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Broadband Lite Blossoms: Whither the “Visionary Gleam”?

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*Whither is fled the visionary gleam?
Where is it now, the glory and the dream?*

- William Wordsworth

***Ode: Intimations of Immortality on
Recollections of Early Childhood***

Once upon a time broadband meant a cornucopia of services delivered via telecommunications, from frivolities like online video games to vital services like tele-medicine, which enables prevention, and remote diagnosis, of disease. Computer science polymath David Gelernter looked towards “the day software puts the universe in a shoebox”—“mirror worlds” in which multi-dimensional virtual space becomes available over vast networks to all users.¹ Torrents of data—rich visual images bursting with millions of colors, animation and rapid motion, as deep as wide—would be available to all.

Today there is one country where the foundation for that “visionary gleam” is being laid. Not the United States, birthplace of the modern electronic digital computer, the Internet and much more – try the Republic of (South) Korea. Animated avatars and all, Korea leads the world, with over half its population having true high-speed broadband access—defining “true” broadband as at least T-1 access speed, *i.e.*, 1.5 megabits per second (Mb/s). Meanwhile, Uncle Sam’s citizens get by with what is best termed “Broadband Lite”: slightly faster web page downloads and minimum-quality video streaming. No glory, no dream.

Recent reports compiled by the Federal Communications Commission and Nielsen/NetRatings provide ammunition to those supporting present broadband policy. But are we losing the race for REAL broadband?

FCC: Are the Bells at Long Last Ringing?

The latest figures compiled by the FCC show 19.9 million Americans now using broadband to access the Internet, with 87 percent (17.4 million) of users either residential or small business customers. This is a 55 percent increase over year-end 2001. Even more rapid was the increase in bi-directional broadband (“advanced services”), which jumped 75 percent in 2002, closing the year at 13 million, or 65 percent of total broadband subscribership (of which 10.8 million, or 83 percent, served residences or small businesses).

At least one broadband provider is present in all fifty states, the District of Columbia, Puerto Rico, and the Virgin Islands, with 88 percent of US ZIP codes covered.² Multiple providers serve 71 percent of the nation’s ZIP code areas.³ In all, 99 percent of the population has access to at least one broadband provider.⁴

Cable continued to lead inter-industry competition by a wide margin, albeit slightly less wide than at year-end 2001. However, cable added more lines, as it grew from a much larger base. Digital Subscriber Line (DSL) service increased 64 percent in 2002, from 3.9 to 6.5 million, while cable modem service rose 61 percent, from 7.1 to 11.4 million lines; both types of service grew slightly more slowly in the second half of 2002 than in the first. DSL advanced service rose 105 percent in 2002, versus 90 percent for the cable variety.⁵ Thus, cable added 4.3 million lines, versus DSL’s 2.6 million, a 65 percent greater arithmetic increase. Phone-company DSL accounted for 95 percent of facilities-based DSL lines, and 74 percent of all wireline DSL, the latter figure reflecting DSL providers using phone company network lines. But local carriers have only a 36 percent share of total broadband service provided over all types of transmission media.⁶

The 2002 broadband numbers are less impressive than those for 2001, when lines in service grew from 7.1 to 12.8 million, an 80 percent jump. Cable modem links nearly doubled, from 3.6 to 7.1 million, as did DSL, from 2 to 3.9 million.⁷ And 2001's figures were, in turn, more modest than those for 2000, when high-speed lines grew 158 percent, with DSL soaring 435 percent and cable modem lines increasing by 153 percent.⁸ DSL's jump was from a base under 500,000 lines. Thus DSL began rapid growth in 2000, lagging cable modem by two years.

Bell DSL growth was sufficiently vigorous in 2002 to lend support to arguments that the FCC's regulatory policies have not discouraged broadband investment. Add to that trade association numbers showing \$7 billion broadband equipment investment in 2001, \$11 billion in 2002 and \$16 billion in 2003.⁹ It is hard to square Bell complaints about regulatory policy with a more-than-doubling of broadband equipment investment in just two years. But not impossible.

Or Are the Bells Being Rung?

Bell DSL took off in the past three years. Why? Because the service became profitable? Hardly. *Bell-provided DSL took off because, beginning in 2000, the Bells started to lose core customer access lines, and new service became an essential customer retention device.* The year 2000 saw the first local company access line decline since the Great Depression. Three years running (2000 - 2002) the Bells have lost access lines—chiefly their upscale customers, the ones they make money on. DSL yields the Bells little money, but providing DSL to customers improves retention. *This does not mean that the FCC's broadband regulatory policies were fair or reasonable for the Bells; it means that crumbling core revenues forced the Bells to offer new services to profitable customers, lest they lose those and be left only*

with unprofitable market segments ignored by rivals.

The drive to bundle has led SBC and Qwest to make marketing deals with satellite provider EchoStar, so as to add broadband video to the mix of services the phone firms can offer customers. DSL simply does not suffice for video. (Bell Atlantic unveiled first-generation DSL in 1993, intending to provide video-over-copper to its customers, which belies the notion that the Bells sat on DSL. The offering failed, and DSL had to await Internet access for a market opening.)

From Not-So-Narrow to Not-So-Broad

Complementing the FCC's report, Nielsen/NetRatings reports that broadband subscriber-ship, 33.6 million at year-end 2002, has risen to 39 million as of May 2003, a 16 percent jump. Narrowband users stand at 69.6 million, or 64 percent of the total. But year-over-year (*i.e.*, YoY from May 2002 to May 2003) broadband users have increased 49 percent, while narrowband users declined 12 percent. Seniors are the fastest growing broadband user social segment group, up 64 percent YoY to 1.7 million, while student users are the largest such group, up 51 percent YoY to 7.8 million (almost equal to the 8.1 million users with incomes topping \$75,000).¹⁰

But consider what the FCC calls “broadband”: services provided at more than 200 kilobits-per-second in one-direction (usually “downstream,” *i.e.*, from the provider to the customer's premises); “advanced services” are those with bi-directional speeds greater than the 200-kilobit benchmark.¹¹ Such speed represents but *four* times the access speed for dial-up service—akin to the speed differential between walking and jogging. Call it *Broadband Lite*. To see what *real* broadband looks like it is necessary to turn to the Korean market.

ROK Rocks: Can Broadband Supercharge US GDP?

A *Forbes* article supplies abundant evidence that Korea's 46 million people are going bonkers over broadband. Already, 70 percent of Korean households—11 million—have a broadband connection. Two-thirds of Korean mobile users take 3G service, which runs at 384 kilobits-per-second (kb/s): ten times the 38.4 kb/s speeds for US wireless online users. A nationwide 2.4 Mb/s wireless Internet service is also in the works.

Because Korean landline broadband runs at 8 Mb/s, video applications have taken off. Korea hosts the world's largest online gaming network, with 3.2 million subscribers paying \$25/month; top professional players in a Korean professional video game league earn \$150,000 annually. Online video chat rooms serve 1 million (text chat serves 10 million), while avatars (animated on-screen icons) not only serve over 3.6 million users, but can be prettied up—not a joke—by virtual online plastic surgery. Online banking, shopping, investment and even tax-paying have outstripped old economy usage. (Even the underworld has gone video, paralleling the rise of video porn when VCRs exploded: all prostitution in the country is Internet-based.¹²)

The burgeoning array of high-speed video services Koreans enjoy would overstuff America's crimped broadband pipes. Korea's 8 Mb/s links run (fiber) rings around typical real-world US speeds of some 500 kb/s. But the primary benefits of Korean broadband pre-eminence lie in attracting foreign investment and supercharging Korean economic growth. *Forbes* reports that at least 80 companies have established broadband

research ventures in Korea. Already, e-commerce accounts for \$150 billion—30 percent of Korean GDP.¹³

Extrapolating Korea's figures to the US would yield a \$3.2 to \$3.5 trillion share of year-end 2002's \$10.75 trillion GDP. US GDP today includes very little broadband contribution; nationwide broadband that added 30 percent to US GDP total would add trillions to US economic growth. Three factors could alter these numbers, perhaps significantly. First, demographic and cultural factors may make linear extrapolation inaccurate. Second, the vast geographic expanse of America stands in stark contrast to Korea, where half the entire population resides in the Seoul metropolitan area. And third, to the extent that broadband applications displace narrowband online, or old economy offline, those business losses would amount to a negative offset against gains from broadband growth. It seems intuitively likely, however, that the benefits of widespread broadband diffusion would prove substantial, surely greater than the cost of nationwide fiber-optic local network build-out, which Verizon Chairman/CEO Ivan Seidenberg estimated earlier this year would run \$128 billion. Were broadband even to provide *one-tenth* the GDP boost it has given Korea, it would still be almost triple the cost of "fiberling" America's local loop.

It is this potential supercharging of domestic economic GDP that FCC broadband policy has retarded since passage of the 1996 Telecom Act, by forcing below-cost network sharing on disfavored firms, harming even favored firms by artificially inflating the number of market entrants, and imposing draconian conditions upon local carriers as preconditions to granting merger approvals.

Conclusion

Solid Broadband Lite growth simply does not translate into a healthy industry climate. Regulators—at least, the more astute among them—know perfectly well that the emerging telecom market will take no prisoners.

Thus, in a recent interview, FCC Chairman Michael Powell warned that technology upheaval threatens the survival of every telecom company:

I personally don't think anybody is safe. I don't believe any company currently in telecommunications is so well-structured and tied down that they are guaranteed to be here 15 years from now....Kids can still come out of a garage with something that blows the pants off of [Verizon Chairman/CEO] Ivan Seidenberg....If anybody doubts that big companies can find themselves wiped out, we can go through the history of disrupting technologies [and] a long list of companies once thought invincible.¹⁴

The long-playing record gave way to the CD, as now the VCR gives way to the DVD. Narrow-band gives way to Broadband Lite. To the extent that technology and market demand drives these shifts the marketplace verdict should be accepted. The rapid diffusion of Broadband Lite—only DVD and the CD have been faster—absolves regulators of the charge that they have flatly sty-

mied broadband deployment. But that their policies have hampered some to the benefit of others is equally clear. While the cable industry shifts into overdrive, telephone companies struggle to surmount regulatory obstacles and absorb financial losses to keep customers from whom they make money selling other services.

In what is truly exquisite irony, bundling has come full circle: Long feared by regulators as a way for large integrated firms to hide a multitude of financial and market sins, bundling now provides regulators with cover for their sins—favoring particular competitors. The disadvantaged phone companies have little choice but to deploy no-profit new services so as to hang on to valued core customers.

All this has the flavor of fiddling while Rome burns. Korea leads the world in Real Broadband, while American firms fight to the finish over Broadband Lite. Removing regulatory barriers to deployment of optical fiber in phone company networks is a vital step in promoting eventual diffusion of the real thing in the US.

The final version of the FCC's new broadband policy, released in draft form in February, will be the focus of an upcoming issue of *Bandwidth*, after the order's eventual release from Regulatory Agency Purgatory. Its implications for Broadband Lite and Real Broadband will be the focus. Will the "visionary gleam" and "the glory and the dream" return to American telecom policy? Stay tuned.

[ET CETERA]

MCI, as in More Charges Incoming? The U.S. Attorney for the Southern District of New York (the top federal proecutor office in the country) is investigating charges that the company has defrauded SBC, Verizon and AT&T since 1994, by re-routing calls to disguise their points of origin, and thus avoid paying access fees otherwise due. The total amount of avoided charges could exceed \$1 billion. Information provided by company whistleblowers (interviews and internal documents) led the office to issue a subpoena; the company denies the charges. One technique allegedly used was for MIC to route calls to Bell networks via small independent carriers whose traffic was local and thus not metered; another allegation asserts that traffic was routed via small carriers in Canada. If proven, such charges could provide further evidence of want of “good character” and “a pattern of deliberate misrepresentation,” each grounds for revocation of FCC radio licenses.¹⁵

Mobility on the Move. The year 2002 saw the first decline in desktop PC ownership ever, while mobile appliances—laptops, cell-phones, digital cameras—continued to spread. PC households fell from 56 percent in 2001 to 54 percent in 2002, a drop slightly less than the rise of household penetration of laptops, from 11 to 14 percent. Cell-phone population penetration rose from 45 to 48 percent, and digital cameras from 17 to 21 percent of households.¹⁶ The diffusion of mobile devices will drive customer demand towards mobile applications.

Iranian Voices Speak Over the Internet. An e-mail sent from Shiraz, Iran, to the office of Senator Sam Brownback (R-KS), sponsor of the Iran Democracy Act, which would fund Iranian pro-democracy groups with \$50 million, closes by telling the Senator: “You are, after Mr. President Bush, the most popular man of America in Iran now. Mr. Senator, please do [something]....”¹⁷

DVD Rules the Roost. DVD rentals (28.2 million) topped VHS (27.3 million) for the first time in the second week of June. Annual VHS rentals peaked at 2.6 billion in 2000, slipped slightly to 2.55 billion in 2001, and then in 2002 fell off the table, down to 2.02 billion. DVD rentals, in the meantime, trebled from 168 million in 2000 (6.5% of VHS total) to 445 million in 2001 (17.5%), then doubled again, to 915 million in 2002 (45.3%). If that rate for DVD rental is maintained it will mean over 700 million for the second half of 2003 alone. It thus seems likely that if total DVD rentals do not surpass VHS this year, they will do so come 2004. Already, at Blockbuster DVD rentals were 53 percent share in 1Q03, up 20 percent YoY (over 1Q02); 4,500 of the chain’s 9,100 titles are DVD. Netflix leads the online DVD rental market, at 2 million customers and 15,000 titles. DVD player ownership hit the 50 million milestone in five years, half the time it took VHS to do so; key factors have been steep price cuts and the bonus features added to DVDs—outtakes, how the movie was made, interviews, etc.¹⁸ Netflix has just been granted a broad patent for its subscriber system, which may give it a big edge in grabbing more of the video-plus-DVD rental market.¹⁹ Meantime, VCR homes, which peaked at 90 percent penetration in 2000, fell to 85 percent in 2001 and then dropped literally off the table, to 61 percent in 2002.²⁰

Chocolate DVDs? Walt Disney’s home video division will test-market a DVD that self-destructs 48 hours after the package is opened. At \$10.25 billion, home video was 59 percent of Hollywood’s \$17.38 billion total 2002 revenues; late returns are 10 percent of video store revenues, but do not send dollars to the studios. The concept was tried in 1998, without success. Limited-play DVDs will compete with video store online rental offerings. The DVDs are fabricated from a Lexan resin copolymer (do not even ask).²¹ Next: Hershey chocolate DVDs?

HDTV Rising. Fox announced plans to broadcast half its prime-time lineup in HDTV format by the 2004 season. Only one million HDTV set-top

converters are in homes so far. But there are 5.8 million sets that are now HDTV-capable, according to the Consumer Electronics Association; CEA estimates that by year-end another 3 million HDTV-capable sets will be sold. Currently, 20 percent of HDTV programming is carried on cable; Forrester Research estimates another 6 percent of users have erected antenna to receive digital broadcast programs, but many of these are not in HDTV-format.²²

Phone-Spam Slam-Dunk. On June 27 the Federal Trade Commission began taking anti-telemarketer “do not call” requests from consumers. Online applications totaled 735,000 between 12:01 AM and 5 PM. By noon the website was swamped, and outbound e-mail notices were stalled. Website maven ComScore Networks clocked the increase in FTC server response going from 1.8 to 8.5 seconds. Online completion percentage by midday had fallen to 77 percent from 92 percent in the morning.²³ Interestingly, 9 of 10 signers-on did so online, despite the rule being aimed at *phone* marketing.²⁴ Online spammers, don’t laugh, you’re next. Businesses are not amused: One estimate pegs annual spam-related business expense at \$10 billion.²⁵ (To be fair, the Direct Marketing Association, the telemarketer trade lobby, estimates that 32 percent of those called in the past twelve months made at least one purchase.²⁶)

Spam Slam Double-Whammy. Long distance carriers face spam-call withdrawal pangs, too. Traffic and revenue shrinkage could be substantial. The Direct Marketing Association estimates that spam-calls total 83 to 104 million calls daily—using the mid-range figure gives one-third of one *trillion* calls annually. FCC data suggest that phone-spam is 30 to 40 percent of LD calling volume (only 5 to 6 percent of total volume). A Bank of America analyst puts business call volume losses at 5 percent. Because marketing call duration is likely less than normal calls, the revenue impact is unclear, except that it cannot be positive for a sector already under siege due to the telecom collapse.²⁷

Spam Switch? Telemarketers have taken note of the signup avalanche at the FTC: 12.5 million phone numbers registered in the first four days, plus 14 million numbers to be automatically transferred from state “do-not-call” lists. The FTC estimates that eventually 60 million numbers will be registered for what has to be the most popular government program since Social Security. The \$80.3 billion industry in 2002, anticipating \$104.8 billion by 2006, now faces 2 million layoffs out of 6.5 million workers. Does anyone think they will “go quietly into that gentle night”? Already, some telemarketers are signing up in-bound call centers, to pitch captive callers (go ahead, hang up and skip making your reservation). Others plan to add to the 2,278 spam messages the average online user already gets.²⁸ The popularity of the FTC’s Do-Not-Call Registry (a running tally of signers is on the FTC’s homepage—as of July 23, 28 million had signed up—80 percent online, the rest by phone) is increasing pressure for a similar registry for spam. FTC Chairman Timothy J. Muris initially opposed this, citing administrative difficulties of tracking multiple, changing addresses (happens with phones, too) and the risk that hackers will steal the list (a real threat); a possible solution to the hacker threat would be encrypting e-mail registry addresses.²⁹ Muris has since met with anti-spam groups, and now says creation of a “Do-Not-Spam” registry is technically feasible. A new poll shows that 75 percent of Internet users support the idea; most Internet users also oppose an “opt-out” rule, because it means giving one’s e-mail address to spammers.³⁰

Pay Up or Shut Up? One anti-spammer seeks a patent for a system (titled *Vanquish*) that would require e-mail users to post a nickel bond electronically for each message sent. If the target recipient accepts, the bond is released, but users who refuse to post a bond have their messages blocked. Rejected messages cost the sender the nickel, with four cents going to the service provider and one cent to the software vendor; current estimates place spam at nearly 7 *billion* messages daily. This would mean \$350 million daily in posted e-mail bonds. If spam remains 40 percent of all e-mail

traffic, this would lead to forfeiture of \$140 million daily, or roughly \$51 billion annually. That figure would exceed the annual revenues of the cable industry.³¹ (Anti-spam firms sold \$120 million of their wares in 2002; one forecast sees this rising to \$750 million by 2007.³²)

Online Movin' On Up. By year-end 2002, 41 percent of Americans had gotten news online—roughly 7 out of 10 of the 58 percent of the population who have gone online. One estimate breaks down the 42 percent offline set into 24 percent “truly disconnected,” 10 percent “Net dropouts” who had been online but quit, and 8 percent “Net evaders” who live in houses with PCs but do not go online.³³

Can't Do Without It. The Pew Internet & American Life Project surveyed people as to what media appliances they would find very or somewhat hard to give up. The “I need it” rankings: telephones, 81%; TV, 69%; cable, 50%; PC, 45%; newspaper, 40%; cellphone, 35%; personal digital assistant (PDA), 13%.³⁴

Google Goes Global. In three years daily Google searches have doubled, to 200 million, while daily Verisign domain requests (defined as any .com or .net query) have jumped 15-fold, to 9 billion. Two-thirds of Google searches are launched outside the US, using 88 foreign languages.³⁵

Digital Delinquency. Japanese shoplifters have gone digital. Using digital cameras built into cell-phones they photograph magazine pictures, taking advantage of the generous allowance Japanese merchants make for store patrons who browse magazines at leisure.³⁶

Wi-Fi World. Gartner Dataquest counted 14,753 Wi-Fi “hot-spots” at year-end 2002, and estimates that the figure will quintuple in 2003 to 71,078 and then nearly double in 2004 to 132,486. Retail outlets now hold the lion's share at 75 percent, a figure Gartner estimates will fall to 62 percent in 2004. By far the fastest growing sector will be so-called community hot-spots (2% now, est. 16% in '04).³⁷

Africa Lift-Off? Communications connectivity is exceedingly limited in Africa. But VoIP (Voice over Internet Protocol) technology is spurring grassroots growth of telecom infrastructure, a phenomenon that places private entrepreneurs at odds with governments, which run state telephone companies. In Ghana the government imprisoned Internet providers, only to see them freed by the courts. Ghana has 19 million people but only 750,000 phone connections, two-thirds of which are wireless, a huge jump from only 200,000 lines just four years ago. Businesses pay \$2,000 - \$5,000 per month for an Internet connection—5 to 12.5 times the country's \$400 per capita GDP; a US equivalent rate, given a \$37,000 per capita GDP, would be \$185,000 - \$462,500 monthly per business.³⁸

Video Vacuum. College students devour video games: 70 percent play online, 48 percent say the pastime keeps them from studying at least “some,” and 32 percent confess that they have indulged in online recreation during class.³⁹

Hacker Super Bowl Fizzles. A hackers website (defacers-challenge.com) ran a six-hour global website takedown contest on July 6, based upon points for various types of harm inflicted. The winner was to receive 500 megabytes of free Web storage space. Many hackers avoided the contest, calling them “packet kiddies”—hacker-speak for inexperienced or reckless hackers. The harm done seems to have been far short of the organizers' hopes.⁴⁰

Happy Haptics? Last fall *Bandwidth* noted that the first trans-oceanic Internet “handshake” had been accomplished. A “haptic” interface—one defined by touch sensation—made this possible. Comes next virtual reality “sympathetic haptics”: simultaneous online user sensations. Researchers at the University of Buffalo Virtual Reality Lab believe investing \$15 million will yield a prototype in 3 years; with a computer model of the human body, replication of actual contact will, they believe, be possible. The prospects include realistic virtual telemedicine, games and, yes, virtual sex as well.

Remember, porno flicks drove VCR home use....⁴¹

Cyber-Crime Watch. The Australian High-Tech Crime Centre (*sic*) has just launched a website to log online reports of electronic crimes, defined to include both attacks against computers (*e.g.*, hacking) and other crimes facilitated by using computers (*e.g.*, child sexual exploitation). The AHTCC was formed to coordinate efforts by Down Under's federal, state and local authorities.⁴²⁻

¹ Gelernter, David, *Mirror Worlds* (Oxford University Press 1991).

² *High-Speed Services for Internet Access: Status as of December 31, 2002*, Industry Analysis and Technology Division, Wireline Competition Bureau, p. 2 (June 2003).

< <http://www.fcc.gov/wcb/iatd/comp.html> >

³ *Id.*, p. 4.

⁴ *Id.*

⁵ *Federal Communications Commission Releases Data on High-Speed Services for Internet Access*, *FCC News*, (June 10, 2003).

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⁶ *High-Speed Services*, note 2 *supra*, p. 3.

⁷ *Federal Communications Commission Releases Data on High-Speed Services for Internet Access*, *FCC News* (July 23, 2002).

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⁹ *Some Bet that Broadband Belongs to the Bells*, *New York Times*, p. C1 (July 21, 2003).

¹⁰ Source: Nielsen/NetRatings. < http://www.nielsen-netratings.com/pr/pr_030618_us.pdf >

¹¹ *Id.*, p. 1.

¹² *Korea's Weird Wired World*, *Forbes*, p. 92 (July 21, 2003).

¹³ *Id.*

¹⁴ *FCC Chief Sees Upsets for the Giants*, *Washington Times*, p. A1 (July 8, 2003).

¹⁵ *MCI Faces Inquiry on Fees for Long Distance*, *New York Times*, p. 1 (July 27, 2003).

¹⁶ Source: The Yankee Group.

¹⁷ *U.S. Warns Iran Not to Pursue Nukes*, *washtimes.com* (6/19/03).

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¹⁸ *It's Unreel: DVD Rentals Overtake Videocassettes*, *washtimes.com* (6/20/03).

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¹⁹ *Netflix's Patent May Reshape DVD-Rental Market*, *New York Times*, p. C4 (June 26, 2003). This article pegs Netflix's subscriber total at 1.1 million, versus 2 million in the Washington Times piece.

²⁰ Source: Yankee Group.

²¹ *DVDs Meant for Buying But Not For Keeping*,

New York Times, p. C1 (July 21, 2003). Other Hollywood revenue sources: theaters, \$4.1B (24%); pay TV, \$1.4B (8%); free TV, \$1.2B (7%); other, \$0.4B (2%). Source: Adams Media Research.

²² *Fox, In Shift, to Join Other Networks in Offering High-Definition TV*, New York Times, p. C5 (June 25, 2003).

²³ *National Do-Not-Call Registry Overwhelmed By Eager Public*, New York Times, p. B2 (June 28, 2003).

²⁴ *Phone Registration Opens For Do-Not-Call List*, Washington Times, p. A4 (June 6, 2003).

²⁵ *Spam Sets Back Businesses by Billions*, Washington Times, p. C9 (July 9, 2003).

²⁶ *Feelings Mixed, Millions Enroll to Block Calls*, New York Times, p. A1 (July 10, 2003).

²⁷ Source: Dow Jones Newswires, 7/7/03.

²⁸ *'Do Not Call' Registry is Pushing Telemarketers to Plan New Pitches*, Wall Street Journal, p. A1 (July 2, 2003). Sources: Telemarketing numbers from Direct Marketing Association; spam figure from Jupiter Research.

²⁹ *Waiting for Muris to Opt In*, Washington Post, p. E1 (July 10, 2003).

³⁰ *FTC Ironing Out 'Do Not Spam' Registry Details*, Washington Times, p. C9 (July 24, 2003).

³¹ *Pay Up!*, Forbes (July 7, 2003). (Page number not given.)

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³⁴ *Id.*

³⁵ Thomas Friedman, *Is Google God?*, New York Times, sec. 4, p. 13 (June 29, 2003).

³⁶ *Japan's New Era of Digital Shoplifting*, smh.com.au, 7/1/03.

< <http://www.smh.com.au/articles/2003/06/30/1056825337737.html> >

³⁷ *All Access*, Wall Street Journal, p. A3 (July 1, 2003).

³⁸ *Searching for a Dial Tone in Africa*, New York Times, p. B1 (July 5, 2003).

³⁹ *A New Youth Culture Forms Around Video Games*, Washington Times, p. A2 (July 7, 2003).

⁴⁰ *Hacker Contest Leaves Little Damage*, Washington Times, p. C13 (July 7, 2003).

⁴¹ *Net to Get All Touchy Feely*, New York Post, p. 3 (June 24, 2003).

⁴² The AHTCC website: < <http://www.ahtcc.gov.au/> >.

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