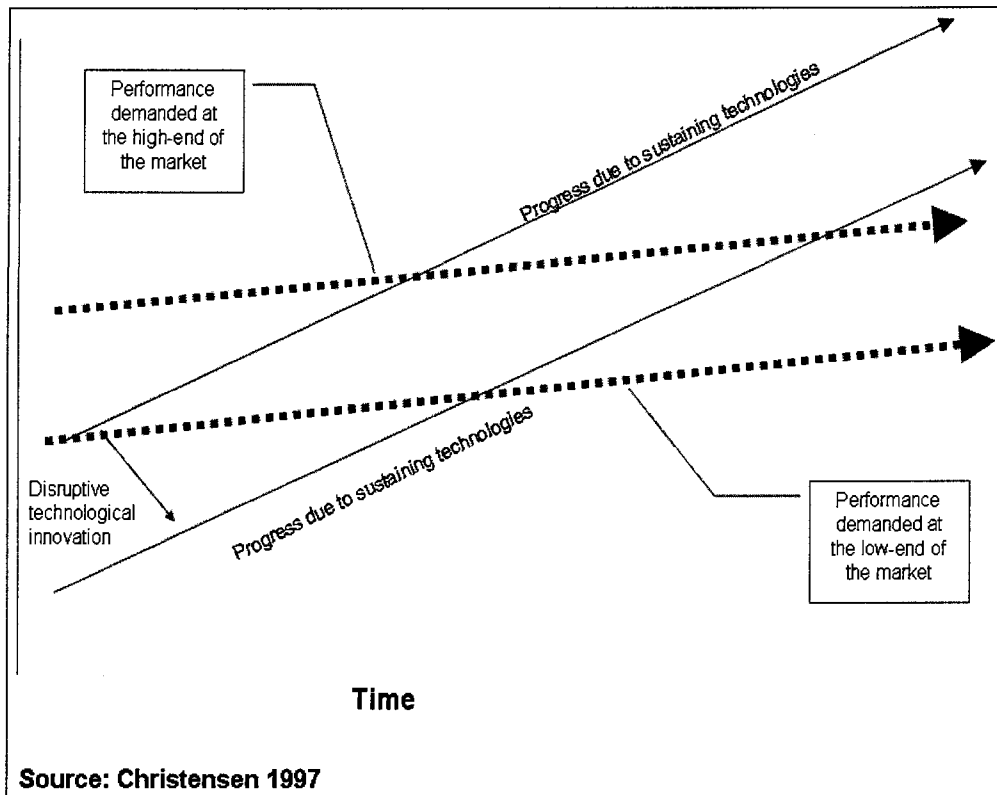
¹ Notes for an address delivered by Andrée Wylie, Vice-Chairperson, Broadcasting, CRTC. To the 2004 Telecommunication Invitational Forum, Cambridge, Ontario April 20th, 2004

can make large, well-established organizations and industries obsolete. (Christensen 1997).

The mechanism by which a new technology displaces an existing technology is shown in Figure 1. At the most basic level, the Innovators Dilemma states that a disruptive innovation usually begins life as simpler and inferior to existing technologies. As such it is usually cheaper and less complex. Therefore, because the technology either doesn't perform at the level demanded by the mainstream market or emphasises attributes and features that the mainstream market does not value, mainstream users do not adopt it. Given that the mainstream market is not a viable target for the technology, these innovations first gain a foothold in either the low-end of an existing market or in a new market altogether.

After it establishes a foothold and the necessary revenue stream, the firms that sell products and services based on the technology seek to attract more customers by continuously improving the product. Meanwhile, existing technologies, because they are also improving because of continued investment by incumbent firms eventually begin to "overshoot" the demands of the mainstream market. Eventually as the disruptive innovation begins to meet the performance requirements of mainstream users and because it is simpler and cheaper and because existing technologies offer far more capabilities than required by the mainstream users, disruptive technologies begin to displace the existing technology.

Figure 1: The evolution of a disruptive technological innovation



Christensen's concepts arise from his research involving computer disk-drive manufactures. While the telecommunications industry is not involved in manufacturing devices nor is it generally considered to be as innovative as the semiconductor manufacturing and other more patent-driven industries like biotechnology and health sciences fields, there are key concepts in Christensen's theory that hold significant implications for the telecom industry.

One of them is the distinction between a sustaining innovation versus a disruptive innovation and the impacts that each one has on current and future strategies commonly applied in the telecommunications industry. A disruptive innovation may displace existing technologies but does not necessarily threaten incumbents. An example of this is the cellular phone industry. The meteoric

adoption of cellular phones is an example of new technology creating new markets and attracting users, however, because the cellular business model is very similar to that of wireline telecom, telecommunications firms were able to easily acquire, partner with, or internally create a cellular operation and integrate it into their operations. This similarity in structure and business model has greatly benefited a company like TELUS which has successfully been able to integrate wireless operations into its business model and thus able to mitigate revenue erosion from landline access and toll revenue.

This is because at its core, a disruptive innovation combines both technology and business models in such a way that firms are able to attract, retain and grow customers profitably and also make it difficult for incumbents to effectively compete given the significantly different revenue models and competencies required. In short, truly disruptive innovations combine a specific set of technological characteristics with specific business model constructs such as revenue model, process, culture and structure in compelling and mutually-reinforcing ways.

Another is the potential impact of innovations occurring in related industries such as personal mobile computing and content creation and distribution. Disruptiveness is a relative concept in that technological innovations are sustaining to industries while disruptive to other industries. A case in point is the ability for cable companies to offer phone service via their cable network. Clearly, this ability is disruptive to the telecom industry while sustaining to the

cable industry. Similarly, the ability for telecom providers to provide TV service is disruptive to cable companies while clearly sustaining to telecom firms.

Another is the impact that disruptive innovation may have on consumer preferences, consumption habits and market dynamics. Disruptive innovations not only duplicate existing functionality but combine these with new capabilities in compelling ways. This combination essentially shifts the markets valuation criteria for similar services and products and changes the value creation dynamic that firms operate under.

An example of this is the impact of e-mail on business correspondence. Few would argue that e-mail, despite its many shortcomings, has not displaced the phone and other correspondence mechanisms such as memos and letters as the preferred method of communication because it provides both speed and a means to record and manage correspondence in a way that was not practical with voice conversations. Many businesses consider access to e-mail as more critical to operations than their phone systems.

Perhaps most important of all is the uncertainty factor that disruptive innovations bring to long-term planning and strategic formulation. To be clear, the telephone network and the industry that supports it will be around for a long time given the extraordinarily high cost of establishing alternative communication networks. In this respect, firms can plan to compete and operate along the same dynamics governing the industry today.

However, what firms cannot plan for are which technological and business innovations will allow entrants to effectively grow from niche providers to bona-fide competitors and how they may change the nature of competition in the industry and therefore which competitive levers to use to address them. Furthermore, given very real and important near and medium term competitive, customer and shareholder demands, firms do not know if strategic decisions being made today will help or hinder their ability to address the competitors of the future. The best that firms can do is become more agile, reactive and highly flexible and to develop broad competencies in recognizing and quickly creating strategies around disruptive innovations. This puts a premium on an organization's ability to innovate, quickly recognize opportunities and threats, adapt accordingly and execute effectively. All of which is something that large, highly bureaucratic telecommunication firms are not particularly known for.

2.1.1 The future user

While it is impossible to actually pinpoint what the future looks like it is easier and more helpful to envision how a rational consumer would value communications services of the future and in turn what the future network provider will most likely look like.

Consider a present day scenario. A teenager sitting at home, using a PC connected to the Internet via a high-speed ADSL connection is using a freely available unified communications application to join a chat session with friends. During this session they may share pictures, links to websites, music and even play on-line games. While chatting, they notice that a friend, who is travelling in

Europe, has just signed on. They know this because the application they're using indicates whether friends are online or unavailable. Seeing this, they decide to surprise their friend by using the application's integrated Voice-over-IP (VoIP) calling capabilities to initiate a conference call. The friend receives the call on the computer he's rented at an Internet café and they discuss where they'll meet for dinner when the friend comes back in two days. After the call, they exchange e-mail or SMS messages to confirm dates and times.

The scenario described above is notable for several things. First, communications users are choosing to use alternative forms of communication that are cheaper or free in spite of the better quality offered by traditional communication methods like wireline telephone service or even cellular phones. Thus the only source of revenue that a telecom provider gets from the scenario described above is the monthly access fees from the monthly subscription costs of the ADSL line. If that access was changed to a high-speed connection provided by a cable company or an alternative provider, a telecom provider would not see any revenue. In the near future, cellular phones will be able to automatically switch between traditional cellular network and alternative networks giving users another cheaper alternative to traditional cellular calling.

Second, it highlights an increasing trend towards consumer preferences for applications that are more integrated, more intelligent, portable and less constrained by the underlying network. Indeed, current users already have a plethora of communication media available to them. The Internet, e-mail, Instant-messaging, chat and voice are commonplace. The communications user

of the future will want to be able to easily manage this capability preferably through a single interface and also be able to personalize it according to their preferred mode of communication. Supporting this flexibility and ease of use, users will want to have a single integrated communications experience whether at work, home or play. This means that they will want the option to have the same capabilities whether they're in the office, watching TV, playing games on an Xbox, or walking to the store. Users will increasingly not want to manage multiple communications devices and address books or communications mechanisms. The result of this will be the prevalence of increasingly intelligent devices and applications that are able to help manage and simplify the communications experience regardless of the particular underlying network required to facilitate the communication.

Lastly, none of the communication sessions above required the intervention of a central network operator. The network in the middle is simply a conduit for data. All the intelligence and communication management functions are performed by the communication applications themselves. Furthermore, as these applications become more available as Internet on-line applications where they are accessible from any device connected to any network, the actual network that is being used becomes less relevant. This means that users will increasingly perceive the network as a commodity and will be less inclined to pay a premium for it.

2.1.2 The future provider

The network of the future will no longer be the central controlling entity that manages all communications sessions. Instead it will be a conduit that facilitates the transmission of data between two intelligent end devices or applications. Furthermore, networks will be simpler and exploit wireless technologies even more. What this means is that, generally, networks will present less and less of a barrier to applications and instead become application enablers. More importantly for the structure of the telecom industry, as high-speed networks become the norm, network operators' power will ebb away toward integrators and software developers.

At the same time, the location of information-processing power will matter less. Communications applications and more networking intelligence are likely to be put in mobile phones, devices or in servers not necessarily linked to the owner of the network. As this network becomes more common and as non-telecom firms gain expertise with exploiting and harnessing this network to support their particular business models, ownership and control of networks will no longer be enough of a driving force for long-term growth in the telecom market.

Skype and Vonage are companies that are already making in-roads into the telecom market. These firms don't own network facilities yet offer cheaper or free telephone service. Companies like Microsoft are integrating functionality into their software products that will allow users to "hop" from one wireless hotspot to another, effectively making any PDA or laptop running the Microsoft Operating System into a mobile communications device that allows free Voice-

over-IP calling. Another potential entrant to the telecom industry is IBM, which can offer network provider services to its customers by becoming a Virtual Network Operator (VNO). Other operators may be local municipalities offering metropolitan wireless services, electric utility companies offering Broadband over Power lines (BPL), Internet Service Providers (ISPs) who provide voice communications as a free add-on to a service bundle or an advertising company like Google, which is willing to provide users free wireless access in the hopes that it will support its advertising based revenue models.

As users communications needs become more sophisticated and end devices become more intelligent the less the network becomes a vital factor for consideration. In this future world, connectivity and access is considered an essential service and as long as it is "good enough", will increasingly be perceived and consumed like a commodity. In this future telecommunications landscape, users will assess providers based on how well they are able to provide cheaper, simpler, more integrated communications services and applications and not necessarily care whether that turns out to be TELUS, Microsoft, AOL or Google.

In turn, firms will assess the viability of the telecommunications market not in terms of direct toll and access revenue but on how well it supports and complements their existing revenue models and service offerings. An example of this is Google, which seeks to leverage free wireless access and a unified communications application to drive their advertising and location-based advertising revenue models. Microsoft on the other hand seeks to differentiate

their product line by embedding integrated communication capabilities into their software products. Electric utility companies are also considering providing network connectivity over power lines. Although still in early stages, this would make the electricity grid a direct alternative to either an ADSL or a Cable connection for high-speed internet access. In essence, this would give the electric utility companies the largest networking infrastructure in the industry and a significant competitor for the “last mile” infrastructure that is currently owned by the telecom and cable companies. Internet Service Providers are becoming telecom and cable firms by bundling phone services and TV with their Internet Service packages. The various scenarios described above will be discussed in more detail in Section 2.3.

Although, the actual firms that decide to enter the industry may change, it is clear that the combination of technology, consumer preferences and economics are driving a new paradigm.

2.2 Technology

The technological foundation of telecom disruption is the Internet. The Internet and the protocols underlying it is a classic disruptive technology. It was designed to solve a different set of problems and had no features that mainstream telephone users would want. The Internet was designed to address a cold war concern that computers which were networked via dedicated point-to-point data links were vulnerable to disruption if the communications network had failed as a result of an attack or a catastrophe. The Internet protocol solved this problem by allowing messages to be routed through any point in the network

to get to its final destination. The second problem the Internet protocol solved is the fact that computer networks could not talk to other networks owing to their proprietary and limited protocols. The Internet solved this problem by adding an *Internetworking* protocol which gave rise to the network of networks that we know today as the Internet. The key features of this new networking method were:

1. An open, common and free protocol

Prior to the Internet, networking systems, including the telephone network, were generally proprietary, relatively expensive and also tended to be limited by geographical and performance constraints. These networking protocols were determined by a handful of manufacturers who in an effort to maximize market share made it difficult to have computers on different networks communicate.

In contrast, the Internet was not proprietary to any single manufacturer, its mechanism for networking was available to any interested party and it was also free. Perhaps most importantly, it also evolved to allow communication between different networks thus making inter-networking, also known as the Internet, possible.

2. Best-effort delivery

Previous networking protocols managed the delivery of information to the end devices. While this paradigm allowed for simpler end-devices such as telephones to outsource the management of messages to the

network, it came at the price of network complexity, cost and performance. The Internet on the other hand is fundamentally a best-effort network that relies on end-devices to manage the delivery and presentation of messages. This paradigm removes the requirement for a central controlling mechanism that manages receipt, retransmission and ordering of information thus providing a lightweight, highly scalable, highly consistent protocol that allows networking to be cheaper and easier to manage and adopt.

3. Network abstraction

Prior to the Internet, users of networked computers needed to understand the specific protocols and physical electromechanical characteristics of the underlying network in order to design applications that could communicate across networks. This is because there was very little separation between the software (application, logic and information presentation layers) and the hardware (electromechanical, transport and routing) layers. From the outset, the Internet protocol allowed users to abstract the physical implementation of networking mechanisms so that applications and computers only needed to communicate in generic Internet terms rather than in specific hardware based protocols. This unbundling of the communications stack meant that application developers could focus on functionality and leave the actual networking implementation to other components.

These factors helped make the Internet the *defacto* networking standard that it is today. Furthermore, the Internet, like the telecommunications network, is an example of a good that exhibits positive network externalities in that the utility derived by the consumer increases as more consumers use it. This drove the widespread digitization of content which drives the commercial, educational and informational value of the Internet.

2.2.1 IP Telephony and VoIP

It is important to classify the Internet into both the *public* Internet that most users are familiar with and the private Internet which is the network not accessible from the public domain but used within organizations by authenticated users and applications. Both use the same set of Internet protocols and therefore are both IP-based networks. The difference is the public internet is not managed by any single entity while the other is owned by an organization. For the purposes of this paper we will refer to both interchangeably unless specified otherwise.

The ITU defines Internet Protocol (IP) Telephony as the “transmission of voice, fax and related services over packet-switched IP-based networks”².

Further, the ITU defines specific sub-sets such as Internet Telephony and VoIP:

Internet Telephony: IP Telephony in which the principal transmission network is the public Internet (Internet Telephony is also commonly referred to as “Voice-over-the-Net”— VON, “Internet Phone,” and “Net

² ITU, IP Telephony Workshop, 29 May 2000

Telephony" — with appropriate modifications to refer to fax as well, such as "Internet Fax").

Voice-over-IP (VoIP): IP Telephony, in which the principal transmission network or networks are private, managed IP-based networks (of any type). (Depending on the type of network, you can have "Voice-over-frame relay," "Voice-over-cable," and "Voice-over-DSL" or "VoDSL," as examples).

Unlike a traditional public switched telephone network (PSTN) and a cellular network, the Internet originally was not designed as a dedicated real-time network for voice communications. It was designed as an asynchronous data communication network, allowing data packet loss and retransmission, without dedicated bandwidth for each user. Also, unlike PSTNs and cellular networks, the Internet consists of disparate networks and service providers with no single controlling entity that manages the quality and flow of messages across the entire network. This combination of factors makes the Internet a challenging network medium for real-time communication scenarios such as voice conversations.

Despite these issues, the use of an IP network for voice calling took hold as a cheaper alternative to using traditional telephony networks. Early adopters and vendors of IP telephony services sought to exploit the fact that IP telephony is a data service rather than a voice service which means that it falls outside the control of traditional regulatory bodies and telecommunications industries. One of the earliest commercial applications of IP Telephony was in the long-haul,

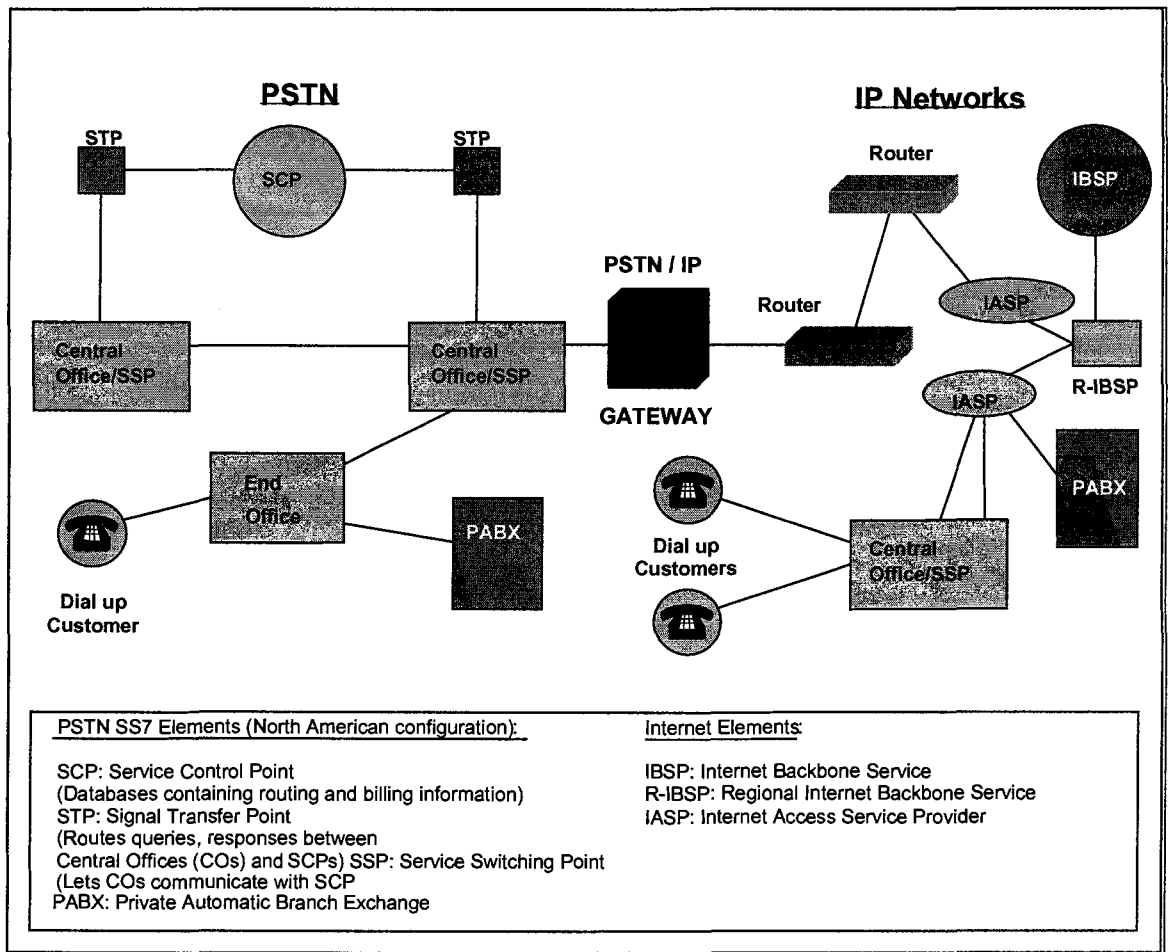
international long-distance calling markets used by pre-paid long-distance calling card companies that sought cheaper alternatives to traditional international calling rates given that the prepaid long-distance calling card market is extremely price sensitive and users are willing to accept lower voice quality. As the technology improved and voice quality approached that of traditional telecommunications networks, traditional telecom operators began to use IP-technology protocols and technologies to facilitate backbone traffic. As shown in Figure 2, operators would interconnect both an IP-network and a telecom network via a gateway that would facilitate the exchange of traffic between the two.

Like most disruptive innovations, the technology and various applications it supports are well known to incumbents. Indeed, used in this way, IP telephony complemented the traditional telecom revenue models by providing operators with cheaper, more flexible ways to carry voice traffic.

2.2.1.1 Disruptive characteristics

Ironically, the simplicity, flexibility, transparency and openness of IP that made it attractive to network providers also make it an ideal platform for disrupting the telecommunications industry. In particular, four key characteristics of this new communication network changes the dynamic of what's possible in communications:

Figure 2: Interconnection of IP and Telecom networks



2.2.1.1.1 A logical hierarchy

A telephone network is structured according to a geographical hierarchy. This is seen in the structure of telephone number. Each termination point in the telephone network has a unique, geographically-segmented telephone number. On the other hand, IP defines a "logical subnet" for each organization (university, enterprise, public office, or ISP) and transfers packets along this logical hierarchy. Furthermore, the actual physical footprint of this logical network could span buildings, cities, countries or continents. In this new topology,

all nodes are equal in that they are all part of the same logical network regardless of distance from any other node.

2.2.1.1.2 Peer-to-peer communication

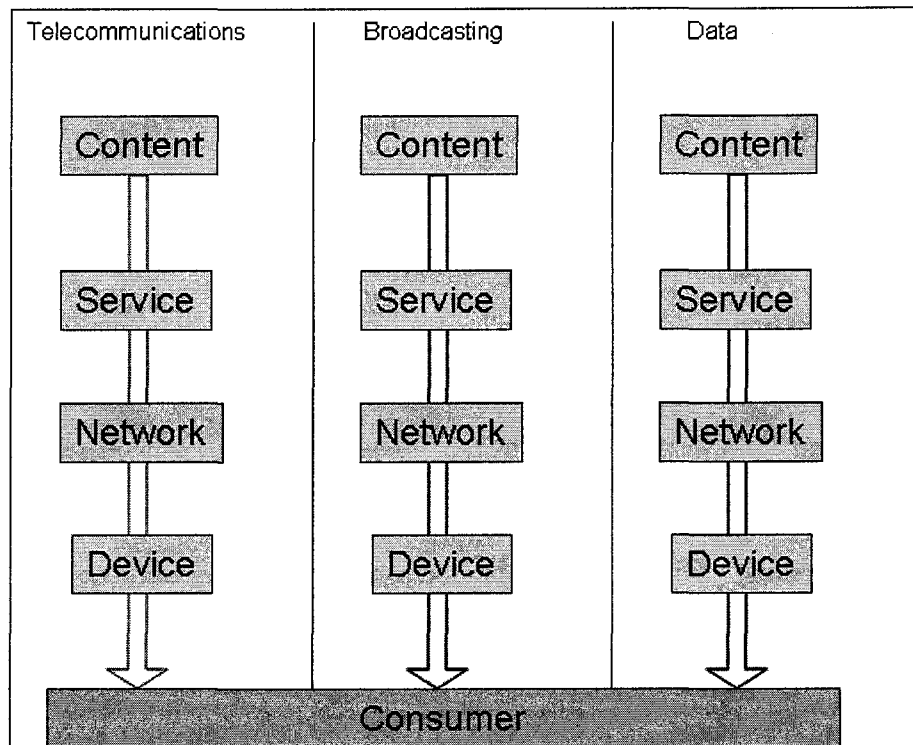
Traditional telephone networks imposed a hierarchy whereby end devices simply provided the destination number information along with call termination and initiation. The ringing, dial and busy tones we hear when we place a call are all generated by the network. The "intelligence" and critical mechanisms that facilitate communications resides in the core network management elements known as Service Control Points (SCP), Central Offices (CO's), End-offices and Signal Transfer points (STP) (refer to Figure 2 for illustration). In this hierarchy, calls must transit public exchange points that are owned by either Regional or Interexchange carriers (IXC). The rate that the end user is billed is comprised of the accumulated usage and access charges incurred as the call transits through the various network operators and owners.

On the other hand, an IP-network does not impose an internal hierarchy of end-devices versus controlling and routing devices. All devices are able to perform these roles and all can be published as Internet routing points on the public Internet. Similarly, connections between different network owners are generally structured as peering arrangements settlement charges are based on aggregate rather per-user data traffic. This allows the flat-rate pricing that typifies Internet based services.

2.2.1.1.3 Service and Network abstraction

In the telecommunications paradigm, the network *is* the service and the network owner *is* the service provider. Access to the network, (whether through physical wires or radio waves for cellular calls), is controlled and owned by the telecommunications firms. Likewise, the services offered in that network, whether it be long-distance toll and toll-free calling, pay-per-use and subscription services such as voice mail, call forwarding, Directory or Operator Assistance, are only available to consumers if the network owner makes it available to users. At one time, even end devices like telephones were not available for purchase but only provided as rental units by the telephone company. Cable companies also followed the same model creating a situation where a separate network was required to facilitate voice, video and data transmission. Each network defined a different set of content, services, standards and end-devices that could connect to it. TV was always carried on Coax, whereas voice communications is tied to the PSTN and Data services were delivered by dedicated data links or Telephone modems or ISDN lines to PC's. As shown in Figure 3 below, this resulted in vertical silo's that are very different technologically.

Figure 3: The bundled communications platform

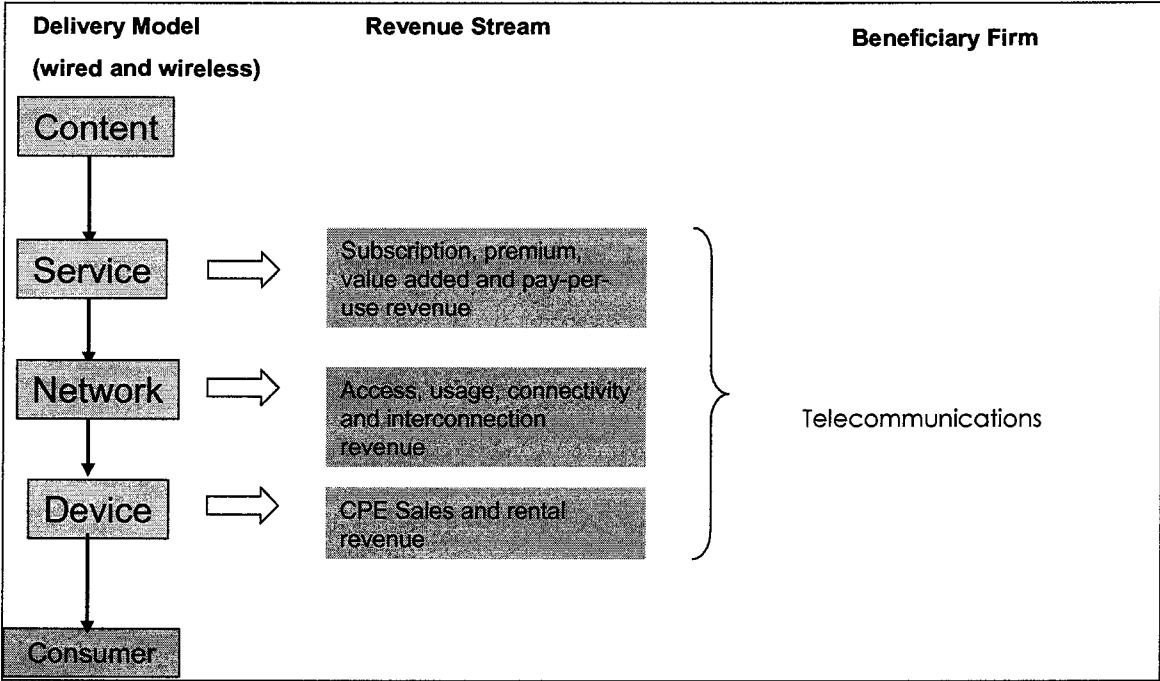


Source: Adapted from "Business role model for Broadband access". T.Monath et al, Dec 2004

This paradigm meant that users of one telephone network did not have access to services offered by other network providers also manufacturers and service providers that sought to sell services to end users of telephone services needed to sell those services to the telecommunications firms first, who then resold these services to end users. It also meant that users needed to engage with different service providers for the type of service they required. As shown in Figure 4, this tightly integrated telecom service delivery model allowed telecommunication firms to gain revenue from the entire communications delivery platform. The revenue mix varies depending on the particular usage

characteristics and competitive dynamics in a given market but the model remains consistent for most providers.

Figure 4: Telecom Revenue model



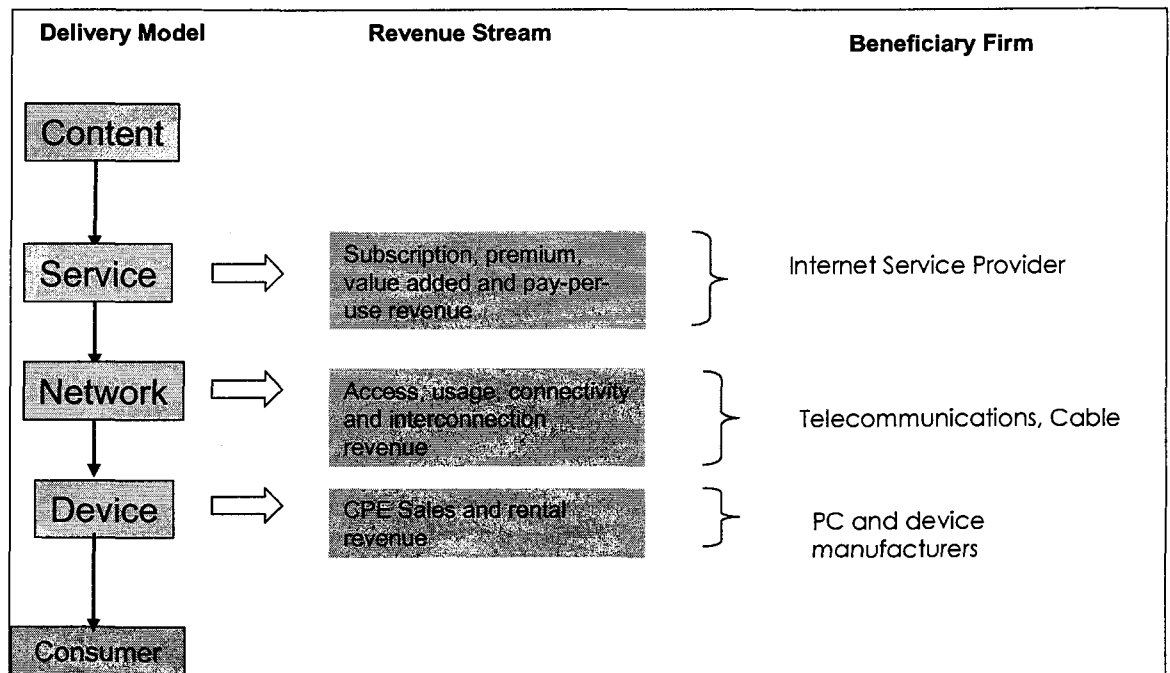
The first significant separation of access from services occurred with the advent of long-distance deregulation when users could have their local service with one provider and long-distance service from another. Even then, allowing individual users to switch long distance providers required active participation by the local service providers.

The Internet In contrast, has always abstracted the network and the access methodology from the services available on that network. Initially, users connected to the Internet using telephone lines and data links. The increase in demand for Internet services led to an increase in the number of Internet Service

Providers offering information aggregation, e-mail, and other online services. This was the beginning of companies such as America Online (AOL), Yahoo and other similar service providers. These ISP's then looked to firms such as UUNET and telecommunication companies to provide high-speed backbones to facilitate the transfer of large amounts of data between networks. Each ISP pays an access and usage fee to the backbone provider and then passes these onto the consumer plus a revenue margin.

As broadband connectivity became cheaper, consumers adopted the new connectivity method and purchased a high-speed connection from either a telecommunications or a cable company. Regardless of the actual access method chosen, the services remained abstracted from the network access that facilitated it. In essence, one could use any Internet Service Provider, using any access method, using any device connected to any network to connect to the Internet. As shown in Figure 5 below, this model removes the linkage between the access to the network and the services that are accessible from that network. Furthermore, it shows that the revenues are now split between access and network providers, device manufacturers and service providers. This unbundling of the delivery platform from the services available on that platform is a significant shift owing to the fact that the network is now simply a conduit for a multitude of services rather than an enabler of a specific set of services.

Figure 5: The Internet revenue model



2.2.1.1.4 Vendor driven Innovation and R&D

As adoption of a single IP-based networking paradigm increased so did the number of networking equipment manufacturers, industry standards organizations and Research and Development bodies that coalesced around it and sought to further its development. Almost all R&D in the networking field is based on the assumption that wired and wireless networks and end-devices are IP-based. The following sections, describe key developments occurring in the access and network technology fields.

2.2.1.1.5 Broadband Wireless technologies

Some of the most significant work being done in this area is the IEEE 802.x series of protocols that define wireless communication standards (referred to as Wireless Fidelity or more commonly Wi-Fi) for IP-based networks. Figure 6 shows

the various working standards that equipment manufacturers and other industry participants have published. As noted in Figure 6, these standards define interoperability, technical and functional characteristics that allow end-device and equipment manufacturers and network providers to build solutions and applications around.

Figure 6: Wireless networking standards³

THERE ARE CURRENTLY 5 IEEE 802 WIRELESS COMMUNICATION WORKING GROUPS, 3 OF WHICH HAVE PRODUCED MATURE STANDARDS

 Mature standards

IEEE 802 wireless communication working groups				
Personal area network	Wireless LANs	Wireless broadband access	Mobile broadband wireless access	Wireless regional area networks
802.15.1 "Bluetooth" <ul style="list-style-type: none"> • Data rate 1 Mbps • Nominal range ~ 10 m • Limited mobility support 	802.11 "Wi-Fi" <ul style="list-style-type: none"> • Data rates up to 54 Mbps • Range ~ 100 m • Limited mobility support 	802.16 "WiMAX" <ul style="list-style-type: none"> • Line-of-Sight and non-Line-of-Sight propagation up to 134 Mbps • Mobility extension 802.16a recently agreed 	802.20 "Mobile-Fi" <ul style="list-style-type: none"> • Still in early stages** • Peak data rates >1 Mbps • Licensed bands below 3.5 GHz • Mobility up to 250 km/h 	802.22 <ul style="list-style-type: none"> • Use of free TV channels in VHF/UHF bands (54 - 862 MHz) • Fixed point-to-multipoint wireless regional networks

* Names of associated industry alliances supporting standards - who specify protocols also beyond 802.x scope

** Kyocera iBurst technology accepted as initial technical specification "BEST-WiNE" in Jan. 2006

Sources: IEEE 802 website, 802 standards documents

³ Source: McKinsey and Company. *Emerging wireless data standards*. [online] www.mckinseyandco.com (cited July 20, 2006)

Most notable among these are the Wireless broadband access (802.16) and the Mobile broadband access (802.20) standards which define both new access methodologies and core networking standards.

Wireless Broadband Access or WIMAX provides users a wireless broadband connection with connection speeds up to 134 Mbps. This is faster than currently available consumer broadband access speeds. This technology also allows single towers to service a campus or a small town or multiple towers to service a large city. Mobile-Fi extends this capability further by allowing users to seamlessly hop between different wireless nodes, in effect, duplicating cellular capabilities on a wireless, broadband IP network.

2.2.1.1.6 Alternative access technologies

Other developments that bear watching include **Broadband over Power Lines** (BPL), which is a technology that facilitates broadband Internet access through ordinary power lines. A computer (or any other device) would need only to plug a BPL "modem" into any outlet in an equipped building to have high-speed Internet access.

BPL offers obvious benefits over regular cable or DSL connections: the extensive infrastructure already available would potentially allow more people in more locations to have access to the Internet. Also, such ubiquitous availability would make it much easier for other electronics, such as televisions or sound systems, to hook up. However, variations in the physical characteristics of the electricity network and the current lack of IEEE standards mean that provisioning of the service is far from being a standard, repeatable process and the amount

of bandwidth a BPL system can provide compared to cable and wireless is in question. Nonetheless, this technology can be expected to receive much more attention from vendors seeking to profit from it.

2.2.1.1.7 Fixed access technologies

Physical and electromechanical characteristics of different infrastructure technologies define certain parameters that determine the service delivery capabilities of various networks. For instance, as shown in telecom-based access methods have different characteristics from cable-based access methods.

Table 1: ADSL vs. Cable

Characteristic	ADSL	Cable	Implications
Availability	Limited to 3 or 4 kilometers from CO	No distance limitations	Higher reach for cable based networks
Speed	Up to 3 Mbps downstream. Speed also impacted by distance from CO	Up to 30 Mbps downstream. This is a technical limit but usually capped to a lower speed in practice.	Higher innate bandwidth capability means that more services can be delivered via existing infrastructure
Topology	Dedicated connection to end-user	Shared connection for end-users, commonly a neighborhood.	Cable modems can become congested and perform slower during peak hours

The developments in this area have focused primarily on increasing throughput for ADSL based networks in the form of ADSL 2 which will allow download speeds of up to 15 Mbps, ADSL bonding which will support "bonding" two ADSL 2 connections together to allow 30 Mbps download speeds and VDSL which will allow download speeds of 50 Mbps.

Other infrastructural developments in this area include the various FTx, where "x" stands for home, neighborhood, curb or node, series of technologies that will offer even greater download speeds. Similarly Gigabit Optical Networking or GPON will allow download speeds of up to 2.4 gbps and upload speeds of up to 1.3 gbps.

2.2.1.2 Conclusion

The long-term implications of WIMAX, Mobile-Fi and BPL are complex and hard to quantify given that these innovations are still to be brought to the mass market. Computer chip makers already embed support for the 802.11 wireless LAN standards in their laptop computer chip products. PDAs, phones and cars also support the "Bluetooth" series of standards. Cellular phone manufacturers are also now selling "dual-mode" devices thereby allowing users to switch between a traditional cellular network and a broadband wireless network.

What is clear is that new network architectures are changing the economics of networking and service delivery not just for telecommunication firms but anyone seeking to provide network services. Wireless standards are making it easier, cheaper and simpler to provide connectivity. Similarly, the ability of end-devices, applications and services to exploit the capabilities of the new networks are increasing to the point that all IP-based and standards compliant networks become enablers and relatively equal in terms of functionality.

Also clear is the fact that vendors and manufacturers are leading the development of standards and functional roadmaps of this converged IP platform not the telecommunications carriers and other network operators. A case in point is the development of the IMS set of standards and equipment that promises to converge both traditional wireline and wireless functionality as well as the next generation of services and functionality into a hybrid network that

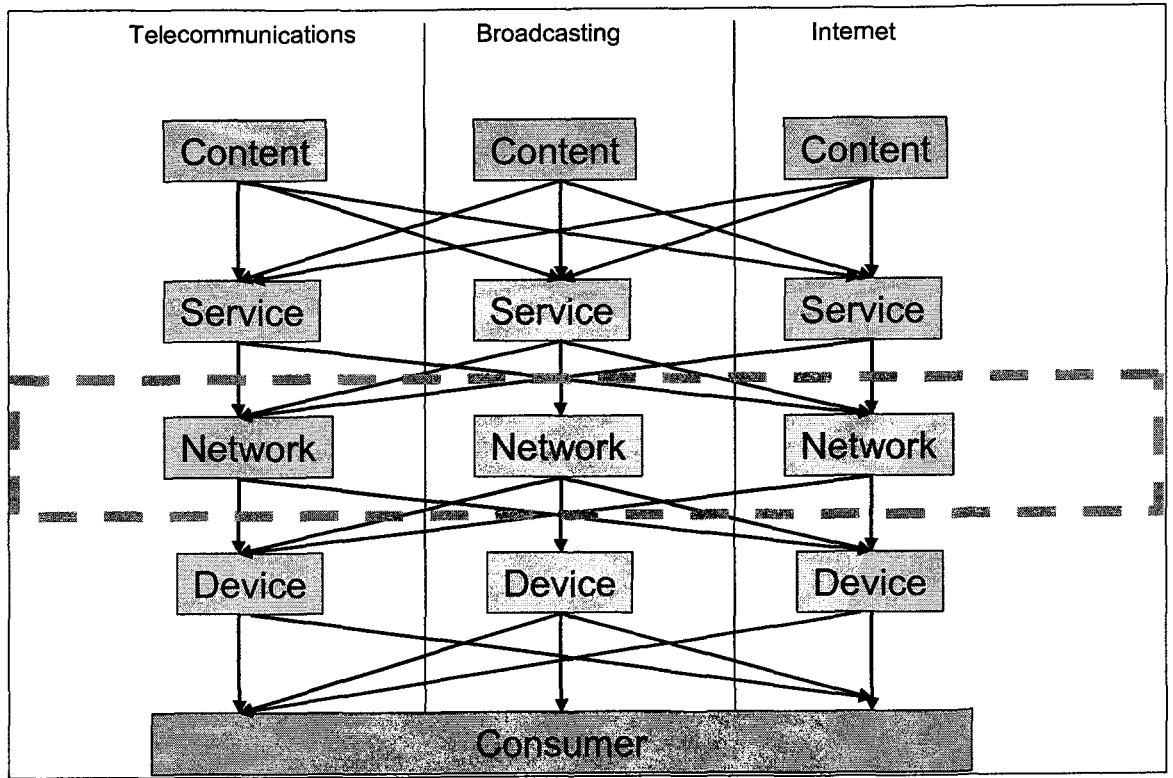
essentially fuses both the IP-based paradigm as well as the traditional circuit-switched networks.

These set of standards at first glance offer operators the ability to deliver new services and functionality but also make networks homogeneous and readily commoditized. Furthermore, given the large customer base and legacy infrastructure that it currently maintains and manages, how quickly and how profitable will it be for telecommunications operators to migrate to the new architectures? In this respect, new entrants, specifically those in areas where telecom infrastructure is less mature and where large population densities will support alternative carriers, have an advantage over incumbents in deploying new network architectures and capabilities.

2.2.2 The unbundled platform

The IP network is a boundaryless network in that all nodes are able to communicate with other nodes regardless of their location. For this reason, it is a much simpler, more flexible and more efficient way to carry data. Indeed, IP has become the platform of choice for new telecommunication networks. TELUS recently completed an all IP network that supports delivery of all data through a single, flexible and simpler network. As shown in Figure 7 below, this paradigm allows providers to use an IP-based network that can deliver any content to any device thereby supporting the delivery of voice, video and data (the so called "triple-play") to a multitude of devices.

Figure 7: The Unbundled platform

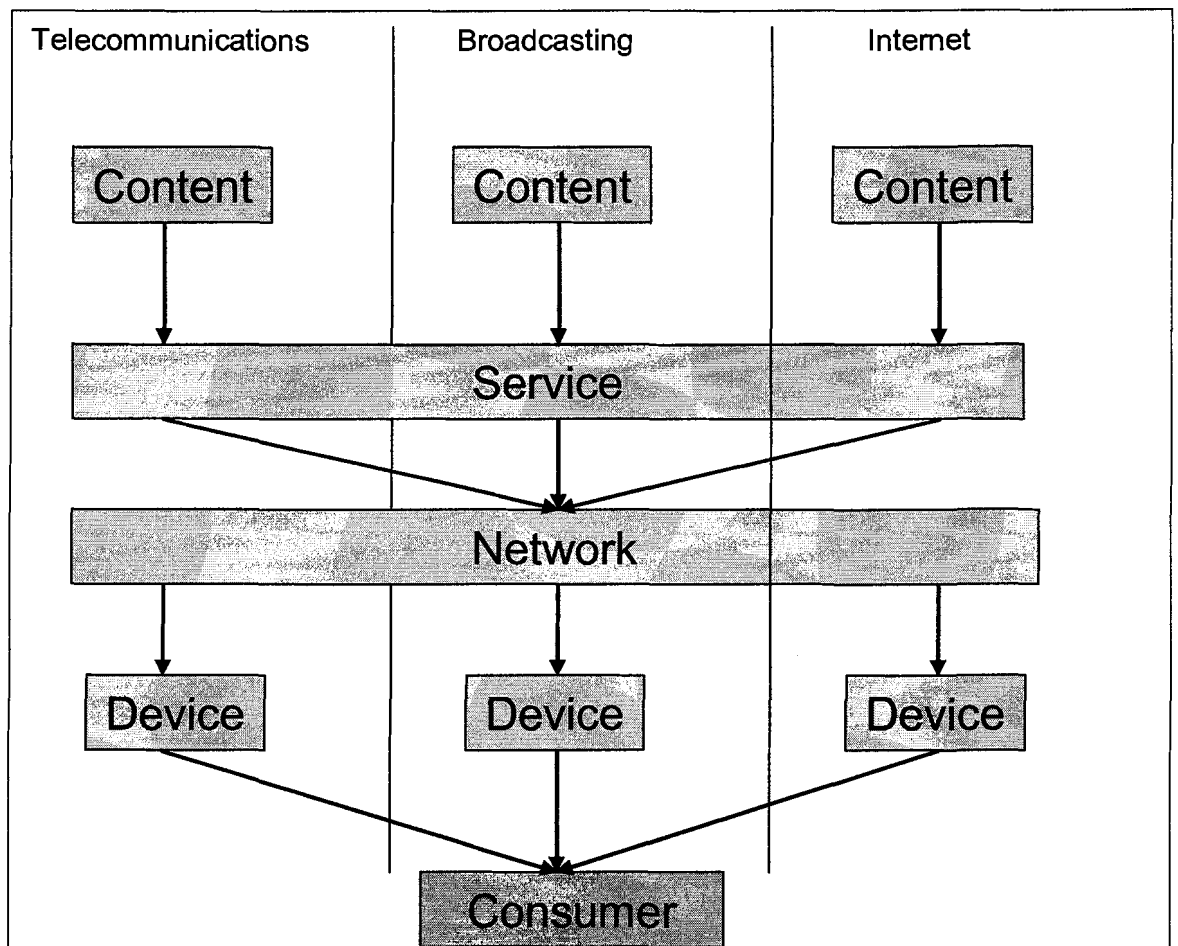


Source: Adapted from "Business role model for Broadband access". T.Monath et al, Dec 2004

Globally, vast IP networks are being created to support Internet-style applications accessible from anywhere. Voice is indeed only one of the applications and services which these networks can carry. While this 'hype' often obscures the fact that the vast majority of telephony, radio, and television is still provided using conventional telephone, radio, and television networks, and will continue to be so for several years, there is a very strong trend towards an "IP in everything and everything on IP" world given the expected costs savings and opportunities for differentiation.

The "all-IP" paradigm has significant implications for operators. Assuming that operators slowly converge to similar IP-based networks, the long term implication is that there will be less differentiation between them. An IP-based network provider can accommodate all services and deliver to all IP-based devices. As shown in Figure 8, the impact of this shift to a common, open IP-based model is the stratification of the communications delivery chain to a network layer and a services layer. In this model, telecommunications firms (and cable firms) owing to their common networks begin to act as "pipe" providers for various content producers and service providers. Service providers will own the distribution and content rights while network providers own the network access and connectivity or the so called "last mile". In some cases, even this element will come under competition from alternative access providers using new wireless technologies to offer cheaper access and connectivity.

Figure 8: The 2 layer platform



2.3 The new business model

The true power of disruptive innovation is its ability to support radically new business models. Well known examples include Amazon, Dell and eBay. These firms took existing products and services to market using different business models. Their cost structures, practices and processes are such that they were able to not only carve out a niche but were eventually able to challenge incumbents.

Similarly, the challenge to the telecom industry lies in the business model that the new entrants have developed. Although they have succeeded in bringing new technologies to some parts of the network, most of their investment has been in deploying software and new transmission technologies, a relatively cheap component of the overall infrastructure.

Regulation (and in some respects its absence) has encouraged this entry, and has supported innovative business models and new investments in competitive transmission infrastructure or IP-telephony-based software and customer premise equipment.

Other firms use innovation to create entirely new categories of businesses. Google practically founded the search industry and mastered the use of keyword search to generate advertising revenue. Like other disruptive innovations, they began as a niche product and eventually became the dominant firm in its industry. This section will provide a brief summary of key industries and firms that are either already or potentially will be offering competitive products and services.

2.3.1 Alternative Access providers

2.3.1.1 Cable companies

Cable companies are entering the phone business using IP-telephony based phone-to-phone services. This service most closely approximates the traditional telephone experience and can display very good or very poor quality, depending on the nature of the network or networks over which packets

are carried. In this model, users connect their existing phone sets to an adapter that transmits voice calls over an Internet connection rather than a telephone network.

Initially, EastLink, a privately-held cable operator servicing Nova Scotia and Prince Edward Island, entered the voice market with a circuit-switched voice solution. Even without the economics and inherent flexibility of VoIP, the company has achieved over 30 percent market share of the markets that it has entered.

Videotron, despite an initially restricted area of coverage, has acquired 163,000 subscribers in its first year of operation as a Multiple Services Operator (MSO). This equates to 10.8 percent of its total cable subscribers⁴. Similarly, for the third quarter of 2006, Shaw Communications reported gaining 168,903 total digital phone subscribers since service inception generating over 2.7 million calls within their private network⁵.

While the Internet can certainly be used as the underlying means of transmission, cable companies use a closed, managed IP network as the underlying platform to sell their "digital phone" services as a bundled product along with their high-speed Internet connection and cable packages. In all cases these companies enter into formal billing relationships among gateways

⁴ Gartner Research, "Top three issues facing Canadian carriers today" Document Number: G001374006. February 8, 2006. page 2.

⁵ News Release: "Shaw increases guidance based on positive financial results". June 30, 2006. Shaw Communications Inc.

and incumbent carriers and interconnect with the PSTN in a similar way as illustrated in Figure 2.

In this respect, cable companies' Phone-to-Phone VoIP services have very little to do with the public Internet, but rather operate nearly in parallel to the global PSTN and its settlement rate system. Similarly, their business models rely on toll and access revenue like the incumbent telecom firms. These companies however feature cheaper monthly access charges and also cheaper toll rates, usually through a flat-rate pricing scheme. These firms also provide interconnect revenue to telecom firms given that they need to connect to and from telecom network devices.

Cable companies pose the most serious near-term threat to telecom firms given that the physical capabilities of their infrastructure are able to better support the video, data and telecommunications "triple play" that allows them to offer bundling and one-stop shop services. In response, companies like TELUS introduced TELUS TV and are also planning to roll-out consumer VoIP services that seeks to provide consumers with their equivalent "triple-play" products capability.

2.3.2 Device and application providers

2.3.2.1 Vonage

Vonage sells adapters that allow users to connect their existing phones to the public Internet instead of a closed, managed network and charge users a monthly access and flat-rate calling pricing structure. As of March 2006, Vonage

reported over 1.5 million subscriptions and generated revenues over \$269 million and a net loss of \$261 million based on average monthly revenues of \$27.04 per subscriber in 2005⁶.

Similar to cable companies, Vonage enters into formal billing relationships among gateways and incumbent carriers. The key difference between this business model and that of cable companies and telecommunications firms is that Vonage does not own nor manage a comprehensive end-to-end infrastructure network. For access, it relies on the users existing access whether it be a DSL or cable connection. It also relies on the various backbone providers to haul traffic to end-offices and PSTN gateways. In 2005, Vonage reported the average monthly cost of providing telephony service per line is \$8.44⁷.

2.3.2.2 Skype

Skype provides a free peer-to-peer based communication software that allows anyone with a broadband Internet connection to make free voice over internet protocol (VoIP) calls to any other Skype user. In this respect, Skype is similar to other VoIP application providers such as it is no different from a pure Voice-over-IP company. Skype however, allows Skype users to place cheap calls to any traditional phone in the world or the other way around via their paid service called Skype In /Skype Out.

⁶ Vonage website (www.vonage.com/corporate/). July 19, 2006. All dollar amounts are in US dollars.

⁷ Vonage website (www.vonage.com/corporate/). July 19, 2006. All dollar amounts are in US dollars.

EBay recently acquired Skype for \$2.6 billion. The rationale of this acquisition seems to be that a free communications application like Skype, would increase the conversion rate (the percentage of Web site visits that result in the purchase of an item) and reduce the length of time required to bring each transaction to a final sale. Whether this business case holds or not remains to be seen, it is clear however that Skype now has the resources to further develop its application and increase its market penetration.

As a private firm which was then purchased by eBay, Skype had not provided official subscription and revenue numbers. However, Gartner Research reports that as of "December 2005, Skype had in excess of 218 million software downloads worldwide, and the number of Skype concurrent users grew to 4 million, with more than 35 million minutes of use per day. In August 2005, Sandvine, a company that monitors broadband networks, stated that Skype accounted for more than 35 percent of VoIP calls and more than 45 percent of VoIP minutes in the United States. Skype's revenue, which is primarily derived from connecting Skype users to the public switched telephone network (PSTN), has grown rapidly from \$7 million in 2004 to an estimated \$60 million in 2005.⁸"

2.3.3 Services and Content providers

2.3.3.1 Google

Google's launch of Google Talk heralds its entrance into both the instant messaging and voice over IP (VoIP) and chat markets. Google uses a unified

⁸ Gartner Research, "Skype makes significant contribution to the changing voice market" Document Number: G00136968. January 26, 2006. page 2.

communications application that provides users a single, intuitive and user-friendly interface for managing all their communications. Google and other companies such as Microsoft and Yahoo provide free voice calling to other users of the same unified communications application. Devices are widely available now that allow users to connect a phone like device to their computers to more closely resemble the telephone experience.

Unlike Yahoo and, for now, Microsoft, Google however has also proposed the provision of free wireless high-speed Internet access in San Francisco, a service that could potentially enable users to make free voice calls via VoIP. This service, based on WIMAX technology, would allow users to bypass the local connections of cable and local telephone companies, thereby circumventing access fees.

Unlike traditional telecommunications providers, Google is not concerned with jeopardizing its traditional revenue sources by offering a free communications service. Industry experts and literature document the fact that Google has been making significant investments in network infrastructure (Gartner Research, 2006). Its free wireless service would be carried over a network that it would build and operate with partners that could be either telecom firms, cable companies, ISP's, VNO's or other alternative providers. It is also considering wholesaling wireless bandwidth on the network, creating yet another new source of revenue. Google has also purchased a large amount of dark fiber and has begun construction of its own network. Google will use this network to carry traffic between its data centers, but it could also be used to

transport data from its free wireless service, for video distribution or for other forms of on demand content. Google has also recently invested in Current Communications, a broadband-over-powerline (BPL) service provider, underscoring its interest in the transport market. By 2010, Google could potentially be one of the largest global buyers of off-Net voice minutes and one of the largest buyers of fiber connectivity in the world.

If Google launches Wi-Fi services on its own network, it would then have infrastructure costs to absorb, but Google is also well-positioned to use a communications infrastructure as a springboard to launch new Google services, allowing these value-added services to subsidize the operation of the free basic communications.

2.3.3.2 Microsoft

Microsoft's drive into telephony services is an extension of its strategy to own the end-user computing experience whether that's on a PC, PDA, TV, or phone. The company has telephony initiatives in each of its three business divisions. In some cases, telephony and VoIP access is being added to existing products, while in others these initiatives represent new products. Microsoft looks to augment the value of their software and related applications by managing and controlling access to information and communication and integrating it into a broader set of applications they sell.

In recent years, Microsoft has actively sought to penetrate the telecommunications and broadcasting industries with products intended to facilitate management, provisioning and distribution of content, network and

service elements within the telecom/cable company infrastructure. As such it seeks to enter the OSS/BSS arena by offering software that enables and facilitates service provisioning and management. In July 2006, Microsoft entered into a 4-year partnership with telecommunications equipment manufacturer, Nortel Networks to co-market Unified Communications applications aimed at the enterprise market. In this scenario, Nortel would probably produce network equipment while Microsoft would produce the software, applications and services tie-ins. Microsoft is also developing ways to integrate "mobile-fi" technology into their products. This would allow Microsoft to differentiate their offerings by allowing users to remain connected as they move from one Wi-Fi access node to another. By combining this ability with VoIP applications that their applications already offer, this would essentially make their applications act like mobile phones.

In the near-term Microsoft certainly looks to enter the telecommunications industry as a supplier and enable of next-generation services and communications functionality. In the longer term, as it continues to build capabilities and skillsets in the telecommunications arena, it is plausible that Microsoft may decide to enter the market as a telecommunications service provider perhaps in partnership with or through acquisition of a network operator in selected markets.

2.3.3.3 Internet Service Providers

ISP's are well positioned to provide telecommunication services as a bundled offering with their Internet services. These ISP's could also leverage wireless connectivity alternatives.

2.3.4 The Virtual Network Operator (VNO)

A VNO is essentially a wholesale sourcing, sales and marketing entity. VNO's have none of the worry about investing in the technical infrastructure. They have carriers lining up to sell them unused bandwidth, are usually nimble and very price competitive. Of course, the downside is that they don't have control over their infrastructure. This makes them highly dependent on their infrastructure providers for technical currency and, more importantly, for the quality of service and support.

What VNO's do have is the ability to focus efforts on selective markets. Some VNO's, such as Vanco focus exclusively on Multinational Corporations (MNC's) while others such as Virgin Mobile operate as a Mobile VNO or MVNO with a focus on the younger demographic of cellular users.

Another type of VNO is the municipal network provider or the so-called *muni-net*. These entities essentially argue that Internet access is an "essential service" much like water and electricity and therefore seek to offer basic connectivity as part of the bundle of taxpayer funded services offered by the municipality. These *muni-nets* seek to partner with network providers to offer basic access to residents within a geographic area and presumably will also

seek to charge users for value-added services such as extra-high-speed for streaming and real-time applications such as VoIP.

2.4 Key implications of disruptive business models

Despite the arrival of new entrants and the erosion of prices, the telecom industry has remained profitable, and continues to earn more than its cost of capital. However, much of this profitability derives from a revenue model that still relies heavily on selling voice minutes, even though a large share of costs is actually fixed, moreover, the new business models being introduced into the industry are significantly impacting broader aspects of the industry.

2.4.1 Changing nature of demand

This discrepancy between the industry's revenue model and its underlying costs creates opportunities for arbitrage. Some entrants—the service-based rather than infrastructure-based competitors—are increasingly exploiting these opportunities. They are aided in large part by regulation and by technological changes that have made Internet standards and IP networks ubiquitous, with their relatively low cost for carrying voice (and data) traffic. This in turn is changing the nature of demand, as consumers and businesses look for simpler, cheaper solutions based on a single piece of easy-to-use equipment, and a simpler, cheaper pricing scheme, usually flat-rate plans or very low-cost calling. Though these changes have been under way for some time, they seem finally to be gathering steam as the forces of technology, regulation, and demand converge.

Both mobile and fixed networks are being affected, but the erosion is far more marked in fixed telephony, simply because the process of regulatory opening has been more thorough and onerous, and has had longer to run its course. The net effect, if not addressed, could be to reduce both average and marginal rates of return on infrastructure, with unknown consequences for future investments.

2.4.2 Changing the customer base

A disruptive innovation does not need to be necessarily better than the technology that it eventually displaces; it need only be good enough to meet the majority of user's requirements (Christensen 1997). This is certainly the case for VoIP, IP-Telephony and Unified messaging applications, however, the mass adoption of VoIP and other converged communications tools have been hampered by several key factors:

1. Quality of service issues leading to an inconsistent user experience.
This is specifically related to services that use that use the public Internet such as Skype, Vonage, MSN and Google.
2. Consumer concerns about ability to access enhanced and emergency services such as 911 and 411.
3. Low marginal benefits given that long-distance tolls and access charges are already at historically low levels.

It is reasonable to accept, given that significant resources are focusing on how to make IP-telephony and VoIP a true alternative to the PSTN, that the first

two issues will be addressed in time. Companies such as Vonage and Shaw Communications are already offering communications services that include 911, Message Relay service and Directory Assistance services. As this functionality becomes available on other communication options it will lead to more users adopting VoIP and IP-Telephony based applications as true alternatives to telecommunications services.

The third issue however poses an interesting issue for both incumbents and entrants. In a recent decision on VoIP regulation, the CRTC noted that “facilities-based competition in local services has been in place in Canada for nearly eight years and yet, as of the end of 2003, the ILECs accounted for 98 percent of local residential revenues and 92 percent of local business revenues across the country. The Commission also notes that even in the long distance service market, which has been fully competitive for thirteen years, only 41 percent of residential subscribers have tried a long distance provider other than an ILEC. In the Commission's experience, customers of local exchange service are very reluctant to change local service providers. This inertia – particularly with respect to residential customers – has proven to be a significant hurdle for competitors.”⁹

Clearly, the CRTC believes that consumers will exhibit similar behaviour when assessing VoIP and other communication options. However, this “inertia” is less about customer loyalty or apathy but rather that prices have been falling for both entrants and incumbents. Furthermore, this perspective does not address the fact that not all customers are equal. In the telecommunications business,

⁹ Telecom Decision CRTC 2005-28, paragraph 131.

the familiar 80-20 rule still applies in that a small segment of consumers (high-value customers) generate all the gross profit, which underwrites the remainder of the customer base that is unprofitable.

This rule is evident in any industry providing universal services and where rate increases to cover the higher cost of service is not permitted. The banking community found itself in a similar environment but reduced its impact by a breadth of add-on charges. The telecommunications companies similarly have introduced value-added services (for example, call waiting, call privacy, voice mail and so on) that generate the profit needed to underwrite and overcome uneconomic "carrier of last resort" obligations.

Within individual telecommunications companies, the percentage of high-value customers is higher than 20 percent; however, the overall impact is the same. A percentage of the carrier consumer base provides the profitability of this market. If an ILEC loses 5 percent or 10 percent of its market share and this is part of the 20 percent high-value customers, the impact can be extremely significant, if not catastrophic. There are regions in the United States where new entrants have achieved telecom market share as high as 30 percent of homes passed. Cox and AT&T Broadband in specific U.S. markets and EastLink Communications in Canada are examples.

As these users migrate to alternative providers and services, the makeup of customers will slowly begin to change. More of the telecommunications carriers customers will be the least price sensitive service, least demanding customers who put the least value in alternatives given that they don't use

communications services a lot. These are the very late majority adopters who don't see value in moving to any technology given that existing technologies work and that they have very little demand for new functionality. These users typically don't spend a lot. This will make it difficult for telecom providers to generate additional revenue which will make it difficult to spend on infrastructure and other upgrades. An extreme case of this scenario is that telecommunication firms will carry the burden of supporting a smaller population of lower value customers unwilling to spend more money on communications services. This would create a scenario where revenue from users will slowly begin to erode to the point that continued investment in network infrastructure will also begin to be threatened.

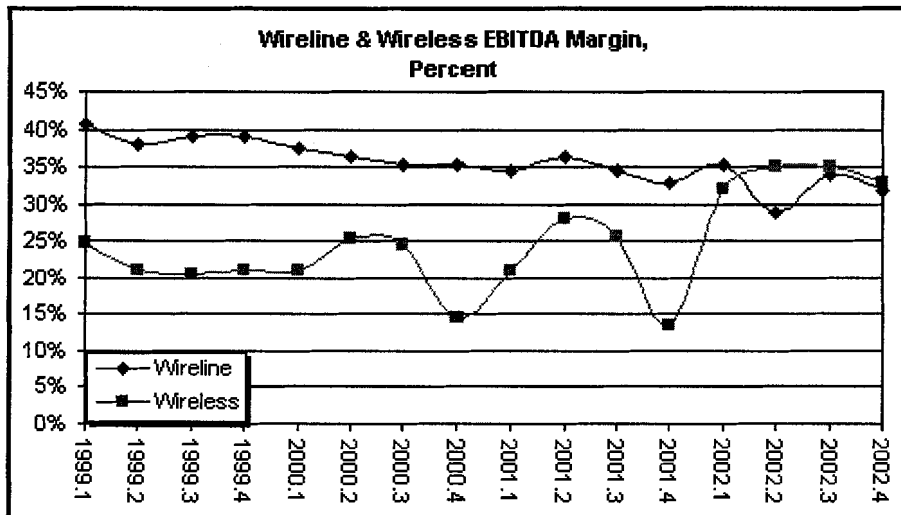
2.4.3 Lowering expected margins

Providing telecommunications the "old-fashioned" way is a very profitable business. Once the PSTN infrastructure is in place, the incremental costs associated with providing the services are extremely small compared to the revenue generated over the lifetime of the customer. Traditionally, telecom firms have enjoyed over 40 percent EBITDA margins on both access and toll services.

Even wireless products don't generate the same margin per user as wireline users. Figure 9 shows EBITDA margins for both wireless and wireline for the Canadian telecommunications industry from 1999 to 2002. It shows that wireless EBITDA margins began from 25 percent and have steadily approached and, in 2002, began to approximate that of wireline. However, as shown in Figure 10, for the same period, wireless subscriber growth has outpaced that of wireline by

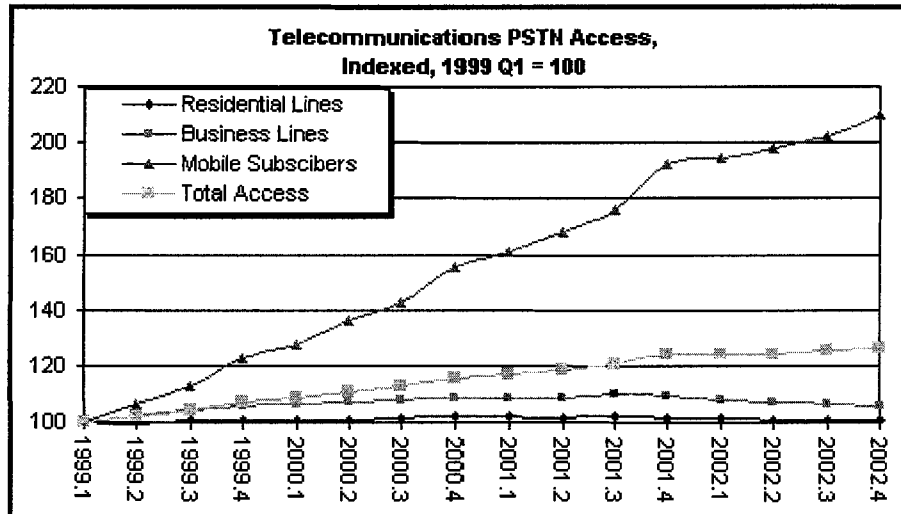
almost a 2:1 margin, demonstrating that for each incremental wireless user added, it takes almost two wireless customers per each wireline customer to generate the same EBITDA margin.

Figure 9: EBITDA percent comparison wireless and wireline¹⁰



¹⁰ Source: Industry Canada. Quarterly monitor of Telecommunications Services. www.strategis.ic.gc.ca

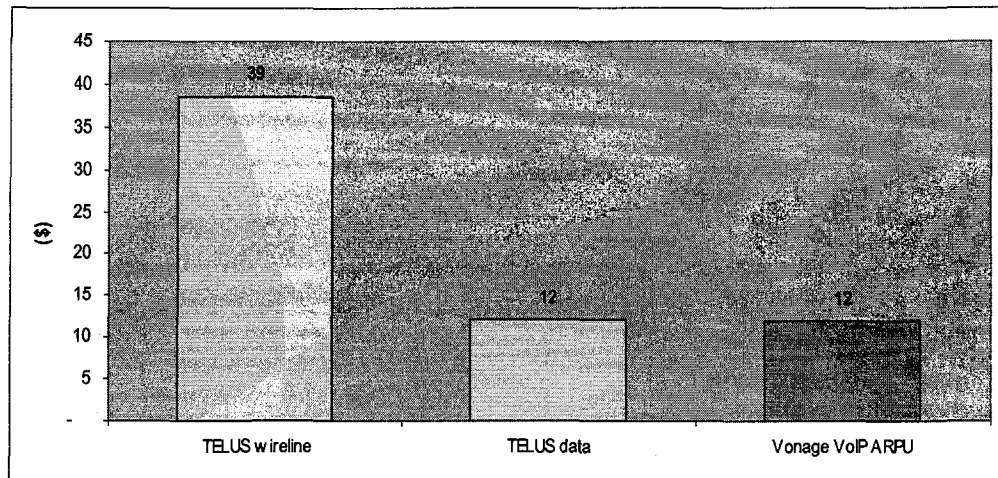
Figure 10: Subscriber growth index¹¹



The new services and applications that new entrants will be introducing to the market will feature even lower margins. Figure 11 compares the revenue per access line of TELUS wireline and data products compared to the ARPU as provided by Vonage in their 2006 quarterly reports. What it shows is the marked difference in ARPU from TELUS wireline products and that of Vonage. Particularly interesting is that Vonage's ARPU is much closer to TELUS' data products than it is to its voice products.

¹¹ Source: Industry Canada. Quarterly monitor of Telecommunications Services. www.strategis.ic.gc.ca

Figure 11: TELUS Wireline and Data revenue per access line and Vonage ARPU¹²



Over time, this trend towards a lower margin communications industry will begin to impact the wireless segment and other communications services segments as well.

2.4.4 The disruption time frame

At a high-level, the disruptive innovations entering the industry can be classified into near, medium and long term horizon.

The near term threat is the alternative network provider that seeks to leverage IP-Telephony and VoIP as a complement to their existing offerings. In this category are cable companies and to a smaller degree ISP's that seek to benefit from the price arbitrage given the lower costs and efficiencies afforded by an IP-based network.

¹² Vonage ARPU based on Q2, 2006, 2nd quarterly report data. www.vonage.com. TELUS access line and revenues based on 2005 Annual report, segmented operations data. www.telus.com.

The medium term threats are the services, content and application providers that seek to relegate telecom firms to being "pipe providers" by providing free telecommunications capabilities in ways that supports their value-added and content-driven revenue models. Google's market cap is \$117 Billion, Microsoft is \$223 Billion, and eBay is \$48 Billion. These firms don't seek to use voice calling as a form of revenue stream and worst for the telecommunications firms is that Microsoft and Google have both the resources and scale to make a large-scale and long-term foray into the telecom market. Also in this medium term horizon are the alternative network providers that seek to deploy new, cheaper and more flexible networks that facilitate telecommunications in select areas.

The longer term implications come from the fact that as the network becomes further abstracted from the applications using them and as network providers begin to converge to a common IP-based infrastructure, the service and content providers will begin to reach through the network and take ownership of the customer. In essence the customer would choose from a variety of network and access providers but would be "loyal" to a specific communications services provider. Furthermore, Microsoft, Google, eBay can enter the network operator arena by becoming a VNO or select a VNO to manage their network operations.

An example of this would be a young man who enjoys playing video games on Microsoft's Xbox video game console, who, by subscribing to a Microsoft communications package, also gets discounts on video games, game downloads and other Microsoft products. This person enjoys having the same

communications user interface whether he is using a cellular phone, his laptop or his TV. Given that his address books and messages are all on-line he is able to use it from anywhere and from any device. His telecommunications would be almost free given that calling other Microsoft subscribers would, of course, be free while calling North-American or International numbers would be at a flat-fee.

Furthermore, assuming that the access methodology hasn't already been supplied by his municipality, this young man will have to decide to purchase connectivity from a variety of providers (telecom, wireless, cable, ISP's or even the electricity company). Depending on where this person lives, Microsoft may be one of those access providers and would, of course, get a discount on bundling his access with his services. Clearly, in this scenario, the real value lies in owning the customer and not in owning the network.

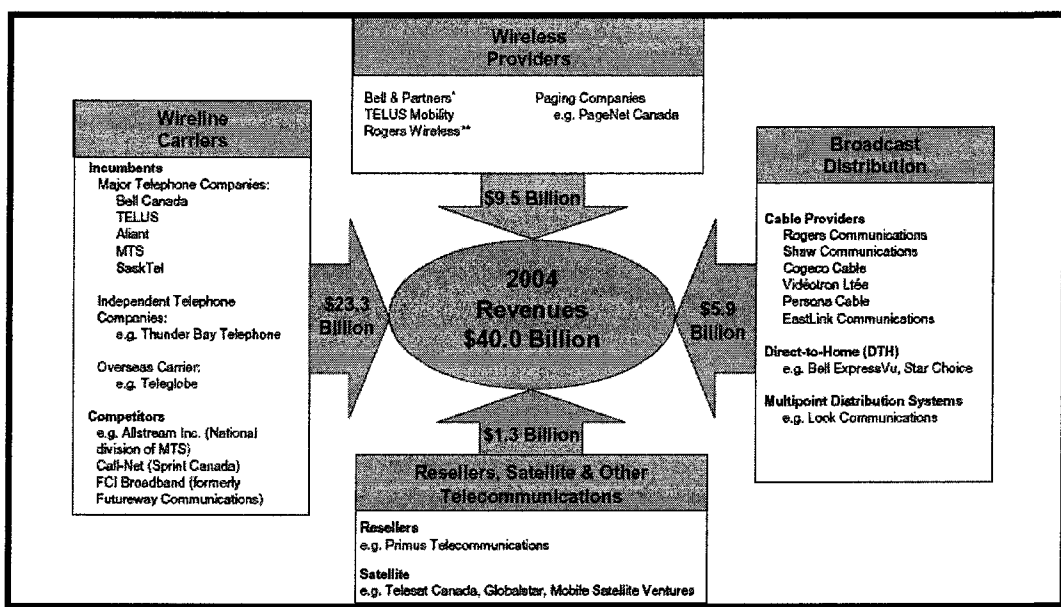
Of course, none of these events may unfold as described above or new innovations may unfold that hasten or change the trajectory of evolution in the industry. Furthermore, it is almost impossible to quantify what the timeframes actually are and if long-term means six months, six or sixteen years. How will these developments impact the telecom industry and what particular aspects would be most impacted and why? The rest of the paper will examine the Canadian telecom industry and the current competitive context in which Canadian telecommunication firms operate and examine how these disruptive innovations will impact it.

3 INDUSTRY ANALYSIS

3.1 Industry Overview

Figure 12 illustrates the Canadian Radio-Telecommunications Commissions (CRTC) definition of the Communications industry in Canada. Detailed information on each segment discussed below is available in **Appendix A: CRTC Market Participant Definition**.

Figure 12: Canadian Communications Industry Overview



Source: Stats Canada

The **Wireline Carrier** segment accounts for approximately 58 percent of communications service industries revenue. This segment includes both incumbent carriers and competitive service providers. The **Wireline Incumbent**

Carrier segment accounts for approximately 52 percent of total communications service revenues¹³.

Wireline Competitive Service Providers are comprised of Alternative Providers of Long Distance Services (ALPDS) and Competitive Local Exchange Carriers (CLEC's). This group accounts for approximately 5.9 percent of the market.¹⁴

Wireless Service Providers generated approximately 24 percent of the communications service market.¹⁵

Broadcast Distribution segment generated approximately 15 percent of the total communications service market.

The **Resellers, Satellite and Other Telecommunications Services** segment represents the smallest segment with a share of the total revenue of approximately 3.3 percent. Most of these revenues came from the telecommunications resellers, such as Primus Telecommunications, of which there are now 556 operators registered with the Canadian Radio-television and Telecommunications Commission (CRTC). The satellite service market includes Telesat Canada, Globalstar Canada and Mobile Satellite Ventures¹⁶.

¹³ Telecommunications Service in Canada: An Industry Overview 2004

¹⁴ Telecommunications Service in Canada: An Industry Overview 2004

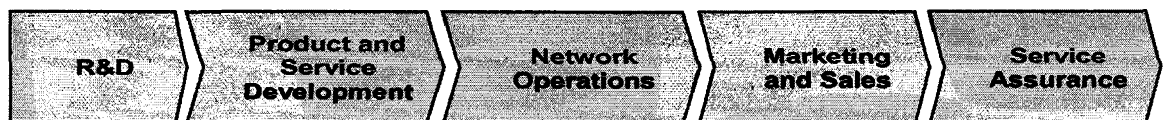
¹⁵ Telecommunications Service in Canada: An Industry Overview 2004

¹⁶ Source: Statistics Canada, Survey of Telecommunications Service Providers (April 2005) and CRTC, Broadcast Distribution Statistical and Financial Summaries (June 2005).

3.2 Value Chain

Figure 13 illustrates the key components of the Telecom Industry value chain. The following sections will provide a generic, industry-level description of each activity and how each contributes to margin creation.

Figure 13: Industry level Value Chain



3.2.1 Research and Development (R&D)

Research and Development in the Telecom Industry is usually performed by equipment manufacturers, software vendors and various scientific and engineering groups. R&D is important to the industry because telecom is a highly technical industry and relies on technological improvements to drive increased capabilities and efficiencies. The primary activities involved in R&D are:

3.2.1.1 Technical Standards and definitions

Standards are critical to ensuring that products, solutions and services are interoperable and can be maintained cost effectively. Standards are negotiated, formalized and managed by various standards bodies such as the IEEE, ITU, IMTC and others. These groups are usually comprised of equipment manufacturers, consulting and telecom firms, industry and technical experts and various business, legal and corporate groups.

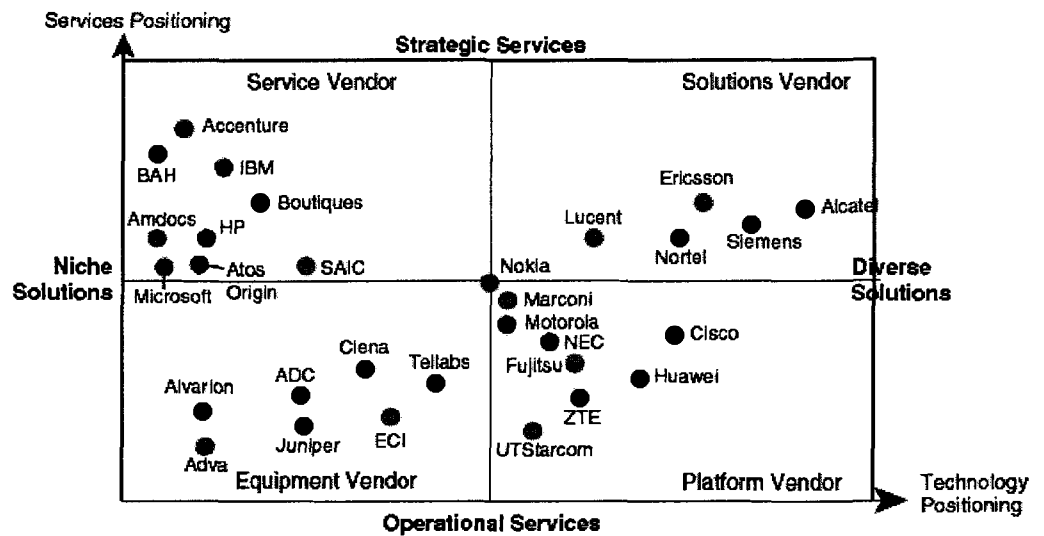
The presence of standards facilitates investment in R&D, manufacturing and application development and allows firms in this industry to manage their technology investments as efficiently as possible. Interoperability standards allow handsets to work seamlessly across multiple carrier networks carriers (roaming). Without these standards, wireless handsets would be useless outside their network providers' service area and would severely impact both adoption and revenue generation.

3.2.1.2 Market Research

Market research activities within the telecom industry consists of market sizing and profiling, determining feature and service preferences, investigating potential applications for existing technologies and anticipating new applications for technologies and assessing potential revenue impacts of these factors. These activities are typically done by vendors, platform vendors and consulting firms. Additionally, telecom firms look to this group to provide new thinking and innovation to business processes given their broader global view and experience.

Figure 14 shows the key vendors involved in the Telecommunications industry globally.

Figure 14: Telecommunication vendors and market positioning



Source: Gartner Dataquest (November 2004)

3.2.1.3 Hardware and Software development

Equipment manufacturing and application development is characterized by long development cycles, large upfront investments and constant technological change. The vendors shown in Figure 14 collectively account for almost all hardware manufacturing and application development that exists in the telecom industry today. Telecom firms are highly dependent on the ability of these firms to deliver solutions and provide an infrastructure for productizing applications and services.

3.2.2 Product and Service Development

Product and Service development refers to activities performed by the telecom provider in order to introduce new services and products to the marketplace. These activities involve integrating new services to the existing telecom infrastructure, defining delivery and distribution channels and modifying

business processes to accommodate any changes required to deliver the service.

3.2.2.1 Technology Adoption

Adoption of new services and technologies is a key activity that telecom providers need in order to be able to introduce new services into the market. Certain firms are able to do this better than others and consequently are able to introduce services faster and at lower costs than others.

3.2.2.2 Business Process management

Telecom providers are large bureaucratic organizations that require significant coordination, management and alignment effort. Inability to appropriately manage and coordinate internal processes, political sensitivities, cultural differences and leadership agenda's can result in delayed or unsuccessful deployment of new products, cost-reduction initiatives and efficiency enhancements.

3.2.3 Operations

Certain telecom firms choose to lease or purchase access to telecommunications networks. In the wireline segment, these carriers are called rebillers or non-facilities based carriers and in the Wireless space they are called MVNO's¹⁷ or mobile Virtual network operators. These firms purchase wholesales minutes from facilities-based providers and resell those minutes to end-users. As

¹⁷ Virgin Mobile is an example of an MVNO. Virgin Mobile buys wholesale minutes from Bell Canada, which it then resells to the public. Its primary activities are marketing, billing and product development. It doesn't operate a network.

such their margins are based on the difference between the network provider charges and end-user receipts.

The activities listed below describe key activities of facilities-based carriers.

3.2.3.1 Network management

The core service offered by any Telecom provider is the ability to facilitate communication between end devices. For facilities-based providers, this means significant investment in the design, planning, management and maintenance of the communications network. These activities include equipment procurement, testing and integration, monitoring and maintenance.

3.2.3.2 Provisioning and Billing

Provisioning and Billing refers to activities that allow providers to provision a service and bill for it. Network services are intangible, yet highly differentiable and measurable. An example is wireless voice vs. wireless data. Both are essentially the same service but command significantly different prices in the market. Providers that don't have the infrastructure to adequately provision and bill for differentiated services risk being overtaken in the market by competitors. Others are unable to extract full value from their market given the inability to provision and accurately charge for services offered from the network.

3.2.3.3 Financial Management

Operations and Financial management refers to activities that aim to drive costs out of the organization, increase efficiencies of both scale and scope and manage cost and debt structures. Given the maturity of the telecom

industry, cost control, operations and financial management are key activities that telecom operators need to master.

3.2.4 Marketing and Sales

The telecom marketplace is extremely competitive and products are difficult to differentiate. The effectiveness by which firms market their products determine the level of differentiation the market perceives. Additionally, telecom products can also be very complex and require significant expertise to sell and implement. A firm's ability to partner with other vendors, demonstrate competence in the marketplace and sell profitably significantly impacts margins. Consequently, firms in this space have started to emphasize recurring revenues over large one-time deals.

3.2.5 Service Assurance

3.2.5.1 Network management

Telecom services are considered an essential service by most users and hence customers expect telecom providers to provide a reliable service. Any facilities-based operator spends significant time and money ensuring that network resources are dependable and highly-available.

3.2.5.2 Customer Care and Service

Customer Care and Service is a critical component of most telecom services. Advances in technology have made switching costs increasingly lower making service a key differentiator for most firms.

3.3 Competitive Overview

The telecommunications industry is a highly-competitive industry and is characterized by the following:

3.3.1 Increasing Rivalry

3.3.1.1 Homogenous Products

At the most basic level, the core service offered by any telecommunications carrier is the means for a device or user to connect to another device or user. Given this, rivalry is increased between competitors because they cannot meaningfully differentiate their core offering. Furthermore, any sustaining innovations introduced by any competitor can be easily copied creating very little opportunity to sustain differentiated offerings.

To mitigate this, rivals have focused on other dimensions of the service such as regional service delivery capabilities (Bell in the East, TELUS in the West and MTS in Central Canada), value-added activities such as better customer service and customer convenience and bundling of services to provide “one-stop shopping”.

3.3.1.2 Mature Market

Figure 15 shows that total wireline revenue shrank by 1 percent between 2002 and 2004. Faced with declining wireline revenues, firms must find other growth areas, while protecting their existing wireline revenue base. This rivalry increases significantly more for companies that have limited exposure to wireless revenue or internet services.

Figure 15: Segmented telecommunications revenues

	2002	2003	2004	<i>Growth 2003-2004</i>	<i>CAGR 2002-2004</i>
Wireline					
Long distance	6.5	5.9	5.6	-6.0%	-7.5%
Local and access	10.0	9.7	9.7	0.0%	-1.6%
Data & private line	4.5	4.5	4.4	-1.6%	-1.5%
Internet	3.3	3.7	4.2	12.9%	12.6%
Total wireline	24.4	23.8	23.9	0.2%	-1.0%
Wireless	7.1	8.0	9.5	17.6%	15.5%
Total industry	31.5	31.9	33.3	4.6%	2.9%

Source: CRTC Data Collection

Figure 16 shows that penetration rate for wireless is currently at 53.9 per 100 households. It is expected that Canada will mirror the U.S. experience and approach 65 to 70 percent penetration. At this point, the growth of the market will begin to slow causing rivalry to intensify even more as any incremental growth can only be gained from capturing share from rivals. In light of this, a firm's ability to retain customers will be a significant differentiator.

Figure 16: Canadian Penetration Rates Wireline vs. Wireless (2004)

Year	Wireline	Wireless	Wireline and/or wireless	Wireless (only)
1999	98.2	31.9	98.7	0.5
2000	97.7	41.8	98.8	1.1
2001	97.4	47.6	98.6	1.2
2002	97.0	51.6	98.7	1.7
2003	96.3	53.9	98.8	2.5

Source: Statistics Canada

Figure 16 also shows that between 2002 and 2004, CAGR for the industry was a mere 2.9 percent, which is essentially tracking GDP for the country. Particularly worrisome is the fact that this is in the midst of the significant growth of the wireless industry. This increases rivalry because firms must take market share from rivals in order to grow past this rate.

3.3.1.3 High Concentration

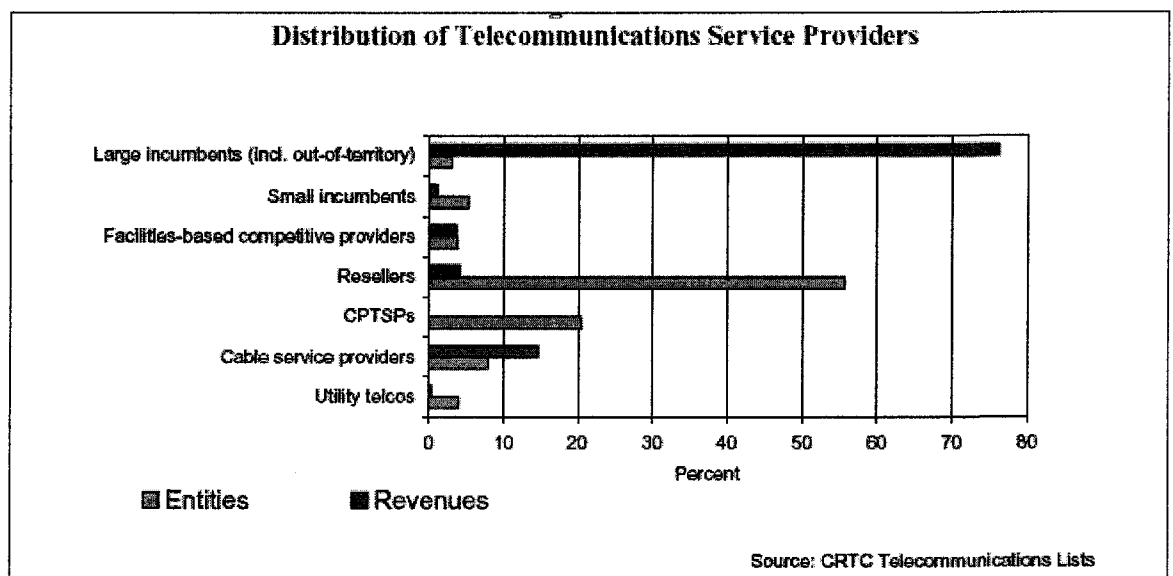
Figure 17 illustrates the fact that the top 3 ILEC's accounts for 2/3 of total revenues in the marketplace which makes for a very high concentration of players. When combined with Cable Distribution companies the top 5 firms account for greater than 90 percent of total revenues in this industry. This high concentration of firms lessens rivalry because the largest players can implicitly set market rates.

Furthermore, the largest firms have the least incentive to reprice the market and would rather buy a competitor than compete on price. A clear example of this was the recent purchase of Microcell by Rogers in 2004. Microcell was selling wireless plans at highly reduced prices. Rather than compete on price, 2 firms (TELUS and Rogers) offered to purchase the company. Rogers successfully acquired Microcell and immediately proceeded to grandfather the company's low price packages. As such, firms that are able to compete on factors other than price; either through differentiation, efficiency or economies of scope and scale, will have significant advantages going forward.

3.3.1.4 Regional to national scope

ILECs are encroaching into each others territories. Rivalry is increased because players able to choose to enter into their rivals most lucrative market segments. Incumbents now need to defend their most profitable segments while still servicing their least profitable customers.

Figure 17: Telecommunication revenue distribution



3.3.1.5 Low Switching costs

Low switching costs increases rivalry because firms can viably target customers of rival firms. Switching costs for long-distance is non-existent as it only requires customers consent. Firms will pay for all administration charges associated with switching customers over to their service. There's been significant long-distance switching in the Telecommunications industry leading to significant reduction in per minute rates. Some firms have counteracted this by offering customers term contracts for additional discounts.

Switching local service had high switching costs given that customers had to change their telephone numbers. Local Number portability (LNP) is the ability for a subscriber to switch providers and keep their existing phone numbers and was thought to be the key enabler of local access competition. The switching hasn't taken place however because of the fact that most companies are choosing to not enter into the local access market.

Wireless Number portability (WLNP) is expected to significantly increase rivalry in the wireless segment because now customers are able to switch to rival providers while keeping their number. The effectiveness of term contracts, which are very popular in the wireless segment, in minimizing incremental churn rate ¹⁸ associated with WNLN still remains to be seen.

3.3.1.6 High-fixed costs, low variable costs and unused capacity

Telecommunications networks and services are costly to design, build, test and deploy. This increases rivalry because, once invested, firms are motivated to recoup their investment as quickly as possible. In the business market, telecom firms are willing to sell unused capacity at marginal cost. They are also willing to undercut other firms and, in certain cases lose money, for large volume deals.

¹⁸ Churn rate is a measure of customer attrition, and is defined as the number of customers who discontinue a service during a specified time period divided by the average total number of customers over that same time period. Telecom industry churn rates are calculated monthly.

3.3.2 Increasing threat of Entrants

3.3.2.1 Technology

The telecom industry is highly dependent on the capabilities offered by the underlying technologies that facilitate telecommunications. Providers that are able to provide functionality in a more cost effective manner, increase economies of scale and scope and operate more efficiently are at a competitive advantage. The constantly increasing performance to cost ratios of new technologies is making it easier and cheaper to enter the industry. Firms are able to develop and take services and products to market faster and respond to market developments faster than ever before. The new entrants to the industry are highly agile, adaptable and thus are more adaptable and willing to take more risks to carve out a niche.

3.3.2.2 Regulation

Regulation, enacted in Canada by the CRTC, plays a significant role in the ability of entrants to enter the telecommunications industry and the avenues open to incumbents to address the competitive threats that they bring. The CRTC's mandate is to facilitate a "sustainable competitive Canadian communications industry"¹⁹ and to ensure that Canadian consumers have "increased access to a variety of innovative, high-quality communications services, at reasonable prices that meets consumers' needs and reflect their

¹⁹ CRTC work plan

values"²⁰. While some may question whether regulation is the best means of achieving these goals, there's no doubt that the CRTC has a profound impact on the Canadian telecommunications landscape. In fact, outside of private interests there is no single organization with more influence on the Canadian telecommunications landscape than the CRTC.

Below are the three key ways that CRTC regulation impacts entry into the telecommunications industry.

1. Encourages Competition

CRTC encourages new entrants into the industry by requiring that incumbents lease network facilities to competitors at prices set by the commission. This allows new entrants to bypass the high-fixed costs associated with implementing telephone networks. This is the model employed by Competitive Long Distance carriers such as Call –Net (Sprint Canada) and resellers and rebillers such as Yak Communications.

2. Inhibits entry

In contrast to wireline, the wireless industry is a much more difficult industry to enter. While the technology required to provide service does not present an imposing barrier (since numerous vendors are available to supply network and other equipment and until fairly recently, they acted as key financiers as well), and although the costs of networks and other

²⁰ CRTC work plan

costs will limit the number of firms able to finance entry, the key barrier concerns the scarcity of spectrum, and the licensing process to allocate that spectrum. The CRTC governs the allocation of this scarce resource and most importantly the eligibility requirements of those wishing to bid. The CRTC also limits entry into the industry by limiting foreign ownership of telecommunications firms.

3. Defines and classifies telecommunications services and competitive criteria

One of the key quantitative measures that the CRTC has defined is the forbearance threshold which defines the portion of market share that incumbents must lose before deregulation of local services occurs and is currently set at 25 percent. Up until this point, local voice services fall under CRTC pricing and tariff regulations and require approval before prices and service terms can be modified.

Of most significance to this paper and to the telecommunications industry in general is the recent series of CRTC rulings that sought to classify the various VoIP and IP-telephony services emerging in the market (Refer to Table 2 for a synopsis). Most notable of these is CRTC Decision 2005-28 which ruled that local VoIP services offered by ILECs would be considered equivalent to local voice telephone service. While those offered by CLECs and other non-incumbents would not be regulated. Also of note is the exclusion of peer-to-peer based applications (Category 1) from regulation.

It is outside the scope of this paper to assess the merits of this classification system and the rationale the CRTC used to guide their determinations, however, this decision is significant in that it influences the competitive dynamics of the marketplace. For instance, CLECs and new entrants could choose to ensure that as a group they do not gain more than 24.9 percent of the market from incumbents to ensure that incumbents remain regulated.

Table 2: CRTC Categorization of IP based telephony services²¹

Category	Definition	Examples
1	Peer-to-peer services.	MSN, Yahoo and Google chat
2	VoIP services that operate over a broadband Internet connection obtained by the customer from a supplier of choice and that enable the customer to make and receive calls to or from the PSTN and, typically, as well as to and from other broadband connected users.	Vonage, Skype
3	IP services that provide the ability to make and receive voice calls to and from the PSTN, as well as to and from other connected users and that are supplied with an underlying connection, other than a retail Internet connection, to the service provider's network	Incumbent telecom firms, cable companies
4	IP business services offered over network access facilities (LAN, WAN), either provided by the service provider or by another party, connected to the service provider's IP network and which do not utilize retail Internet services for connection to the service provider's network.	Incumbent telecom firms, ISP's

3.3.3 Low to Medium Supplier power

3.3.3.1 Labour

Labour is the single largest operational expense of telecommunication firms. In the telecommunications industry, labour is generally unionized and a small number of unions represent the majority of workers in the industry. This leads

²¹ CRTC Telecom decision 2005-28, paragraph 29. Examples are by author.

to labour suppliers having some power in collective bargaining and working conditions. This has resulted in labour groups having considerable job security, above market wages and the ability to influence the operations of the firm to some degree.

3.3.3.2 Vendors

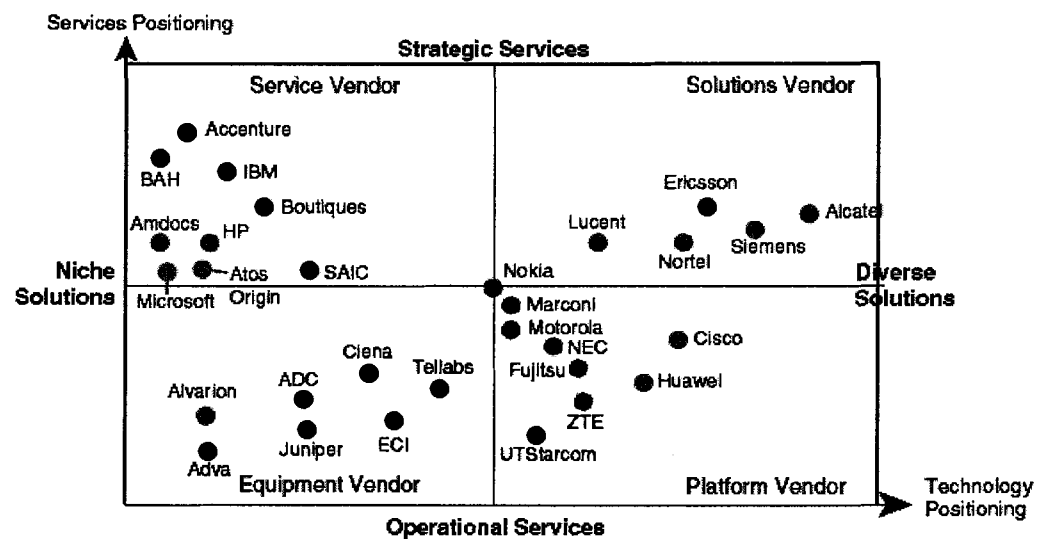
Since the dot com bust of 2000, equipment suppliers have had significant challenges getting their equipment sold. As such they have very little power and are essentially willing to sell to anyone. In general, there's minimal differentiation between equipment vendors and any differences in products are usually short-lived.

Reflecting the general trend in the telecommunications industry, there's been significant vendor consolidation in recent years driven by the increasing desire by buyers to deal with fewer vendors that provide end-to-end solutions and applications and the large investment, resources and infrastructure required to bring telecom solutions to market. Indeed, the differentiator for most vendors is the ability to partner with firms and provide resources that help the firms differentiate their service offerings.

Figure 18 shows the stratification of vendors into specialized or diversified solution providers and those that focus on operational requirements or more strategic activities. Another notable shift in the vendor space is the increasing presence of non-traditional vendors such as Microsoft in the OSS/BSS space. This is reflective of the fact that network providers have increasingly begun to converge on IP-based networking standards that aim to deliver multiple services

to multiple devices. Given this homogenization of suppliers, firms that are able to best harness vendor relationships to bring differentiated offerings to the market will gain significant advantage in this industry.

Figure 18: Vendors organized by Market Focus



Source: Gartner Dataquest (November 2004)

3.3.3.3 Capital

Given the low-growth, highly capital intensive environment that telecom firms operate in, capital markets have taken a cautious stance on the industry. There have been some very high-profile telecom and network provider bankruptcies including WorldCom/MCI, Group Telecom and 360 Networks. Consequently, capital suppliers have tended to be quick to downgrade the rating of telecom firms and thereby negatively impact a firm's cost of borrowing.

3.3.4 Increasing power of Substitute products

As discussed in section 2, the long-term impact of disruptive innovation is essentially the substitution of telecommunication services with alternative technologies and paradigms. In this respect, this is the area where disruptive innovation impacts the telecommunications industry the most. Substitute products such as e-mail and Voice over IP (VoIP), alternative access technologies such as wireless and broadband over cable combined with changing customer attitudes toward IP-telephony and alternative channels will simply increase the substitution effect.

It is expected that acceptance and adoption will only increase as the functional gaps between traditional telephony and substitutes continue to narrow. To this end, the degree that firms can innovate to either profit from the substitution effect or mitigate its impacts through efficient allocation of resources and find compelling ways to differentiate its products from substitutes will determine how well firms cope with this force.

3.3.5 Low to medium customer power

3.3.5.1 Concentration

Customers of telecommunication products, with the exception of large enterprises, are largely diffuse and thus have very little power individually to influence firms in the industry. However, the proliferation of the Internet, low or no cost alternatives, technology that is easier to use and adopt and a customer base that is increasingly comfortable with technology is facilitating adoption of substitutes at a much faster rate than ever before.

3.3.5.2 Low switching costs

Low switching costs increase customer power because they can easily migrate to another firm. In the wireless space, WLNP promises to lower costs more given that consumers can now switch to alternative wireless carriers and retain their existing number.

3.3.5.3 High acquisition costs

The cost of acquiring new customers and that of luring customers away from competitors is significantly higher than keeping an existing one. Customers generally now have much more influence over their provider if they realize that a competing offer is more compelling than the one offered by their current provider. In fact, customer churn is one of the key metrics that the wireless companies monitor. Companies frequently offer incentives to customers that are highly likely to churn.

As a whole, a firm's ability to manage the increasing power of the customer by being able to cost-effectively acquire and retain customers is a key success factor in the industry.

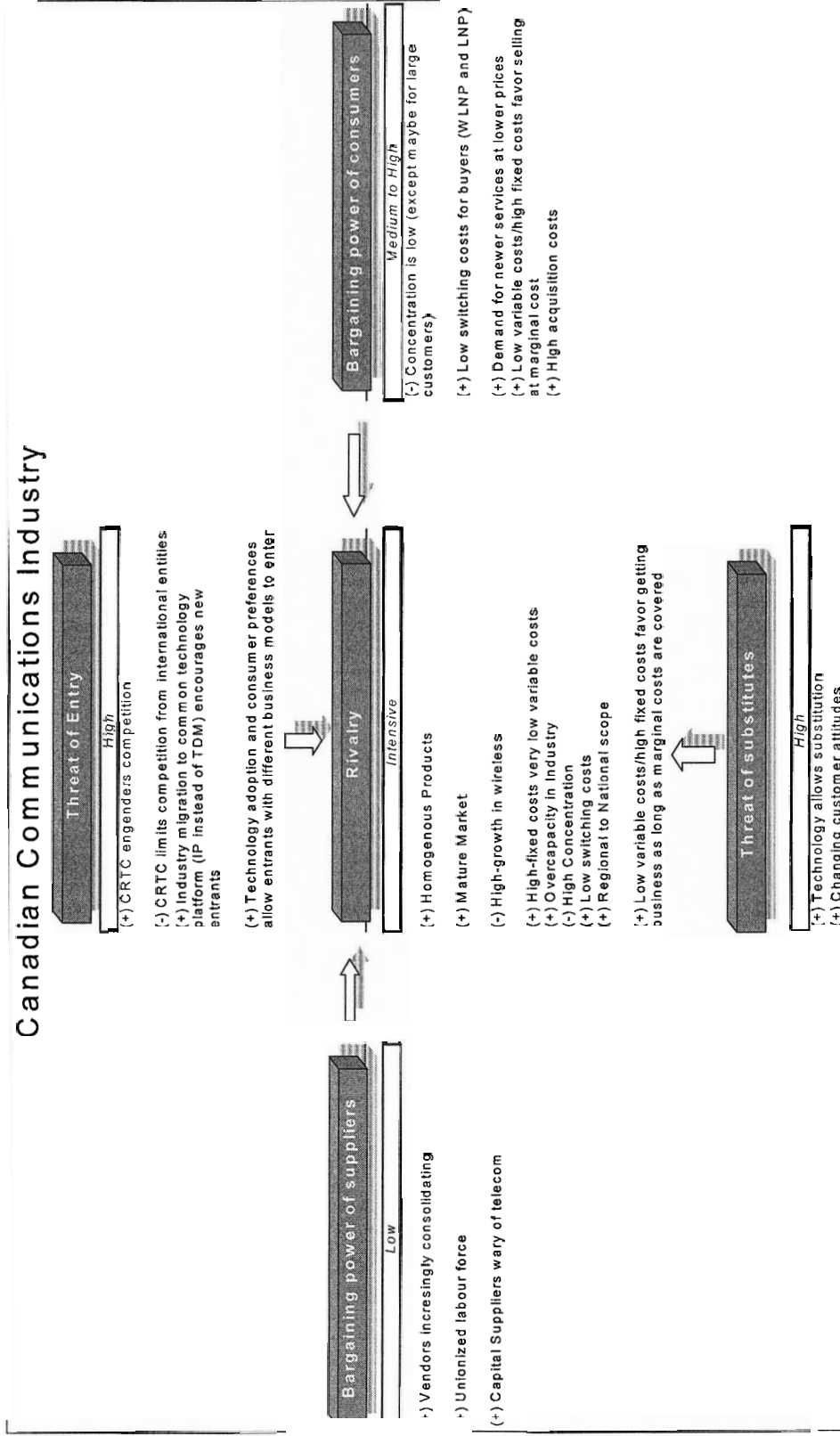
3.3.6 Competitive Forces Summary

Error! Reference source not found. summarizes the competitive dynamics that govern the telecom industry of today. The competitive forces described in this section manifest themselves in four key areas known in the industry as the 4C's.

1. Commoditization - Significant downward pressure on wireline long-distance revenue which will increase with increasing adoption of IP Telephony, declining local access and data rates as a result of resellers and lowering costs of competitors, and slowing penetration of broadband services, all combine to commoditize the wireline segment of the communications business.
2. Cannibalization - Wireless migration has been the source of all growth in the communications industry in the past decade. This growth however comes at the price of wireline services. In Canada, the wireless subscriptions are expected to exceed wireline subscribers by 2007²². Other products such as SMS and VoIP are also going to decrease demand for wireline services even more.
3. Competition – Which is already increasing given entrants such as MVNO's, non-traditional providers such Yahoo and Vonage will create even more competition in the industry.
4. Consolidation - Given the factors named above, rivals in this mature market are consolidating. Six firms dominate the Canadian communications industry. In the early 1990's there were at least 20 firms. While such a highly consolidated industry structure tends to mitigate competition, it also creates a situation where every rival has the resources and finances required to compete effectively in the industry.

²² ITU-2005

Figure 19: Telecom Industry Five Forces



Adapted from Porter, 1979

3.4 Key success factors

While the near and short term outlook for the industry is still positive given that the wireless segment is still growing and the data and high-speed Internet access markets have not fully matured yet, the long-term innovations described in section 2 will only increase competitive pressures even more. Notwithstanding the long-term implications of disruption, as the growth of wireless and data begin to slow combined with the technological change and the increasing threats of entry in an industry where incumbents are tightly regulated will require that incumbents be, more than ever, adept at delivering value, harnessing technological change and executing on strategic initiatives. There's very little room for error and there's no shortage of rivals who will gladly take market share from those that don't keep up.

In order to succeed in this space below are some of the key success factors that firms must excel in.

1. Customer Retention

As rivalry, threats of substitutes and consumer power increases, the ability to retain profitable customers will determine which firms will survive. This factor is particularly important as industry consolidation allows rival firms to offer an increasingly wider breadth of services and solutions to customers. Furthermore, as competition from both industry incumbents and new entrants continues to intensify, the ability of a firm to find the

optimal combination of customer service quality, product and service reliability and cost management relative to others will determine the extent to which it will be able to mitigate customer defections.

The value chain elements that have the most impact to customer retention are the network operations, marketing and sales and service assurance functions. The network operations functions are important to the degree that services must meet customer expectations while network infrastructure and supporting services be economical and flexible to operate. The marketing and sales functions are important in that products and services must be targeted appropriately, be priced competitively and generate a positive NPV for a firm. Service assurance functions significantly impact customer satisfaction which tends to impact customer loyalty. In the wireless space, Customer Churn and Cost of Acquisition are the key metrics used to measure effectiveness in this area. Of the three major wireless carriers in Canada, TELUS is currently leading in both of these indicators.

2. Innovation

The telecommunications industry is not considered to be a particularly innovative industry in the sense that its core service exhibits little or no differentiation. Telecom providers in turn have traditionally marketed products horizontally—promoting all products to everyone, everywhere. The forces of increased competition and cannibalization combined with consumers increasingly demanding innovation and incremental

functionality at reduced costs means that firms will have to find innovative ways to classify, segment and reach their customers. Furthermore, firms will have to find innovative ways of delivering services and solving problems.

The value chain components that most directly contribute to this success factor are the R&D, product and service development, and marketing and sales functions because they impact the degree that firms are able to accurately perceive market trends and shifts in customer preferences and deliver compelling products and services. Furthermore, firms that are able to form strategic partnerships that leverage capabilities and expand addressable markets, and defend that market against rivals will succeed in this space.

Innovation however is not limited to the market facing functions of the value chain. Now more than ever, firms that are able to engender an organizational culture of innovativeness, entrepreneurship and ownership will be more effective and more successful in the future than those that remain in the traditional telecom monopolistic, bureaucratic, utility company mindset.

3. Cost management and revenue growth

Managing costs through technology, process improvement and operational improvements is a given in this industry. The firm that most effectively funnels its resources most effectively and thus gain the largest return from every dollar invested will win. The firms that are able to best

balance cost management with revenue growth will show the best net profitability which will allow for further expansion and selective investments in differentiating services.

The value chain components that directly impact this success factor are the network operations, marketing and sales and service assurance functions. In the telecommunications industry, the network (and the resources that manage and operate it) is the production line and the firm that has the most efficient, flexible and robust production line has the advantage. Similarly, marketing and sales and service assurance functions play a role by maximizing network utility and ARPU while service assurance ensures that churn is minimized.

4. Meaningful differentiation in the marketplace

As technological innovations begin to facilitate a convergence of capabilities within the industry, the firm that is most able to demonstrate a differentiated and compelling value proposition has a competitive advantage. Differentiation in this context refers to network reach and functionality as well as value-added services and products that enhance overall network offerings rather than pure technological differentiation. An example of this would be solutions and products aimed at specific business verticals, consumer lifestyles and demographics that generate additional revenue and positive overall returns.

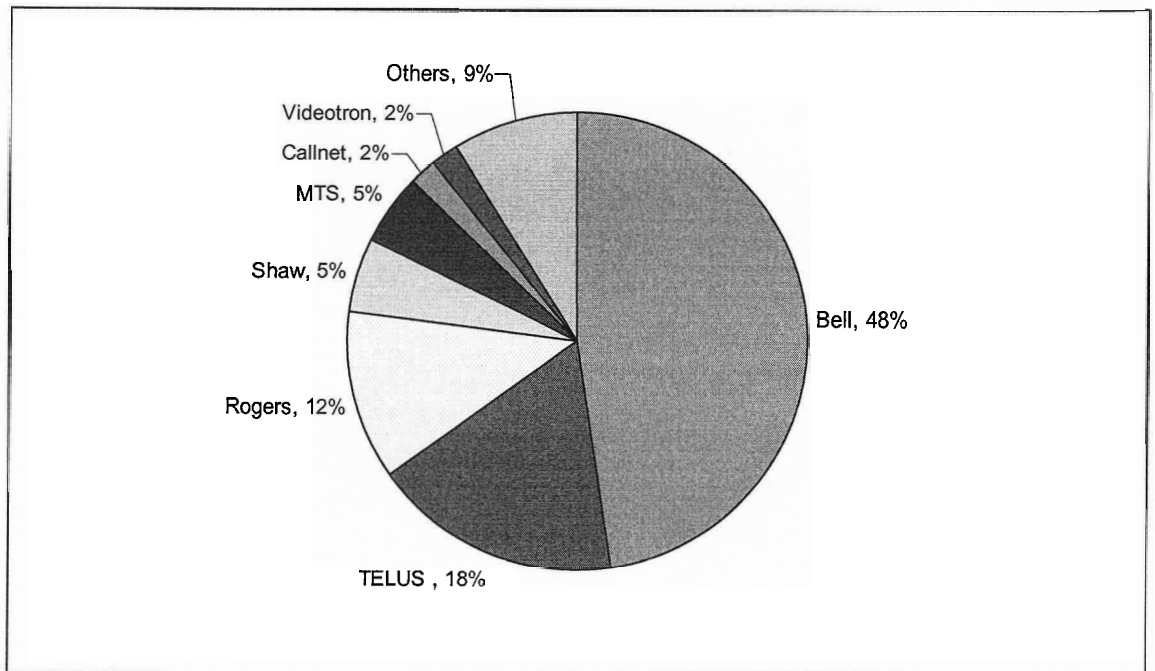
The value chain components that most impact this success factor are the R&D and service and product development functions as they impact a firm's ability to create compelling and differentiated offerings.

The amount by which telecom firms can differentiate themselves is going to be a critical success driver both in the near-term and especially more so in the long-term. In the near-term differentiation comes in the form of effectively addressing key market segments in compelling and highly differentiated ways. The extent to which firms can successfully identify the differentiation criteria, formulate the appropriate differentiation strategy and execute on that strategy is a key requirement for any firm wanting to survive in this industry.

3.4.1 Competitive analysis of firms in the industry

Figure 20 shows the top firms in the telecommunications industry based on revenue as a percentage of total market. This section will provide an overview of the key competitor categories in Canada and compare each firm to TELUS in terms of their capabilities relative to the key success criteria described in the previous section.

Figure 20: Market share of top six firms²³



3.4.1.1 Telecommunication firms

Bell Canada, with 48 percent of the market is the largest telecommunications company in Canada. It provides wired and wireless telecommunications, Direct-to-Home (DTH) satellite and high-speed Internet services to residential and business customers. Relative to TELUS, Bell has significantly more resources and a much larger revenue base. However, since 2004, TELUS has demonstrated significantly more traction in the market in all key business indicators. In terms of key success factors, TELUS has been able to manage costs better, demonstrate innovativeness and, particularly in the wireless space, has been able to better differentiate its products from Bell Canada. TELUS and Bell are equal in terms of customer retention however; Bell

²³ Percentage of market based on 2004 Industry Canada data and includes all telecommunications segments (wireless, wireline, data, and broadcasting).

has focused its significant resources on increasing presence in Western Canada through acquisition and also through sponsorship of the 2010 Olympics. Bell is always going to be a significant threat to TELUS given its resources; however, TELUS can differentiate itself through more targeted offerings, innovativeness and cost management. The other telecommunications firms that TELUS competes with are not as large a threat to TELUS as Bell Canada. Both MTS and Call-Net are much smaller and do not provide the comprehensive set of services that TELUS does. While MTS has a dominant position in Central Canada, it does not have the network reach to provide services economically to the rest of the country. In this respect, Central Canada is an opportunity for TELUS to expand to given its broader portfolio and reach.

3.4.1.2 Cable companies

Rogers Communications Inc. owns Rogers Wireless, Rogers Cable Inc. and Rogers Media Inc. Rogers primary threat to TELUS is its national wireless and data footprint and to a lesser degree its ability to provide a similar portfolio of services (wireless, data, TV) as TELUS in Eastern Canada.

Shaw Cable is the incumbent cable operator in western Canada and primarily provides broadcasting services and Internet and, more recently, residential voice services. Shaw currently does not have a wireless product.

The particular threats to TELUS posed by cable companies include a higher capacity access infrastructure able to support voice, video and data without significant infrastructure investment, a reputation for providing superior customer service and a willingness to aggressively discount new services to gain

market share. However, this is mitigated somewhat by the fact that cable companies do not have a presence in the SMB and Enterprise telephony markets.

To counter this, TELUS will have to rely on its ability to effectively differentiate services.

4 TELUS STRATEGIC ANALYSIS

TELUS' annual revenues of \$8 Billion make it the largest full-service telecommunications company in Western Canada and the 2nd largest nationally. Although recently merged into a single corporate entity, TELUS can be broken into 2 segments—wireless and wireline. This segmentation can be also further broken down into regions where it is the Incumbent Local Exchange Carrier (ILEC) such as Western Canada. In contrast, in Eastern Canada, Bell Canada is the ILEC and TELUS is considered a Competitive Local Exchange Carrier or CLEC.

4.1 Strategic Focus

Unlike other firms such as Bell Canada and Rogers which seek to complement and/or mitigate telecommunications revenue erosion by diversifying into ancillary industries such as broadcasting and entertainment distribution, content production and retailing, TELUS has focused on being a "pure-play" telecommunications company. TELUS' strategic intent, or vision, is "to unleash the power of the Internet to deliver the best solutions to Canadians at home, in the workplace and on the move²⁴" and its strategy for growth is "to focus on its core telecommunications business in Canada²⁵". In particular, TELUS

²⁴ TELUS 2005 Annual report. Management Discussion and Analysis: Core business Vision and Strategy. TELUS Corporation. (www.telus.com)

²⁵ TELUS 2005 Annual report. Management Discussion and Analysis: Core business Vision and Strategy. TELUS Corporation. (www.telus.com)

is focused on leveraging its wireless data and cellular offerings and its IP-One network for businesses.

TELUS' six strategic imperatives, in place since the year 2000, are as follows:

- Building national capabilities across data, IP, voice and wireless
- Providing integrated solutions that differentiate TELUS from its competitors
- Partnering, acquiring and divesting to accelerate the implementation of its core network focused strategy and focus resources on its core business
- Focusing relentlessly on growth markets of data, IP and wireless
- Going to market as one team, under a common brand, executing a single strategy
- Investing in internal capabilities to build a high-performance culture and efficient operation.

In support of these alternatives, TELUS has defined a set of values intended to guide employees and managers in defining the appropriate behaviours and actions expected in order to achieve the strategic imperatives listed above.

These are called the TELUS values and are comprised of the following:

1. We embrace change and initiate opportunity.
2. We have a passion for growth

3. We believe in spirited teamwork

4. We have the courage to innovate

Table 3: Strategic focus by segment and territory

	Wireless	Wireline
ILEC (Western Canada)	<ul style="list-style-type: none"> • Grow market share • Maximize ARPU and reduce churn 	<ul style="list-style-type: none"> • Drive down costs through operational efficiencies • Defend market share • Focus on Future Friendly home services for growth in fixed access market
CLEC (Eastern Canada)		<ul style="list-style-type: none"> • Harvest operational efficiencies to invest in differentiated services and products • Aggressively grow market share in select high-margin segments (business services and other value-add services) • Focus on SMB market

As shown in Table 3, TELUS' focus is to both grow and protect its existing revenue base. In particular, in areas where it is the incumbent operator, it seeks to reduce operating costs and maximize operating efficiencies. In areas where it is the CLEC and in the growing wireless segment, it seeks to grow by acquisition of customers and firms with complementary products and services.

In many respects, 2005, despite a four-month labour dispute, was a banner year for TELUS for the following reasons:

- The wireless division outperformed corporate guidance and market expectations.²⁶
- Accelerated wireline performance in growth markets in Eastern Ontario and Quebec.²⁷
- Successful negotiation of a new collective bargaining agreement (CBA).²⁸
- The merger of wireless and wireline should allow the company to both reap operational efficiencies as well as further develop synergies in products and solutions that allow TELUS to differentiate itself further from its competitors

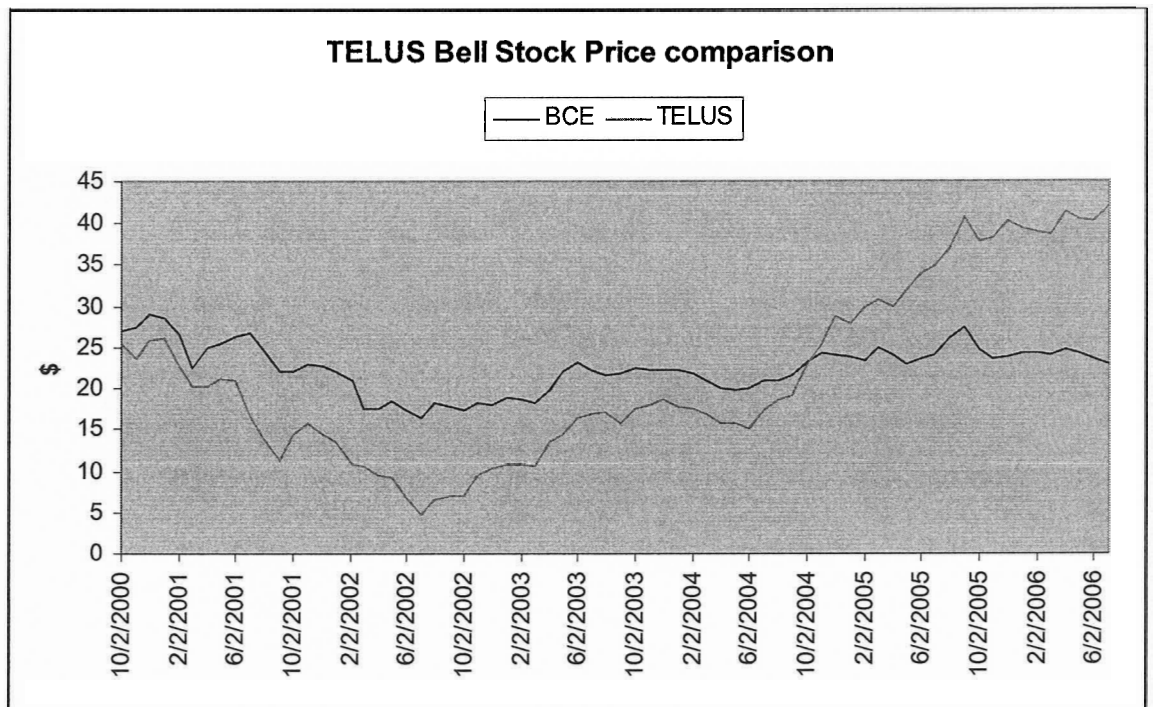
²⁶ TELUS 2005 Annual report. CEO letter to Investors. Page 2. www.telus.com “..wireless division exceeded expectations in 2005, generating a record number of new subscribers (584,000) and achieving 17 per cent revenue growth. Our wireless segment’s excellence in marketing operations, client care and network performance has led to an industry-leading average revenue per customer, operating profit growth and cash flow yield, as well as one of the best customer loyalty and retention rates in the global wireless industry.”

²⁷ TELUS 2005 Annual report. CEO letter to Investors. Page 2, www.telus.com “..non-incumbent business revenues increased by 13 per cent to \$632 million in 2005 and, for the first time, generated positive full-year EBITDA of \$21 million.”

²⁸ TELUS 2005 Annual report. CEO letter to Investors. Page 2. “The new five-year agreement provides increased operating flexibility and productivity, focuses team members on our core business, and facilitates better service for customers in an increasingly competitive marketplace. It fosters a culture of high performance with universal variable pay, which rewards team members when certain performance metrics are met, and encourages advancement based on merit as well as seniority.”

As shown in Figure 21, the investment market has also endorsed TELUS' consistent network focus, high exposure to wireless and its focus on IP and data as its primary growth strategy. From 2004 to 2006, TELUS' share price has almost doubled that of Bell Canada, TELUS' largest incumbent competitor.

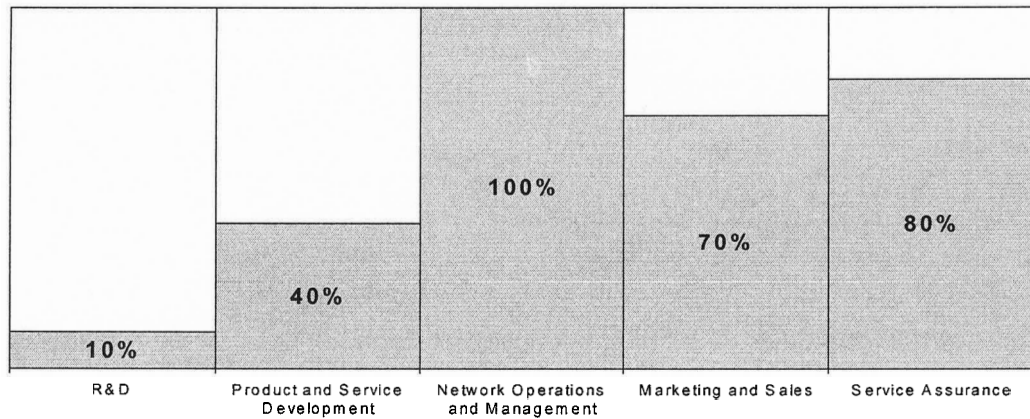
Figure 21: TELUS Bell Stock Price comparison



4.2 Value Chain

Figure 22 describes the portion of the industry value chain that TELUS performs.

Figure 22: TELUS' portion of Industry Value chain



4.2.1.1 Research and Development (R&D)

TELUS does not perform significant R&D. In certain cases, TELUS will embark on focused primary market research activities designed to size the market and gauge acceptance for a particular product or service. In most cases, TELUS gets information from vendors and consultants to determine the viability of a product or service.

4.2.1.2 Product and Service Development

TELUS typically partners with vendors and consulting firms such as IBM, Accenture and others in order to facilitate product and service development efforts. This is because the required expertise for new products and services reside outside the firm. TELUS provides the in-house process and infrastructure knowledge to enable and productize the service or product.

4.2.1.3 Operations

Once the new products are integrated into the operations and technology infrastructure, TELUS takes over the management, operations, provisions and billing of the service.

4.2.1.4 Marketing and Sales

TELUS' products are comprised of a) Consumer products such as wireless handsets, local access lines and High-speed internet access b) Business products such as telephone systems, data products, and more complex items such as communication systems and call centre products.

Internally TELUS categorizes the relative value of different product categories according to the value to the business. As shown in Figure 23 below, TELUS categorizes products into low and higher value products and services.

Figure 23: TELUS product value chain

Value to TELUS		
Connectivity	Hardware and Storage	Applications/Consulting/Outsourcing
Wireless, WIFI-WiMax	Mainframe, Desktop, Hosting, Data Centers and SAN	IT strategy
Call Centers	IVR, PBX and Call Center Applications	Application Development and Management
LAN, LAN Management, Ethernet, Broadband DSL	Data and Converged CPE – switches, routers and servers	Systems Integration
WAN, conferencing, collaborative services, network management and support	Voice CPE – IP-PBX	Outsourcing / Business Transformation
Local Access	Residential CPE	Consolidated billing

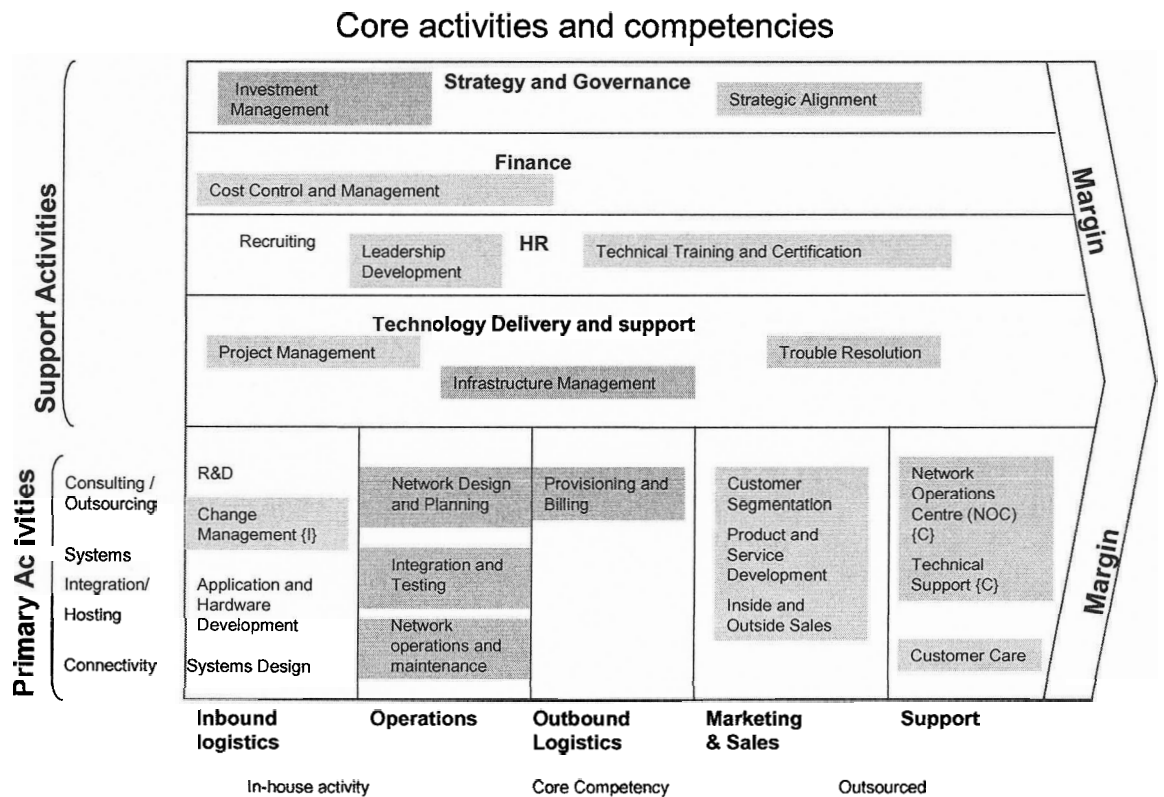
4.2.1.5 Service Assurance

TELUS' service assurance activities revolve around handling customer trouble calls, network troubleshooting and maintenance, customer care and systems support.

4.2.2 Activities and Core Competencies

Figure 24 depicts the core activities that TELUS engages in to bring value to the market. The following sections will provide further details on each section.

Figure 24: TELUS Core competencies and activities



4.2.2.1 Primary Activities

4.2.2.1.1 Inbound Logistics

As mentioned earlier, R&D, Application and Hardware Development is mostly outsourced to vendors, manufacturers and other organizations. TELUS tends to be a rapid-follower when it comes to innovation hence it tends to wait until technology is proven, stable and demonstrates market acceptance before it invests.

TELUS does lead internal change management efforts to ensure that Technology adoption and productization happens as efficiently as possible.

4.2.2.1.2 Operations

TELUS owns the network and therefore takes ownership of all activities surrounding the operation, maintenance and troubleshooting of the network. TELUS has developed considerable expertise in doing this and is a clear core competency.

4.2.2.1.3 Outbound Logistics

The primary activity that TELUS is involved in is the provisioning and billing of its services. TELUS spends significant money on billing and provisioning systems that can help it offer differentiated services. TELUS is moving to a new billing system that will allow it to provision services without requiring customers to have a local phone number. This will allow TELUS to sell data and Voice-over-IP services to customers that do not have a local line with TELUS (nor with anyone else for that matter). Implementation costs will be well over \$50 Million dollars and take over 3 years to complete.

4.2.2.1.4 Marketing and Sales

As shown in Figure 23, TELUS sells core network services such as access and connectivity and also enters into distribution and co-branding agreements with vendors for complementary products and services. Given the parity in core capabilities offered by telecom firms, the ability to differentiate via bundling, packaging, offering integrated solutions, a “one stop shop” service on a national basis is critical to remaining competitive in the market.

TELUS has gained considerable brand recognition in the market and differentiation from Bell Canada, its primary competitor, due to its unique advertising campaigns and the “Future is Friendly” slogan. This translates to the perception that TELUS is a more future-focused, agile and innovative counterpart to the monolithic and bureaucratic image of Bell Canada.

4.2.2.1.5 Support

The ability to provide a reliable and trouble-free service is a critical component of TELUS' value chain. Customers can easily switch to other providers if TELUS' service isn't deemed reliable. TELUS operates a Network Operations Centre (NOC) which monitors all network issues, manages threats and upgrades to minimize any service interruptions. TELUS also spends significant resources on Customer care activities related to trouble resolution. In some cases, these activities are performed by external agencies.

4.2.2.2 Supporting Activities

Supporting Activities lend value directly to TELUS' margins by ensuring that priorities, resources and activities are aligned with the firm's key objectives.

4.2.2.2.1 Technology Delivery and Support

Technology delivery and support activities such as project and infrastructure management and cost control provide key services by ensuring that people and capital are used in the most beneficial way possible. TELUS often hires external project managers to organize resources but always manages costs in-house. By doing this it is able to build core competencies around cost containment and capital efficiency.

Another core competency is the definition and adoption of trouble resolution practices aimed at minimizing downtime.

TELUS is known for its quality of technical training and its technical staff is highly regarded in the industry. TELUS also provides incentives for individuals who attain certain certifications and credentials. It also tends to pay above market rates for technically qualified individuals.

4.2.2.2.2 Investment and project management

Investment Management activities revolve around funnelling capital to the most beneficial and strategically beneficial projects and initiatives. TELUS has consolidated investment management activities into two bodies that collectively provide oversight on all strategic and tactical initiatives that require funding.

These investment management teams provide project approval, oversight and guidance for projects and include VP level representation from all business units.

Tightly integrated with this is a Project Management Office that oversees resource allocation and project budgets. Within TELUS, funds are highly controlled and monitored. Projects are required to be within 10 percent of budget and variances need to be justified and approved by the appropriate Investment Management team.

4.2.2.2.3 Human Resources

The changing telecommunications firms to invest in and source skill sets different from those previously valued in the telecommunications field. TELUS recruits talent from both within the traditional telecommunications industry as well as from industries outside this area including software vendors. Additionally, TELUS has also entered into a co-sourcing agreement with Accenture that essentially provides TELUS with broader, more consulting and change management oriented skill sets than before.

4.2.2.2.4 Strategic Management

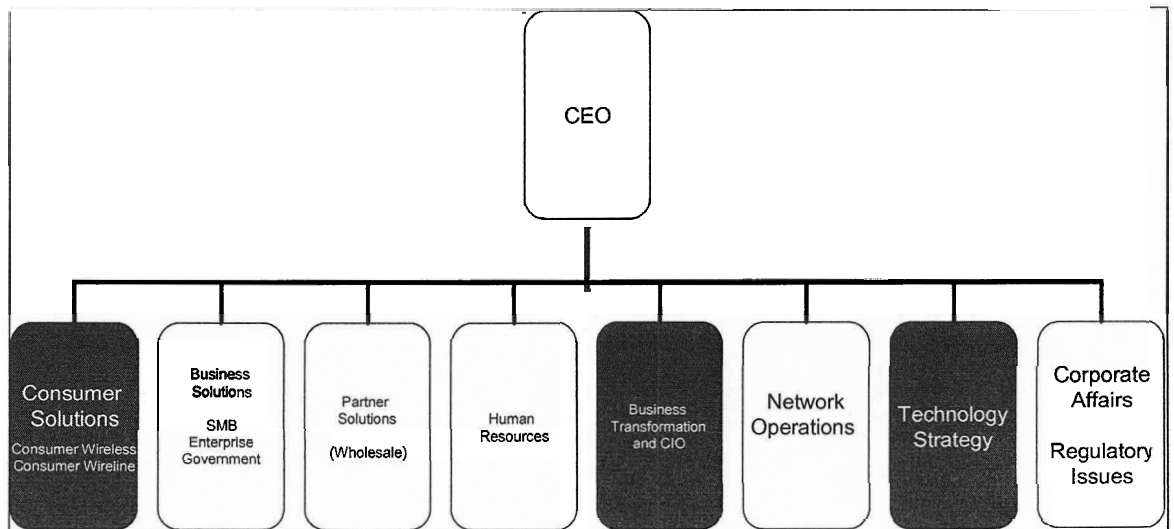
The Executive Leadership Team (ELT) forms the core strategic council of TELUS and represents the primary functional areas involved in every significant decision TELUS make.

The merger of TELUS wireless and wireline and brought significant changes to the composition of the ELT. Firstly, the entire wireless organization is now under TELUS' consumer solutions organization. This organization is further divided into

the wireless segment and the "Future-Friendly home" segment, which is essentially the wireline business, which alone generated approximately 50 percent of TELUS' overall revenues in 2005²⁹. Secondly, a new position called Technology Strategy was added to the team. Occupied by Eros Spadotto, this position leads the creation and execution of TELUS' integrated wireline and wireless technology strategy and evolution and determining TELUS' overall technology direction by identifying opportunities, establishing the long-term direction of TELUS networks, and implementing new technologies and services such as TELUS TV and CDMA wireless broadband services. He also leads a team responsible for designing the converged network for TELUS. Both of these highly strategic positions are occupied by executives from the wireless side of the organization further highlighting the organizations strategic thrust towards the wireless side of its business. Figure 25 highlights the positions represented in the ELT and the particular focus each has. Those positions occupied by executives from the former TELUS mobility organization are in blue.

²⁹ TELUS 2005 annual report. Overall performance. Available at www.telus.com

Figure 25: TELUS Executive Leadership Team Structure



The structure of the ELT supports TELUS' core strategy of focusing on its key customers: Wireless and data consumers, the SMB, enterprise and governmental organizations and, through the Partner Solutions organization, its wholesale customers. It also shows the network centric focus by having two positions that collectively are responsible for operating the network efficiently and one that looks to maximize the strategic value and impact of TELUS' infrastructure investments. Lastly, the ability to influence regulatory decisions and discussions facilitated through the Corporate Affairs business unit, are key competencies that TELUS depends on to execute on its strategy.


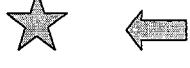


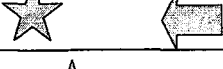




Since its inception in 2000, the ELT has been consistent in maintaining TELUS' strategy and has remained focused on carrying out decisions that support and actively reinforce those strategies. Some of this can be attributed to the leadership of the CEO, Darren Entwistle, who right from the beginning of his tenure, sought to change TELUS from a wireline focused business to one focused

on wireless and data. The oft-quoted term that he used in the beginning of his tenure is that TELUS would make a “90-degree turn” from a PSTN-focused network provider to one that focused on wireless and data and IP. This strategy has proved to be extremely prescient given the growth rates of the wireless and data markets which has resulted in TELUS growing from a \$5 Billion dollar company in 1999 to an \$8 billion company in 2006.

4.3 Strategic Fit analysis

By focusing on its core telecommunications capabilities as its primary vehicle for growth, TELUS is essentially following a cost-based strategy that seeks to maximize output and efficiencies from its core capability. Figure 26, illustrates TELUS' primarily cost-based strategy tendencies by illustrating where both the current state (the star) and the trend (the arrow) given the dynamics described in the matrix.

Figure 26: Strategic Fit matrix

Cost-Based	Differentiation
Product Strategy (Rapid follower)	
R&D Expenses (Low)	
Structure (Centralized)	
Decision Making (less autonomy)	
Manufacturing (Mass-Production)	
Labour (Cost-based)	
Marketing (Pull)	
Risk Profile (Low)	
Capital Structure (Conservative)	

Adapted from Bukszar 2006, class notes

4.3.1.1.1 Product Strategy: Rapid follower

TELUS generally follows a Rapid follower approach by introducing similar products at roughly the same time as its key competitors in Canada. In the wireless and wireline ILEC territories, TELUS has taken a slightly more innovative product strategy. In the wireless space, TELUS was first to market with a “push-to-talk” product that offers “walkie-talkie” functionality in a mobile phone. In June, 2006, TELUS partnered with XM, a satellite broadcaster, to offer XM programs over cellular phones. This technology allows XM content to stream to cellular phones using cellular data networks rather than satellite transmissions. In the wireline business segment, TELUS focuses on generating recurring revenue from the

underserved Small and Medium sized Businesses (SMB's) through offering innovative hosted solutions sold on a subscription basis.

TELUS like most other telco's has certainly had to be more innovative given changes in the market, technology and regulatory forces. When compared to telecommunication companies outside Canada however, TELUS product strategy isn't very innovative. Flagship services such as Wireless, High-Speed internet access, TELUS TV and the (soon to be introduced) Voice-over-IP and hosted services are all services that other telecommunications companies have introduced into their respective markets much sooner than TELUS.

4.3.1.1.2 R&D Spending: Low

TELUS has minimal internal R&D spending. It expects vendors to bear the cost of developing new products and services and in many cases share the cost of bringing new products and services to the market. Of the R&D that TELUS does do, almost all of it is targeted towards network technologies and platforms that could potentially lower costs, improve security, manageability, reliability and reach. A key example is the IP-One product family which was launched in June 2004 and is currently offered to businesses in 24 cities in Ontario and Quebec. IP-One Innovation service uses TELUS' next generation IP-based network to route calls and data, while providing business customers with a full suite of advanced applications and services.

4.3.1.1.3 Structure: Centralized

In early 2004, TELUS completed a major multi-phase three-year Operational Efficiency Program, which began in 2001 and attained cumulative

annual savings of \$538 million by the end of 2004. Building upon this base, in 2004 new restructuring activities in the Communications segment included a departmental reorganization of the information technology resources area, consolidating from 15 locations to two primary locations, which is expected to enable greater efficiencies of scale and effectiveness of program delivery. Two customer-facing business units were also integrated to improve the Company's competitiveness as well as its operating and capital productivity. This trend continued with the recent merger of the wireless and wireline segments which previously operated as separate entities.

4.3.1.1.4 Decision Making: Less Autonomy

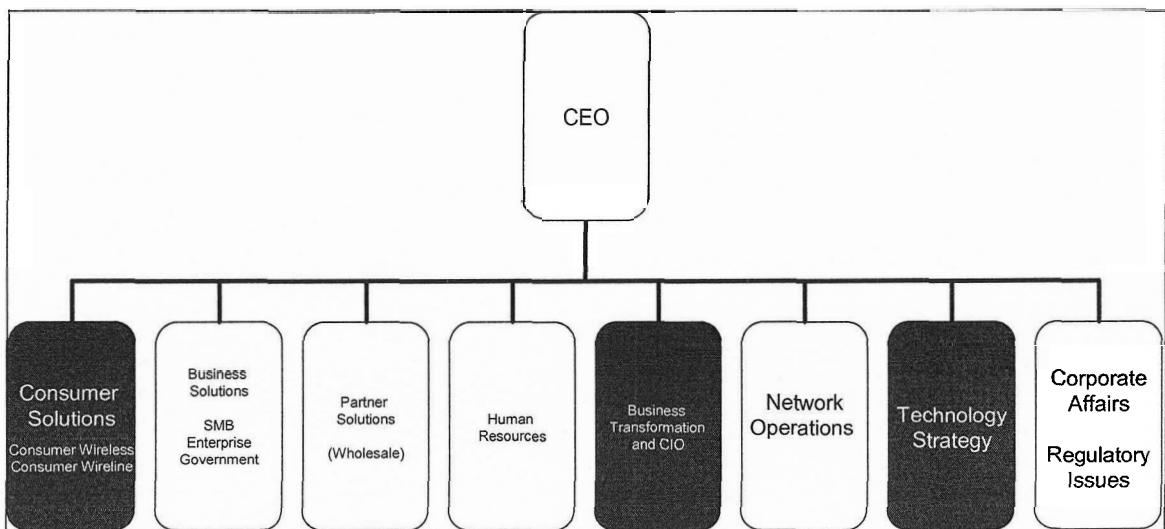
"Going to market as one team, under a common brand, executing a single strategy" is one of TELUS' core values. Clearly this implies that there is not much room for independence or autonomy in decision making.

The trend towards less autonomy in decision making is very evident at TELUS. A few years ago, TELUS moved to collapse its organizational structures intended to give leaders maximum visibility into day-to-day operations of their respective organizations. Employees are micro-managed and activities are highly-controlled. No significant decision can be made without approval. For example, VP level approval is required for travel to the U.S. Obviously, significant decisions can only be made with approval from several layers and only after rigorous process.

Although individual VP's have Profit and Loss accountability for their respective Business Units, TELUS' organizational structure is still very highly

hierarchical and all important decisions are expected to be approved by the Executive Leadership Team (ELT). Communication and direction is definitely top-down with and there's very little consultation with stakeholders prior to decisions being implemented.

Figure 27: TELUS Executive Leadership Team Business Unit Representation



4.3.1.1.5 Manufacturing (Production): Economies of Scale

The telephone network (both wired and wireless) is TELUS' primary production facility. TELUS is one of the first major telecommunications providers in the world to deploy an IP (Internet Protocol) based "Next Generation Network". This makes TELUS one of the first companies in the world to deliver carrier-grade Voice over IP calls.

In 2004, TELUS successfully migrated 84 percent of its long distance traffic to a single ubiquitous IP network designed to carry high-quality voice, data and video applications. By implementing NGN, TELUS hopes to benefit in three ways.

- Capital and operating efficiency through a much simpler network infrastructure promises significant reductions in operating costs.
- Scale economies increase given that all traffic can now be routed on a single ubiquitous network rather than several smaller networks.
- To a lesser extent, it enables TELUS to develop and deliver more innovative solutions that differentiate it from the market and also generate net new revenue streams.

4.3.1.1.6 Labour: High-Cost

TELUS' workforce is comprised into two primary segments. The larger segment is comprised of the former BCTEL and AGT employee base which consolidated into the TELUS wireline segment. The culture of this employee base is directly tied to TELUS' traditional monopoly roots. The other segment is the employee base from the former Clearnet organization that TELUS purchased and eventually became TELUS mobility. This organization evolved in the high-growth, rapidly changing and evolving cellular marketplace and thus has had to nurture a culture whereby agility, innovativeness and empowerment are valued over a culture of high control and process that characterises the wireline business.

For several years, both organizations operated independently, largely because of differing labour classification and CBAs that made it necessary to split operations resulting in little exchange of ideas and processes. Indeed, wireline employees have always felt that the wireless world was more freewheeling, creative and fast moving than the wireline world while wireless

employees felt that the wireline organization had more processes and more certainty in operations than in wireless.

Typical for most unionized workforces TELUS' workforce is paid above market rates yet are highly-inflexible. After years of unsuccessful bargaining and several months of work stoppages, TELUS recently signed a new collective bargaining agreement that unified five labour agreements into a single, national contract which should allow for a slightly more flexible and consistent labour environment. More importantly, it has also paved the way for the two organizations to unify into a common organization that seeks to combine the entrepreneurial spirit embodied by TELUS wireless and the rigor and process embodied by TELUS wireline.

To support this transition, TELUS has placed significant emphasis on shifting the TELUS corporate culture from that of an internally-focused, process-driven one to a market-driven, customer focused culture. Similarly, it has also introduced new processes and structure into the wireless operations intended to increase transparency and interlock into activities in wireless. In this respect, the TELUS Values Statements are designed to inspire individual and group behaviour that signals to both current and future employees what TELUS expects from employees.

4.3.1.1.7 Marketing: Pull Strategy

TELUS sells directly to its customers and does it through promotions, advertising and various direct sales activities. In areas where TELUS is a CLEC, promotions and sales activities are focused on the wireless and business services

segment. TELUS has also gained recognition in the industry as a market leader in introducing innovative wireless products such as the “Mike” push-to-talk cellular products and its IP-One service that aims to leverage TELUS’ IP-One network for business users. Nationally, TELUS has also gained recognition in advertising and marketing circles for its “The Future is Friendly” campaigns that use cute animals and retro music to sell and differentiate TELUS products.

4.3.1.1.8 Risk Profile: Low

When telecom companies were monopolies risk taking was neither necessary nor particularly good business. The arrival of competition, technological change and changes in consumer behaviour meant that carriers needed to expand and decrease costs but the overall industry profile has featured fairly stable revenues thus supporting low-risk strategies.

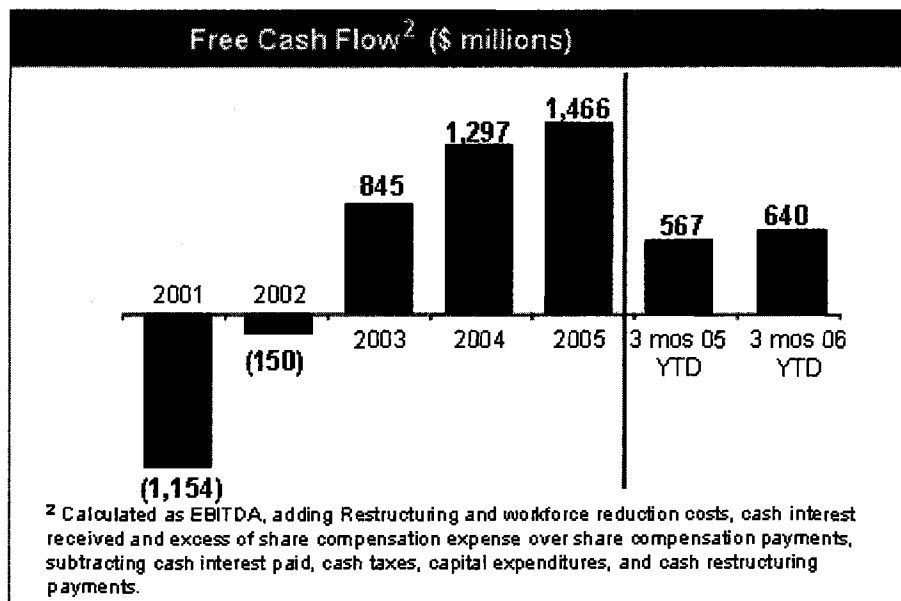
TELUS’ primary strategy is to focus on the core capabilities of its network. In comparison to Bell Canada, which has sought to diversify into content production and distribution, TELUS chooses to focus on the less risky and less costly strategy of securing its capability as a network provider. TELUS’ biggest acquisitions and riskiest move to date was the acquisition of Clearnet and to a lesser extent the implementation of the Next Generation Network (NGN).

4.3.1.1.9 Capital Structure: Leveraged

TELUS, like most utility based firms, is generally considered by the investor community as an income generating rather than a growth-oriented firm. As such, the market places a significant premium on its ability to produce positive cash flow. Consistent with its cost based focus, TELUS has focused on increasing

cash flow through maximizing efficiencies and reducing cost through workforce reduction, operational efficiencies and network simplification and consolidation. Figure 28 illustrates the results of TELUS' focus on generating cash from operations. TELUS primarily uses this cash to pay down its debt incurred in the purchase of Clearnet, repurchase a portion of outstanding shares, and pay dividends.

Figure 28: TELUS Free Cash Flow



Source: TELUS 2005 Annual Report. www.telus.com

4.4 Conclusion

In the past 5 years, TELUS' ability to manage its strategic elements to support its cost-based strategy has certainly paid dividends. In particular, TELUS' ability to meet the key success criteria discussed in Section 3.4 has been instrumental in its success to date. These elements include:

1. Above average customer retention

TELUS' core competencies around network operations and service assurance have allowed it to maintain its industry leading churn rates and ARPU.

2. Innovation

In large part to its "Future is Friendly" campaigns, TELUS is perceived by customers to be more innovative and more forward-thinking than other telecommunication firms. Moreover, TELUS has been successful in parlaying that brand image to allow it to charge premium prices and also offer differentiated services through partnerships that leverage its network capabilities.

As an organization however, TELUS will need to continue to develop a culture of entrepreneurship and innovation if it is to continue to be successful in the industry. While the merger of the wireless and wireline organizations should help in this regard, TELUS will have to continually improve in this regard if it is to be successful.

3. Managing costs

TELUS has leveraged its core competencies around network operations and service provisioning to help manage its costs. Similarly, marketing and sales and service assurance functions have allowed it to maintain ARPU and minimize churn. In this respect, TELUS has been able to minimize discounting and thus generate free cash flow to fund its operations and invest in infrastructure and system builds.

4. Meaningful differentiation in the marketplace

To a certain degree, TELUS has been able to differentiate its wireless offerings by partnering with content aggregators and content and solutions providers. An example of this is the recent agreement with Amp'd Mobile, Inc. ("Amp'd Mobile") for the sale and distribution of Amp'd branded services, targeted at a younger demographic, in Canada. As a result, Amp'd Mobile's mobile entertainment, information and messaging services will be offered in Canada, exclusively through TELUS, in early 2007.

Going forward, these differentiated offerings, to the degree that they are relevant and compelling, will allow TELUS to generate additional revenue, avoid price discounting and remain competitive.

TELUS' inclusion in the Dow Jones Sustainability index validates that the company is considered to be one of the best run companies in the world. Given this focus on its capabilities as a network provider TELUS has positioned itself to benefit from the core telecommunications opportunities in the next 5-10 years.

In this timeframe, the challenges it will continue to face are:

- Revitalizing wireline revenue and minimizing or reversing revenue erosion on the wireline side.
- Maintaining its industry leading ARPU in the high-growth wireless and data businesses.

- Although, Canadian wireless penetration rates are low compared to that of the US, TELUS will have to effectively plan for slower growth of wireless and data related revenue in the years to come.
- The merger of the wireline and wireless segment should result in efficiencies and cost savings however, the challenge is to continuously find significant efficiencies in the future.

Overall, the company has remained consistent with the cost-based strategy and should continue to see dividends from it in the near-term.

The next section will discuss how TELUS, given its current strategic focus can effectively address the next wave of disruption given its current strategic focus and capabilities.

5 RECOMMENDATIONS AND CONCLUSION

TELUS' current strategy of focusing on growing by increasing its network footprint and capabilities has been largely successful in that it has allowed it to increase penetration of its wireless and data offerings and, in non-ILEC markets, increase wireline revenue by allowing it to penetrate the Enterprise and municipal and government markets. Furthermore, this focus will serve TELUS well in the drive to increase its ARPU given the revenue generating capabilities of its new cellular data services such as TV, XM radio and other similar network-centric offerings.

5.1 Phases of disruption

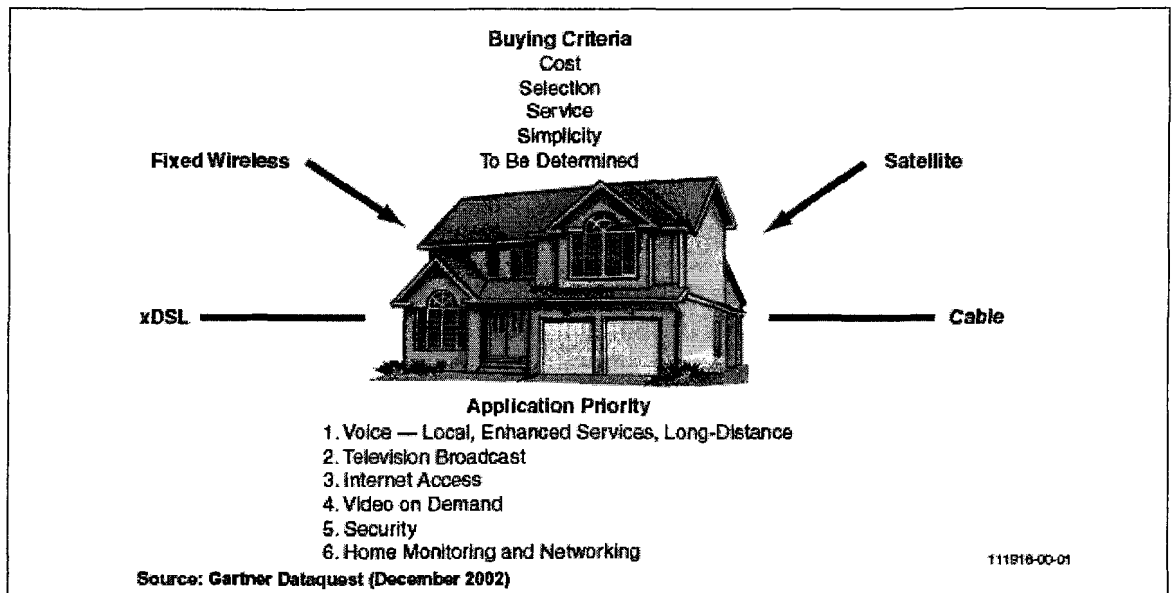
Section 2 categorized the impact of disruptive innovation into near, medium and long-term phases. Each phase represents a specific set of challenges and strategic impacts to TELUS given that they are fundamentally different dynamics at work. In this section we will further characterize these phases, outline the specific threats and opportunities posed by each and compare them to TELUS' current strategic and organizational capabilities and recommend key changes and capabilities that TELUS must acquire or develop in order to succeed in each phase.

5.1.1 The triple play phase

As network operators begin to develop capabilities in delivering multiple services through their infrastructures, the first phase of the disruption sequence

will be the battle for ownership of the consumer communications and connectivity experience. In this phase, all network operators will be vying for the voice, video and data triple play as part of a larger strategy to own the total consumer communications experience.

Figure 29: The triple play battleground



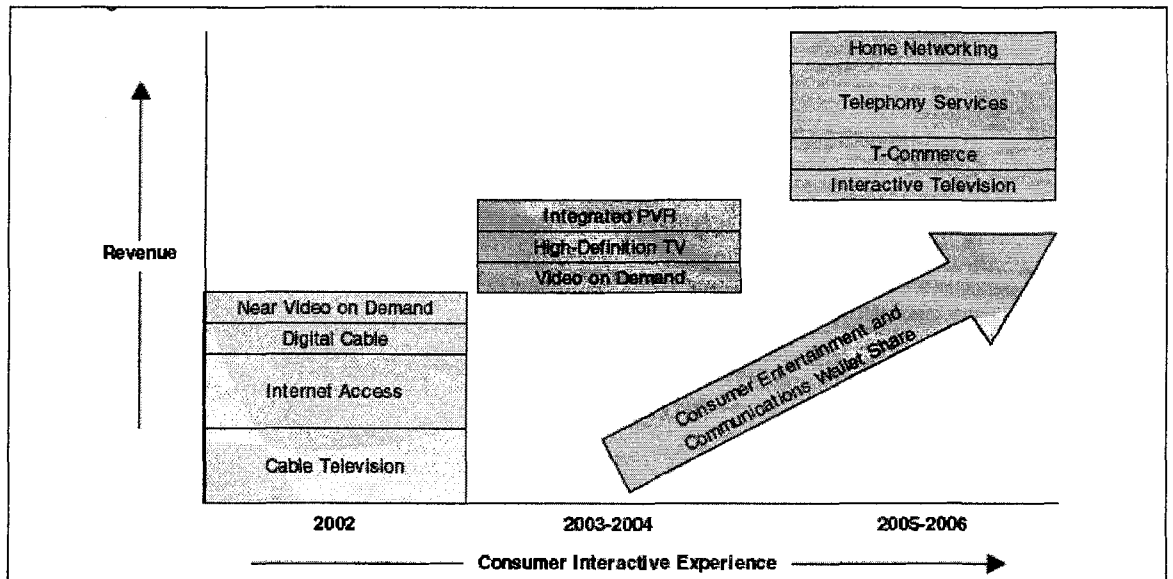
The two key drivers in this phase are:

- a) Additional Revenue

Each additional service that a provider can offer to its consumer base provides an incremental revenue stream that can significantly increase ARPU. Figure 30, shows the triple play value proposition from a cable company's perspective. In addition to the products depicted below, cable companies that can offer cellular service (such as Rogers)

stand to benefit from having the ability to offer the quadruple play of fixed voice, data, video and wireless.

Figure 30: The cable company triple play value proposition



Source: Gartner Dataquest 2004: Telco Cable battle for customers

b) Customer Retention

Perhaps the single most important driver for the triple play is the higher amount of customer "lock-in" that a firm hopes to gain with each incremental service sold. For this reason, most network operators will be willing to sell incremental services at highly discounted rates to make the service more attractive and harder to switch from. Another important consideration is that, by definition, each customer that subscribes to multiple services is a high-value customer and is exactly the type of customer that network providers want to retain.

5.1.1.1 Critical success factors

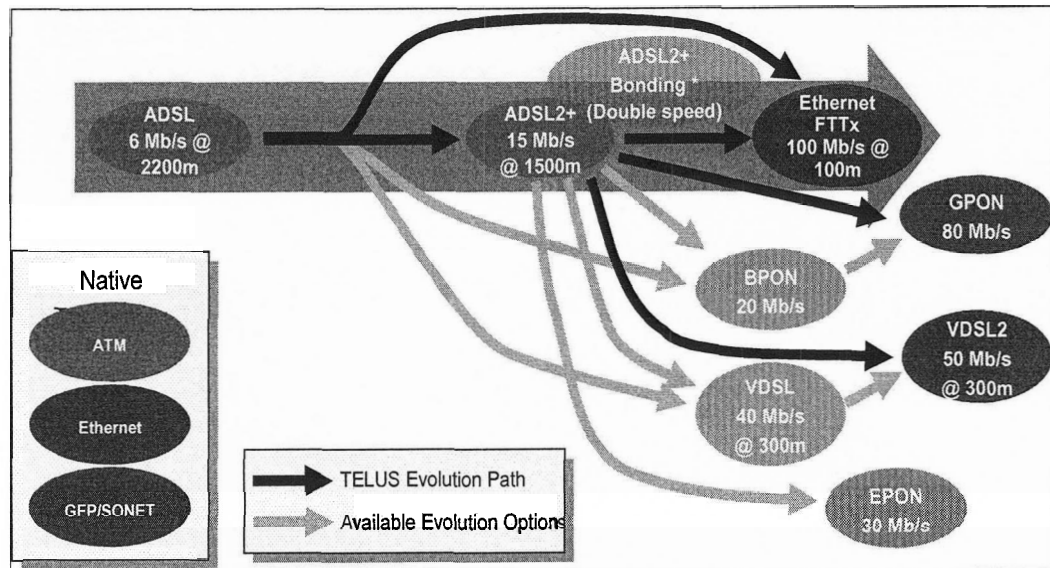
The key factors that will determine the ultimate winner in this phase will be the network provider that is able to reach and retain the most consumers, offer a compelling set of differentiated services and bundles, in a manner that is economically viable and price competitive with other providers. The following section will elaborate on these and also highlight TELUS' abilities and competencies in this area.

5.1.1.1.1 Network reach and functionality

As the network is the primary service delivery vehicle and competitive differentiator in this phase, TELUS is well positioned to compete effectively for consumers. The key disadvantage that TELUS faces over cable companies is that TELUS is currently unable to deliver HDTV content given the bandwidth limitations of its network.

To address this, TELUS can put its core competencies around network design and planning, integration and testing and provisioning and billing capabilities to work to help develop TELUS' network capabilities. As shown in Figure 31, TELUS primary focus is to increase the bandwidth it can deliver to the home through investing in next-generation access technologies that leverage its core ADSL capabilities and ultimately move into FTTC, GPON and VDSL2 based access technologies. These technologies will significantly improve TELUS' network capabilities by offering significantly increased bandwidth and, in the case of FTTC and GPON based technologies, offer an all IP network that extends directly to the home.

Figure 31: TELUS network evolution roadmap



The key challenges that TELUS will face as it evolves its network is allocating investment and managing resources in the most effective manner. GPON technology is price comparable to the traditional copper-based technology so deploying it in "greenfield" environments such as new buildings, suburbs and other areas makes economic sense. However, TELUS also still has to service a large installed base creating a situation where it will have to operate disparate networks with differing architectures which is an expensive and complicated proposition. An issue that TELUS faces is that cable has a higher penetration rate given that cable technology has no distance limitations associated with it. To a certain extent some of this will be mitigated as areas become denser and begin to warrant having facilities closer to the population base. Furthermore, it will need to carefully manage the interlock between supply and demand for bandwidth because it does not want to have new assets not generating revenue for extended periods of time. To achieve this balance, TELUS

will need to rely on both its cost control and management capabilities and infrastructure management competencies however, these challenges are not new to TELUS and its significant experience in these areas given its core competencies around network management and operations should allow it to meet this challenge successfully.

5.1.1.1.2 Service provisioning

Related to the point above is the ability to change the service provisioning capabilities of TELUS to accommodate new services and products by moving away from its current telephony oriented systems and processes to one where a multitude of services and customer types can be effectively and economically provisioned, managed and charged to customers. The customers that TELUS will be selling services to may not have traditional telephones at all but instead only subscribe to an Internet connection. This paradigm is a significant change to the way that TELUS' systems and processes have been designed.

TELUS can leverage its technology delivery and support competencies to deliver these capabilities. TELUS has recently embarked on a transformational program called "Imagine", which will streamline TELUS' current processes and also allow it to provision non-telephony related services and products like video. This project is a significant undertaking in that it is specifically designed to remove the limitations TELUS currently faces with respect to provisioning non-telephony products. While early in its implementation phase, this program is the stepping stone for TELUS to move into providing multiple services efficiently and effectively. Given that TELUS does not have the internal resources required to deliver a

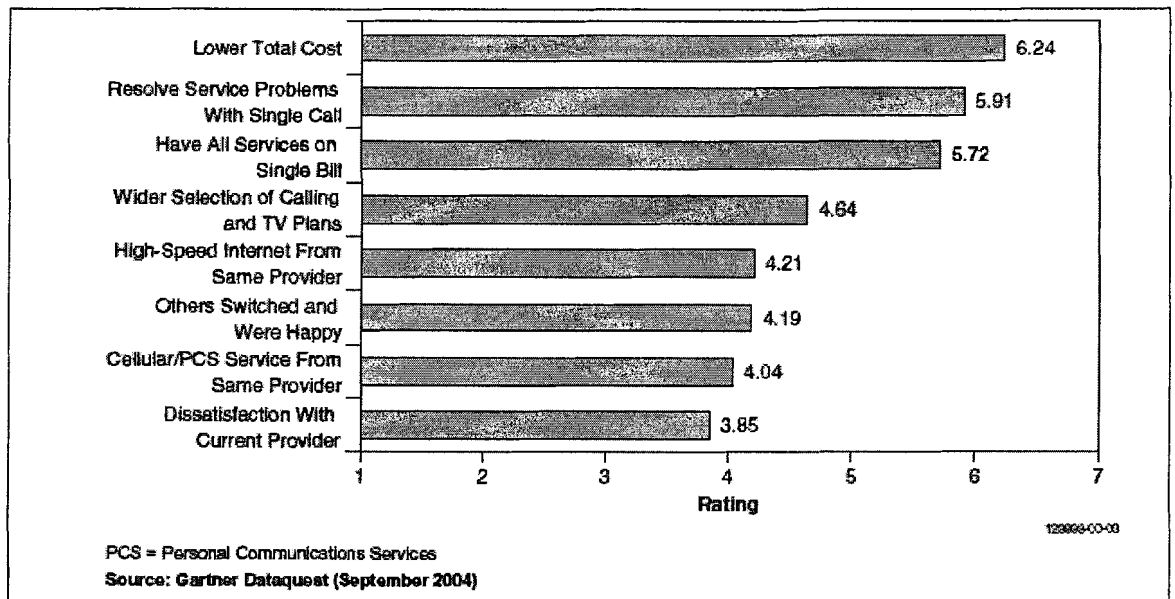
project of this size, TELUS has in-sourced significant resources from Accenture and other system integrators who operate under the guidance of TELUS internal Project Management and Infrastructure management areas.

5.1.1.1.3 Service differentiation and marketing

In 2004, Gartner Research attempted to gauge consumer receptiveness to a single-provider for all communications, data and video services by asking consumers "If your household had the opportunity to receive all of your voice calling and television services from one supplier (possibly a cable company, telephone company or satellite company), how important would each of the following factors be in influencing your decision to try a single-provider plan?"³⁰ The results as shown in Figure 32 indicate that users would view lower total cost, a single point of contact for trouble resolution, a single bill and a wider selection of services as the top motivators for changing to a single provider.

³⁰ E. Jopling et al. Gartner Research. "US Triple-play subscriptions increasing". September 2004, pg.2

Figure 32: Triple-play purchasing criteria



As a triple-play provider, the key value proposition that TELUS offers customers is the "single-bill", a single point of contact for service resolution and lower prices on a bundled package compared to stand-alone services. However, TELUS will also have to meaningfully differentiate products and services. Without this ability TELUS will have to resort to price cutting which will quickly erode into margins.

While TELUS has some competencies in the Service and Product development area, TELUS still has organizational gaps in this area. Specifically, it will need to further strengthen its ability to create compelling, differentiated offers. To do this it will need to reinforce internal resources with outside hires who have the experience and innovativeness to develop a differentiation strategy that focuses on a combination of brand, product and price. Currently, TELUS' TV offerings are differentiated through innovative, "Future Friendly", applications

such as the TV portal which provides users a TV schedule, call-display, and program preview functionality on one screen. Additional differentiation should be pursued to include specialized programming, unique and more interactive content, and other differentiated products and services.

5.1.1.2 Strategic Fit

As wireline revenues continue to erode, TELUS will increasingly rely on wireless and data services revenue. TELUS core competency as a network provider will help it compete effectively in this phase. To the extent that it can effectively

- a) manage the evolution of the network to ensure optimal capital and revenue interlock while effectively managing the demands of the existing installed base,
- b) acquire and retain customers by managing the reliability, service quality and provisioning aspects of its operations particularly as it relates to the new services it will be providing, and,
- c) create a differentiated product offering that elevates TELUS' TV offerings to more than just a copy of that provided by Shaw. This innovation is particularly critical to TELUS as this will minimize the price discounting that will inevitably begin as both Shaw and TELUS begin to move more into each others markets. Furthermore, TELUS will need to build complementary

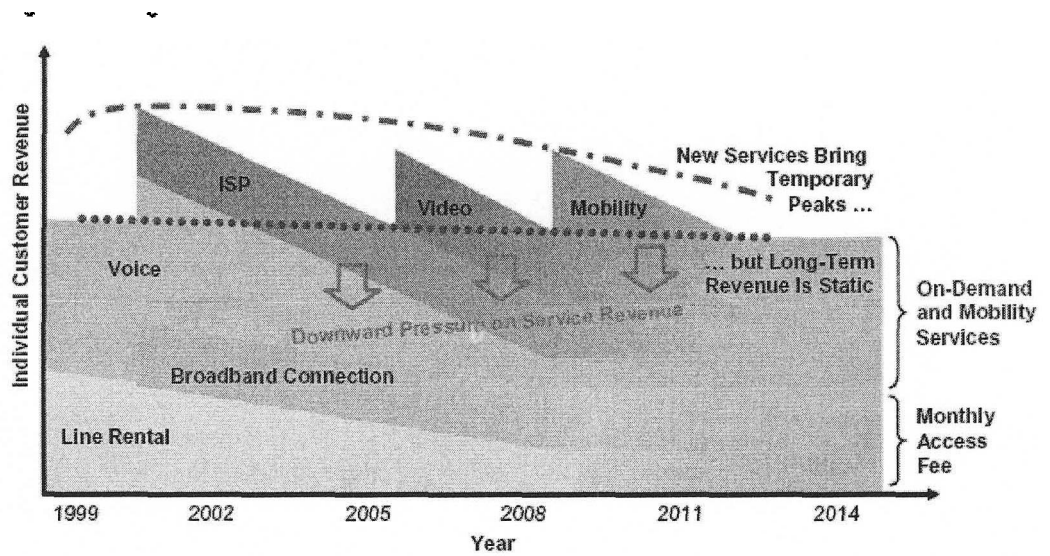
capabilities as a content distributor that will allow it to compete more effectively with cable companies in the areas of content management and distribution.

It is still early to tell whether the telecom or cable triple play approach will win. Currently, there are more cable-based telephony subscribers than there are telecom-based TV subscribers, however, the fact that TELUS currently cannot provide HDTV is certainly impacting TELUS' ability to attract customers to TELUS TV. However, provisioning basic TV services and upgrading the network to eventually provision HDTV is one of TELUS' highest corporate priorities.

5.1.2 The content phase

In the medium term, even loyal customers that continue to buy all their services from one provider will generate only flat revenue. As shown in Figure 33, new offerings such as data, video (both packages and video on demand [VOD]), and converged mobility services will bring temporary revenue spikes. However the effects of competition will erode the incremental value to the incumbent over time.

Figure 33: Long term revenue outlook for the triple play



Source: Gartner (December 2005)

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A trend toward a simple mix of fixed monthly fees plus on-demand services is likely to occur. The monthly fee will ultimately cover commoditized services, such as voice calls, data services, videophone, multi-media access and "home" services (security, calendaring and media storage). This low-margin business will continue to be owned by network operators such as TELUS and Shaw, but higher-margin, on demand services, including VOD, music downloads and other premium services will be owned by the content provider/distributor. Gartner Research estimates that "a content originator expects to retain 60 percent of end-customer revenue, with the remainder being split among those in the distribution chain, which would normally include an aggregator/distributor".³¹

³¹ Gartner Research: "Incumbent Network Operators Should Invest in Content Distribution to Grow Revenue" Dec 13, 2005. pg. 2.

Also in this medium term horizon are the alternative network providers that seek to deploy new, cheaper and more flexible networks that facilitate telecommunications in select areas. It is also likely that wireless and data growth will begin to approach maturity in this phase creating a situation where TELUS' primary growth areas will begin to slowly decline.

5.1.2.1 Strategic options – The fork in the road

The primary options open to TELUS in this phase are a) focus on its core network operator business or b) move into the content distribution and creation arena. Moving into the content arena holds significant opportunities, challenges and risks. Clearly, given the fact that TELUS has an established network infrastructure in place for distributing content, TELUS would, by cutting out distributors, be able to capture more high-margin revenue.

In order to become a significant player in this arena, given that TELUS currently does not have the internal capabilities required to compete effectively in this space, the only feasible way for TELUS to acquire these skills is through acquisition of content producer or aggregator. Even then, TELUS faces key challenges and gaps:

1. Leadership experience and focus

Given the significantly different competitive dynamics and leadership competencies required in this by this industry TELUS will need to restructure its leadership team. TELUS' current leadership structure (refer to Figure 27)

and expertise is built around providing network services. This structure will not adequately support a content distribution/creation business.

2. Financial structure and revenue model

TELUS will need the financial resources to be able to negotiate at the rights holder level — for example, major film studios, sports bodies and music publishers — rather than further down the food chain, and would need to invest in the systems, branding and marketing to package this content into a cohesive whole. Furthermore, production companies, publishing and other content type companies are not cheap. Given that TELUS' primary use of capital is for investing in network facilities and capabilities, TELUS will have to finance this type of expenditure with more debt or equity issue and it is unlikely that capital and equity markets will support this move given the risk, leverage required and the inevitable diffusion of focus from its core business.

The high margins accrued by content producers are indicative of the inherently high amount of risk that these firms must absorb. To absorb this type of risk, TELUS will need to significantly change its capital structure, particularly its debt and equity levels to be able to adequately manage the financial risks inherent in this business. TELUS could use a harvesting strategy to funnel resources from its network operations into this new line of business. While it is unlikely that TELUS will have to necessary resources to compete effectively with incumbents

in this area, this approach also jeopardizes TELUS' current "income stock" status and will most likely be received poorly by the investor community.

3. Operational capabilities

Another challenge of choosing this path is the need to balance the requirements of operating a network provider with those of a distribution and content ownership. These are completely different businesses with differing revenue models, business drivers and competencies. This will require significant changes in leadership and strategic competencies and organizational culture. Indeed, the longer term challenge for a company such as TELUS would be to find efficiencies and synergies from operating this type of an organization without diluting the overall performance of either one.

4. Culture

. TELUS' "high-performance" culture is essentially one whereby goals and objectives are cascaded down to subordinates to ensure alignment of activities and objectives. It would be very difficult to integrate this highly bureaucratic culture with a much more entrepreneurial one that relies on market knowledge, developing informal relationships, aggressive salesmanship and industry experience.

While TELUS can make selective acquisitions and investments in the content arena, the more natural approach, given its resources, culture and competencies, is to focus on its core business as a network provider. Much like the approach that Verizon is taking in retrenching into the access business by investing billions of dollars in delivering Fiber-to-the-home (FTTH), the alternative for TELUS is to remain focused on its network as its primary strategy for growth. In this strategy, TELUS would essentially seek to own the "last mile" to the customer by striving to become the most efficient, most economical and most convenient access services provider in the industry.

5.1.2.2 Critical Success criteria

As a network provider seeking to survive and grow in the content phase, the critical success factors for TELUS are as follows.

5.1.2.2.1 Cost management

TELUS will need to effectively manage infrastructure investment to maximize utilization of existing assets while also maximizing revenue generated by new assets. Balancing the significant investment required to deliver vastly superior network capabilities with the incremental revenue to be gained given competition from other incumbents and cable companies, as well as the, average revenue growth from increased bandwidth demand will be an increasingly critical differentiator as margins continue to erode.

Given TELUS' core competencies around network operations, planning and management, as well as, its capabilities around service provisioning; it should have the necessary resources to keep its plant as efficient as possible. Additionally, TELUS can also cut operating costs through workforce reduction and by leveraging relationships with vendors and suppliers to lower cost of equipment and transmission facilities.

5.1.2.2 Consolidation/Acquisition Planning

As network revenue and subscriber growth will certainly be flat over time, the most likely growth option open to TELUS will entail increasing its network footprint and capabilities through acquisition of other network providers. A particularly interesting potential in this area is partnering with or acquiring Broadband over Powerline (BPL) providers. BPL provides TELUS ubiquitous access to every home and complements its Future Friendly home strategy. It could also target other network providers that have not been able to reach the economies of scale and scope required to remain viable in this market such as niche providers, incumbents in central Canada such as MTS, and other complementary firms for acquisition to further increase its subscriber base.

The significant hurdle that TELUS faces in this approach are the regulatory bodies that will surely seek to limit further concentration in the industry.

In following this strategy, TELUS further entrenches itself as a pure-play network provider that differentiates itself on operational efficiency, reach and network capability which is a strategy that it has shown it can effectively execute. To the degree that it can become more efficient and more profitable than other network providers, it can also choose to selectively enter into arrangements with content distributors and owners to further differentiate its product sets and reap higher margins from content.

5.1.3 The personalization phase

The longer term implications stem from the fact that as the network becomes further abstracted from the applications using them and as network providers begin to converge to a common IP-based infrastructure, the service and content providers will begin to reach through the network and take ownership of the customer. In this phase, TELUS will have to compete with the likes of Google and Microsoft who will seek to own the customer through a comprehensive set of services and applications. In this phase, the choices and options open to consumers will be significantly different and more comprehensive than today. From a user perspective, customers will demand the same look and feel to their services whether they are delivered on a mobile handset, a TV connected to a set-top box or a PC connected to a broadband line.

5.1.3.1 Strategic Implications

The challenge for TELUS in this phase is to effectively differentiate itself from other network providers in order to minimize price competition. The options

open to TELUS in this phase is to position itself as the network and access provider of choice to application and content companies. It can do this by entering into partnerships, exclusive marketing and similar arrangements with either a Google or a Microsoft. Furthermore, it can take on the infrastructure and operations aspect of any network related endeavors that these companies are pursuing.

While it may be able to provide limited differentiation given its brand recognition, network reach and reliability, TELUS faces further commoditization of its services given the comprehensiveness and ubiquity of the services and content available from content providers.

An opportunity for TELUS in this phase is to pursue a personalization strategy whereby it leverages its knowledge of the local markets it serves to provide the "right content and applications on devices and access networks of choice, coupled with customer service that helps to dynamically map these closer to user needs."³² A utility model based on supplying services alone is not likely to address growing competition in the long term. Likewise value will be not be in content alone, but rather in the way it is personalized to a set of consumers. Indeed, success in this future phase will hinge on how well TELUS is able to understand customers and provide them with applications or, ultimately, experiences that are specific to their tastes.

In order to pursue this strategy, TELUS will need to effectively understand how to "own the customer". Given that this isn't a particularly high area of focus

³² Gartner Research: "Operators should embrace personalization and mobility". April, 2006. pg. 1

today, TELUS will need to significantly enhance its capabilities in this field. One option open to TELUS is to put together a single organizational area that is focused on customer insight and marketing. This team would have primary or shared responsibility for areas such as strategy development and execution, customer insight, product development, distribution channel management, public relations, marketing communications (including advertising and promotions) and market research with the objective of helping TELUS devise ways to effectively tailor products and services such that consumers will “prefer” TELUS branded services over those of a Google or Microsoft.

Nonetheless, even the most focused, most efficient network providers may simply not see enough growth to remain as viable stand-alone entities. Larger companies with the culture and the resources to match, who need network competencies may decide that the best way to maximize margins is to own and control distribution by acquiring companies such as TELUS. Given this, another option open to TELUS is to lobby for the relaxation of foreign investment currently governing the industry. This way it can merge with much larger communications firms such as Verizon, SBC or British Telecom who have the financial resources to effectively compete with the content and service providers.

5.2 Conclusion

From a strategic planning perspective, disruptive innovation poses significant challenges for several reasons. One is the fact that describing and quantifying the timeframe, impact and ultimate form that disruption will take is highly subjective and speculative. Another is that, it is extremely difficult, if not

impossible, to accurately plan for events that do not adhere to the normal competitive dynamics that govern the industry today or predict what entrants will do given their differing revenue models. Lastly, it is difficult to predict how other incumbents in the industry, regulatory bodies, consumers, vendors and other significant entities will react and respond to developments impacting the market.

Disruptive innovation describes a process by which technological and business innovations displace existing technologies and revenue models. Despite the theoretical framework, research and academic rigor that produced the theory, it is important to remember that it describes what is possible and not what is going to happen. In this respect, TELUS to the degree that it can effectively meet the key success factors crucial to succeeding in the changing telecommunications industry and the degree that it is able to focus its resources and harness its specific skills and competencies will determine what role TELUS will have in the communications domain of the future.

APPENDICES

APPENDIX A: CRTC MARKET PARTICIPANT DEFINITION

The following describes the CRTC's classification of providers in the Telecommunications industry.

Incumbents are the telephone companies that provided telecommunications services on a monopoly basis prior to the introduction of competition. The operating results of these companies from their activities outside their traditional operating territory are included with the competitor (ILEC out-of-territory) group discussed below.

- a) *Large Incumbents* are those incumbents serving relatively large serving areas, usually including both rural and urban populations, and providing local, long distance, wireless, Internet, data, private line and other services. The large incumbent companies include Aliant Telecom, Bell Canada, MTS Allstream, SaskTel and TCI, as well as Northwestel Inc. (Northwestel), Télébec, and TCQ.

- b) *Small Incumbents* are those incumbents serving relatively small serving areas (mostly municipal areas generally located in less densely populated areas) in Ontario, Quebec and, in one instance, British Columbia. Due to the limited size of their serving areas, they typically do not provide facilities-based long distance services. However, they do provide a range of local voice, data, Internet

and wireless services. The small incumbents include companies such as NorthernTel, Limited Partnership and TBayTel.

Competitors are providers of telecommunications services that are not incumbent telephone companies discussed in (1) above. However, this group includes incumbent companies operating outside their traditional operating territory such as Navigata. Competitors are subdivided as follows:

a) Competitors (ILEC out-of-territory) are the incumbent companies operating outside their traditional operating territory. This includes both subsidiaries and divisions of the incumbents providing telecommunications services outside their traditional operating territory such as TCI's operations in Ontario.

b) Competitors (other) are providers of telecommunications services that are not incumbent telephone companies.

i. *Facilities-based competitive service providers* are those competitive service providers that own physical transmission facilities (e.g., inter-city, intra-city, or local). These service providers include such companies as Call-Net Enterprises Inc. (now Rogers Telecom Holdings Inc. (Rogers Holdings)) and FCI Broadband (a division of Futureway Communications Inc.)

ii. *Resellers* are non-facilities-based competitive service providers. These service providers include Primus Telecommunications Canada Inc., Distributel Communications Limited, YAK

Communications (Canada) Inc., and many others, including independent Internet service providers (ISPs).

- III. *Competitive Pay Telephone Service Providers (CPTSPs)* are competitive service providers that provide public telecommunications services by way of pay telephones.
- IV. *Cable service providers* are the former cable monopolies that also provide telecommunications services (e.g., Internet, wireless and voice). These cable service providers include such companies as Rogers Communications Inc. (Rogers), Shaw Communications Inc. (Shaw), Le Groupe Vidéotron ltée, Cogeco Inc. and Bragg Communications Incorporated (EastLink).
- V. *Utility telcos* are service providers whose market entry into telecommunications services, or whose corporate group's market entry into telecommunications services, was preceded by a group-member company's activity in the electricity, gas or other utility business. These service providers include such companies as Hydro One Telecom Inc., Toronto Hydro Telecom Inc. and FibreWired Network.

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