Chapter 4

Seven Unknowns

> Only two general truths emerge from the study of history. One is that things tend to change much more, and more quickly, than one might think. The other is that they tend to change much less, and more slowly, than one might think. Both truths tend to be exemplified in any specific historical situation. And so, for good and ill, we shall always find what happens somewhat surprising.
>
> - J. M. Roberts[1]

The road ahead can be changed by many unknowns and surprises, seven of which I want to discuss in this chapter. Each, depending upon the answer, can create new pathways and opportunities. J. M. Roberts broad cautionary advice (above) notwithstanding, here are the seven:

1.) Unanticipated changes and tradeoffs;

2.) Telepresence;

3.) The future of advertising;

4.) The nature of entertainment;

5.) The organization of work;

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[1] J. M. Roberts, *The Pelican History of the World*, Revised. ed. (New York: Pelican, 1983) 1019.

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6.) Generational effects;

7.) The nature of human nature.

1.) Unanticipated changes and tradeoffs

> There is always a tradeoff between what the Web offers and what it takes away.
>
> - Hubert Dreyfus [2]

Hubert Dreyfus poses an interesting question: What will the Web take away? The answer may live in our present, still unrecognized. The owl of Minerva, in Hegel s allusion to wisdom and change, may take to wing only as the shades of night are falling. For example:

A. The End of the Mass Communications Experiment

As we enter a future, we leave a present and a past that have shaped us, perhaps profoundly. We are leaving the extraordinary and unique era of mass communications during which two-thirds of the American people were exposed, often 5-6+ hours/day, to a similar stream of messages, images, and values from three nearly-uniform sources (ABC, NBC, CBS). Even with the expansion of cable television, the options (of sitcoms, sports, movies, news, shopping, etc.) also have been typically designed to maximize revenue from mass markets and have been remarkable similar: it would be difficult to tell most broadcast or cable channels from their

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[2] Hubert L. Dreyfus, *On the Internet*, ed. Simon Critchley and Richard Kearney, *Thinking in Action* (New York: Routledge, 2001) 90.

competitors.[3]

Never before in history have such mass communication societies existed; the experiment probably will never be repeated. [4] [5]

The era of mass communications coincided with the rise of the Imperial Presidency and the bold global drama of the Cold War. And with an astonishing acceleration of politics (e.g., Black, Women s and Gay liberation; the environmental and consumer s movement; an initial passion for government activism in the Great Society and an equivalently rapid reversal of the Reagan Revolution and deregulation.) People became more mobile and willing to move to different parts of the country for jobs. It was an era, too, when regional and local differences in culture seemed to disappear - and the dialect of American English spoken on each national television network was standardized as Midwestern. Were these phenomena helped by mass communications? And - next - what changes will occur?

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[3] At least one television in an American household was turned on for about 7 ½ hours/day at the end of the 20th century, more than 1 hour/day higher than during the 1970s. Of this, children watch about 3 hours/day. John W. Wright, ed., *The New York Times Almanac 2002* (New York: Penguin, 2001) 395.

[4] Ithiel de Sola Pool, *Technologies of Freedom* (Cambridge, MA: Belknap Press, 1983) 270.

[5] The political scientist Robert Putnam argues in his book Bowling Alone that the hours spent watching television have produced a decline in local communities and civic engagement: Robert D. Putnam, *Bowling Alone: The Collapse and Revival of American Community* (New York: Simon and Schuster, 2000).

B. Other Unknown Tradeoffs

Not long ago, a family of the North lived in a fine clapboard house. There was a chimney at the heart of it, and to keep in the warmth the walls formed a simple surrounding box. In the winter, family members gathered round the fireplace - which was the only source of heat and light. Here, the children studied, the parents exchanged news of the day, and Grandma worked at her embroidery. The hearth held the extended family together.

Then, pipes for delivering energy were put in - electrical wiring and central heating ducts. Family members could be warm and have light to read by everywhere. The fire was no longer kindled, except as a kind of nostalgic entertainment on festive occasions. The kids withdrew to their rooms to do their homework and listen to their stereos, The parents began to work different shifts, and would leave testy notes for each other on the refrigerator door. Grandma got bored and cranky, and soon moved out to an air-conditioned nursing home near Phoenix where she could play bingo with her similarly sidelined cronies. The fireside circle could no longer serve as social glue.

Informatization is following hard on the heels of electrification, with social consequences that are at least as profound . . . today, ubiquitously present telecommunications networks, smart machines, and intelligent buildings combine with water supply and waste removal, energy distribution, and transportation

> systems to create a wherever, whenever, globally interlinked world. The old social fabric - tied together by enforced commonalities of location and schedule - no longer coheres.
>
> What shall replace it?
>
> - William L. Mitchell[6]

- About other unknown tradeoffs: It is impossible to read some super-hyped imagining about the new era without wondering whether we or society will truly become wiser or happier. George Gilder, for example, imagines dozens of things that he will accomplish within an hour.[7] We may seek speed and quantity when the real loss is quality. Do we want to download thousands of MP3 music files or a bit more music that communicates and engages our lives? Can we stop and think, step-back, and design more wisely, even if what is starting to disappear is at first elusive?[8] And can we, as William Mitchell asks in his thoughtful study, e-topia (quoted, above) compensate for the loss of the old enforced commonalities?

2.) Telepresence

Today, we envision the new video Internet as if it is television because it cannot create the elusive experience of telepresence -

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[6] William J. Mitchell, *E-Topia: "Urban Life, Jim - but Not as We Know It"* (Cambridge, MA: MIT Press, 2000) 4-5.

[7] George Gilder, *Telecosm: How Infinite Bandwidth Will Revolutionize Our World* (New York: Free Press, 2000) 246-52.

[8] See also: Todd Gitlin, *Media Unlimited: How the Torrent of Images and Sounds Overwhelms Our Lives* (New York: Henry Holt and Company, 2001).

for example, the ability to make eye contact or to establish a relationship.

This limits distance learning, to give one example. Distance learning has been an important adjunct to the world s educational systems since the early days of correspondence courses. Lectures can be delivered over television and Internet television. However, for most education, human relationships are important - the relationship with the teacher is not merely an anachronism made obsolete by new technology, but a critical component in student motivation at most levels. In liberal arts education, the opportunity to write papers, to have them read by teachers, and to discuss ideas with others, plays an important role.[9]

Telepresence could change the distance learning equation. It also can make business videoconferencing routine - and superior to telephone calls - as a way to do business. It could strengthen relationships: parents connecting to kids in day care or elderly relatives at a nursing home or at a physical distance; school kids doing homework together; perhaps even master classes or musicians collaborating. It could make telecommuting more widespread. And support many other applications.[10]

Telepresence also can revolutionize the entertainment industry.

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[9] For an extended discussion: Dreyfus, *On the Internet*. David Winter, Abigail Stewart, and David McClelland, *A New Case for the Liberal Arts* (San Francisco: Jossey-Bass, 1981).

[10] National Science and Telecommunications Board, *Broadband: Bringing Home the Bits* (Washington, DC: National Research Council, 2002) 104.

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Audiophiles spend thousands of dollars to create a real performance via electronics, although the technology does not yet achieve the experience of having Yo-Yo Ma in the room. The energy and immediacy that take people to the live theater, or to hear live music, might also be available via a new generation of telepresence television or via augmented virtual reality devices (a technology that evolved from the head-mounted displays and tracking systems developed in the 1960s to train pilots.) Or it could be a large public system, with a large video or holographic display, and make games and sporting events more exciting as a social event with friends.

Stay tuned.

3.) Advertising

> Economic realities exist, and we do not begrudge our national broadcast partners their right to make money. Nevertheless, we are alarmed about the continuing deterioration of the TV environment caused by increasing the number of distracting elements in prime time. More restraint would be most welcome.
>
> - Clutter Watch (2002)[11]

There will be more advertising in the future. The Information Age is already becoming The Age of Too Much Advertising.

Astronomers tell us that there are key numbers, related to the amount of dark matter in the universe, that will determine whether

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[11] Louis Chunovic, "TV Clutter Reaches All-Time High," *Electronic Media*, March 11 2002.

the universe expands forever or the expansion will reverse to create another Big Bang and cycle of expansion. Similar (unknown) numbers concerning advertising economics will shape the future of cyberspace. If, for example, advertising dollars are fixed and the multiplication of new channels and other media simply divides the fixed pie into increasingly smaller portions, the quality of everything supported by advertising revenue may decline.[12]

Many of the Internet s best sustainable features (free portals/Web sites like Yahoo and free search engines) are supported by advertising. So, too, are broadcast television, radio, and part of cable television.

The profitability of newspapers, and the quality of journalism offered in our best newspapers, also are supported by advertising. (If, in competition with other forms of media, there is a 15% shift of advertising dollars away from our leading newspapers, what will they cut?) Tougher competition with newspapers is almost certain: It seems inevitable that local telephone companies will become major players to offer expanded Internet services. The local telephone companies own the Yellow Pages, which are ideally suited for an online Website and timely information for consumers interested to make a purchase. (Telephone companies have rivaled the dinosaurs in their alertness to put the Yellow Pages online; but they are likely to bestir themselves soon.)

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[12] Increased competition for audiences and advertising revenue may also affect, for example, how much professional athletes are paid. For a broader discussion, see: Richard H. Frank and Philip J. Cook, *The Winner-Take-All Society: Why the Few at the Top Get So Much More Than the Rest of Us*, Reprint ed. (New York: Penguin, 1996).

Already, increased competition has led to a steady loss of audiences and revenue for television. (We have seen important effects on the evening national and local news, in chapter three.) Both broadcast and cable networks have responded by slowly and steadily selling more time for advertising. When there is a hit show in prime time, the networks counter-program their captive audience by increasing the time devoted to commercials. By early 2002, the attention tax rate on a viewer s time to watch commercials during a leading 30-minute prime time show on ABC, NBC, and CBS averaged about 25% - 30% - i.e., about eight to nine minutes. Across all programs, the average attention tax of non-program minutes has risen to 22% - 24% (13 ½ to 14 ½ minutes/hour) for leading broadcast and cable networks.[13] And the tax rate may continue to grow.

Already, like a shift in a gravitational constant, the changing economics of advertising has changed the Internet. In the early days of the Internet, it appeared that advertising revenue could support many Web sites, and it was part of the business plan for most dot-com startups.[14] At first, the novelty of banner ads produced a click-through rate of 8% in 1996, but this fell to 2% in 1998, to about 0.5% during 2000 and 0.25% in 2001 and began to undermine the economic viability of many dot-com startups.[15]

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[13] Chunovic, "TV Clutter Reaches All-Time High,".

[14] Ward Hanson, *Principles of Internet Marketing* (Cincinnati, OH: South-Western College Publishing, 2000) 124-48 et passim.

[15] Stuart Elliott, "Banners' Ineffectiveness Stalls an up-and-Coming Rival to TV," *The New York Times*, December 11 2000. Vanessa O'Connell, "Looking Beyond Banners to Revive Web Advertising," *Wall Street Journal*, February 26 2001. The

However new forces, with unknown effects, are getting underway. For example, the Holy Grail of advertising is to secure enough information about potential customers that ads can be selectively targeted to the right people, at the right time, to affect actual purchases. If this is possible, many more companies might find it cost-effective to advertise, and total advertising spending could soar. For example:

- It might become easier for cable companies to insert customized advertising into cable television programs, based on zip codes or other consumer information. If this happens, many local businesses may advertise on cable - for example, local restaurants on cooking shows.

- Global audiences will become available for the new niche channels that will develop. (As we will see in chapter nine, the most cost-effective advertising may be to underwrite high-quality mini-channels. Advertising agencies might buy or create niche channels to deliver well-targeted niche audiences.)[16] Global niche markets can

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performance of Internet advertising also can be measured and it must pass a tougher test. Traditional display advertising (e.g., $240,000 for a full-page ad in a single issue of Modern Maturity) is charged by the number of subscribers - the potential audience who might glance at an ad. The Internet permits advertisers to measure actual click-throughs and purchases, and repeat customers; it is easier for a company to determine if it is getting its money's worth.

[16] Scientific research channels are ideal vehicles for selling equipment or books of interest to scientists; for advertising job opportunities and travel packages associated with professional meetings, etc.

provide greater advertising revenue than domestic US markets alone - MTV, for example, soon will reach four times the number of households, worldwide, than the largest US networks (ABC, NBC, or CBS) can reach domestically.

- Another useful development - and a user-friendly idea to improve the efficiency of advertising, and make it attractive for new advertisers to purchase ads - is the consumer-request advertising mix. For example, it is a reality that consumers will be getting ads on their computer screen, and during 25% of their time watching broadcast television and cable channels. But a user-friendly approach might enable the consumer to affect the mix and ask: What do you want to see?

For example, if you are starting to think about Weekend Getaways, you could check this preference, and any other information you wanted to reveal, and receive customized ads outlining what advertisers hope will be attractive options. Or if you are thinking about purchasing a new car. Or want to know when Tom Clancy, Danielle Steele, or Stephen King publish a new novel. Or if you have young kids and are interested in local clothing sales. (And for people on limited incomes, knowing about such local sales could help to stretch their dollars.) With a light touch of creativity, and another small step of technology, perhaps the entire advertising industry will takeoff and its markets become more efficient, with happy results for everyone.

- Or - on the other hand - consumers might get fed-up and use new technology to block and neutralize the advertising being shoved at them. They can buy improved (digital) recorders and emerging video-on-demand capabilities (i.e., to view any show, anytime) to cut out commercials - just as they now purchase caller-

ID and telephone answering technology to deal with annoying increases in automated telemarketing. With these technologies, they also can cut-loose from the unique prime time schedule of broadcast and cable television. (If prime time viewer lock-ins disappear, the advertising revenue to networks is likely to decline.) If consumers strike back, it will register with the rating services and reduce the revenue of all networks.[17]

4.) Nature and Future of Entertainment

To measure the inherent entertainment value of television, listen to a sitcom and mentally delete the laugh-track that its producers have added. If it is still humorous and entertaining, it passes the test. But it may not.

We have a new tidal wave of new communications capability. Is it being used for anything worth listening to? With hundreds of channels, there may always be something on worth watching. If (like advertising dollars) a fixed supply of creative talent is spread more thinly, the average may decline and most entertainment may be just-barely entertaining.

Another reason to expect decline is that the entertainment value of most repeated reruns will decline. Global mass media are already a huge, 24 x 7 carnivorous beast that devours anything with even the slightest entertainment value. It is using-up finite resources at an extraordinary pace. One guide lists 19,000 old movies, many of which never had much box-office appeal or (if they are outstanding)

[17] Laurie J. Flynn, "Networks See Threat in New Video Recorder," *The New York Times*, November 5 2001.

have been shown often.[18] Even starting today, eight movie rerun channels, showing five movies per day, will exhaust the supply in 18 months and it will be time to begin again. By the nth cycle, the television reruns of Star Trek will have diminishing entertainment value; as will the other reruns and the nostalgia channels of old game shows (etc.) that are likely. Most sports entertainment - an endlessly-renewing supply of potential high-drama and big audiences - was already included in the broadcast and cable packages years ago and there has not been much consumer interest in watching reruns of this genre.

Yet the exciting unknown is the potential of growing demand to call-forth a revolutionary growth in the supply of the creative and performing arts. And adaptations of new technology (Hamlet on the holodeck.)[19] If this happens - i.e., if there are visionaries who organize it - there could be vast increases in the quality and quantity of entertainment in the world.

Will the vast communication and entertainment conglomerates think ahead and solve the problem of their own sustainable growth? One of the industry s and society s farsighted investments might be a substantial increase in budgets for creative and performing arts education; and community arts. Professional sports builds upon high school athletics programs. Is there an analogy?

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[18] Leonard Maltin, ed., *Leonard Maltin's Movie and Video Guide, 2002*, 2002 ed. (New York: Penguin Putnam, 2002).

[19] The phrase is from Janet Horowitz Murray s suggestive book: Janet Horowitz Murray, *Hamlet on the Holodeck* (Cambridge, MA: MIT Press, 1998).

Perhaps, too, everybody can benefit even if the effects are modest. If we can draw, from the entire world, another five hours/week of high-quality entertainment? Or one additional popular song or piece of music every three weeks that truly communicates and endures in our lives and popular repertoire? Or five more truly outstanding movies/year? Or could there be new and more entertaining forms of entertainment than conventional television?

Is this possible - both the organizing + sufficient understanding of what to organize? I do not know. If the answer to both unknowns is Yes, then we may shift from a future with a slowly sinking level of average entertainment to a better future where the average increases and the high points become more frequent (and perhaps higher than in the past).

5,) The Organization of Work

Compare a group of eleven-year-olds playing a multimedia computer game with a typical white collar office worker. The eleven-year-olds are energized, processing several kinds of information at astonishing speed, and linking input, with surprising eye-hand dexterity, to action.[20]

Could the typical white collar office worker become one, two, or more orders of magnitude more productive - and enjoy work more fully - if powerful processing capabilities pre-organize daily work and present it for action?[21]

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[20] I am indebted to Lynn Etheredge for this observation.

[21] We could imagine a similar possibility for students. What percentage of time is spent, by the average student in an average

Consider, for example, a classic discussion of white collar/technical work and man-computer symbiosis by J. C. R. Licklider forty-five years ago:

> Despite the fact that there is a voluminous literature on thinking and problem-solving, including intensive case-history studies of the process of invention, I could find nothing comparable to a time-and-motion-study analysis of the mental work of a person engaged in a scientific or technical enterprise. In the spring and summer of 1957, therefore, I tried to keep track of what one individual technical person actually did during the hours he regarded as devoted to work. Although I was aware of the inadequacy of the sampling, I served as my own subject.
>
> It soon became apparent that the main thing I did was to keep records, and the project would have become an infinite regress if the keeping of records had been carried through in the detail envisaged in the initial plan. It was not. Nevertheless, I obtained a picture of my activities that gave me pause. Perhaps my spectrum is not typical - I hope it is not, but I fear it is.
>
> About 85 percent of my thinking time was spent getting into a position to think, to make a decision, to learn something I needed to know. Much more time went into finding or obtaining information than into digesting it. Hours went into the plotting of graphs, and other hours into instructing an assistant how to plot. When the

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high school classroom, in a modest state of boredom?

> graphs were finished, the relations were obvious at once, but the plotting had to be done in order to make them so. At one point, it was necessary to compare six experimental determinations of a function relating speech-intelligibility to speech-to-noise ratio. No two experimenters had used the same definition or measure of speech-to-noise ratio. Several hours of calculating were required to get the data into comparable form. When they were in comparable form, it took only a few seconds to determine what I needed to know.
>
> Throughout the period I examined, in short, my thinking time was devoted mainly to activities that were essentially clerical or mechanical: searching, calculating, plotting, transforming, determined the logical or dynamic consequences of a set of assumptions or hypotheses, preparing the way for a design or an insight. Moreover, my choices of what to attempt and what not to attempt were determined to an embarrassingly great extent by considerations of clerical feasibility, not intellectual capability.
>
> The main suggestion conveyed by the findings just described is that the operations that fill most of the time allegedly devoted to technical thinking are operations that can be performed more effectively by machines than by men. [22]

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[22] J. C. R. Licklider, "Man-Computer Symbiosis (1960)," in *Multimedia: From Wagner to Virtual Reality*, ed. Randall Packer and Ken Jordan (New York: Norton, 2001), 60-61.

Licklider s analysis remains as fresh as the day he wrote it. His vision could be extended to groupware that aims to make collaboration (and meetings) more efficient and useful.[23] It is unknown whether white-collar productivity can be revolutionized. If so, and somebody does it, a new and changed universe begins to emerge.

6.) Generational Effects

Three (unknown) generational effects can change the world:

a.) The first generation of Internet entrepreneurs.

The Economist s Frances Cairncross called the young entrepreneurs who created the digital revolution and the Internet: the best educated group of entrepreneurs ever to blitz a business. [24] What will these veterans do with their wealth, their talent, their experience, and the rest of their lives?

The answer can be unusually important. The evidence suggests that the potential for leadership and accomplishment of young people is almost universally underestimated. In America, a

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[23] For an early collection of key articles: David Marca and Geoffrey Bock, eds., *Groupware: Software for Computer-Supported Cooperative Work* (Los Alamitos, CA: IEEE Computer Society Press, 1992). For a classic inventory of complaints about meetings see: Paul Meehl, "Why I Do Not Attend Case Conferences," in *Psychodiagnosis: Selected Papers*, ed. Paul Meehl (Minneapolis: University of Minnesota Press, 1973).

[24] Frances Cairncross, *The Death of Distance: How the Communications Revolution Will Change Our Lives* (Boston, MA: Harvard Business School Press, 1997) 118.

generation of young men, given positions of leadership and responsibility for important work at an early age, created the extraordinary takeoff of national economic growth after the Civil War. Similar effects came from the generation that participated in World War II.

b.) The MTV Generation.

Geopolitical strategists worry about whom (of five nation-states) will come to rule the world. Yet a more astute answer may be that the world will be run by today s youth. There is a global teenage culture created, expressed, developed, and refracted through MTV - the world s largest television network, reaching 384 million households on all continents. A compound of idealism and much else. Where does MTV lead, especially for a generation that enthusiastically embraces new technologies?

One of the noblest expressions of values in the early MTV world were the original Band-Aid concerts, and a famous anthem and video, We Are the World, with leadership by Quincy Jones, to organize relief for famine. Bob Geldof s memoir is called, Is That It?: The good will and global alignment of audiences were not embodied in the long-distance work of people and institutions who could sustain it.[25] The unknown evolutions of the MTV generation could range from increased effectiveness that changes the world, to increased alienation and withdrawal - or to no effects.

c.) The Baby-Boom Generation.

The third unknown generational effect: What will today s Baby Boomer generation do when they retire, with their remarkable levels

[25] Bob Geldof, *Is That It?* (New York: Grove Press, 1987).

of retirement incomes and experience?[26] What new applications will they organize, or find attractive?

7.) The Nature of Human Nature

> "It is prime time on Thursday night, the start of the Iranian weekend, and the three Government-run channels have lined up the hottest programs of the week.
>
> On Channel One, a mullah, seated in a garden, is giving a talk on the proper way to pray. "Never pray on a bed with a spring mattress," he intones. "You move around too much."
>
> On Channel Two is a videotape of the late Supreme Leader of the Revolution, Ayatollah Ruhollah Khomeini, warning about "the Great Satan."
>
> On Channel Three, a stiff ungainly carpenter in a blue smock moves toward a pine bookshelf in a nationwide special on woodworking. "Tonight," he said, "we will learn how to make corners . . . "
>
> Bright silver Iranian-made satellite dishes, costing $700, [now] dot the flat apartment roofs of Teheran and are beaming in everything from late night soft porno films from Turkey to the BBC news . . .

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[26] For an early report: David Brooks, *Bobos in Paradise: The New Upper Class and How They Got There* (New York: Touchstone Books, 2001).

> The reach of the satellite programs is enormous, especially among young Iranians, many of whom spend four and five hours a day watching the foreign broadcasts. In the last 12 months changes have been made in hair styles, dress, and even expressions, which now include a smattering of English slang . . .
>
> The most popular shows appear to be serials like "Dynasty," "Baywatch," and "Moonlighting" . . . For many Iranians, who live in a society where even a woman's ankle cannot be exposed, the racy American talk shows also are riveting. Phil Donahue and Oprah Winfrey have a huge following. . . "We are addicted to shows like Donahue," Mr. Damouzeh said. "Today Donahue had on a guy who has an open relationship with his girlfriend. This guy had brought along another girl he was also dating to the show. Both girls were with him. We couldn't believe it. We never hear or talk about this kind of thing . . . "
>
> . . .The foreign broadcasts have even spawned new trends. "People have started to get healthier," Mr. Pasha said. "People have started jogging . . . "
>
> - The New York Times[27]

The evolving global Internet is an experiment in greater freedom. It will provide additional data about human nature - what people truly want, when they have a greater freedom to choose.

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[27] Chris Hedges, "Satellite Dishes Adding Spice to Iran's TV Menu," *The New York Times*, August 16 1994.

The answer might be shaped by culture, levels of education, economic development, and other factors. Will the results be universal? Perhaps, in every country and culture, at a certain level of economic development, people use additional income to secure the same things. For example, better health care; or labor-saving devices for the home, such as sewing machines and small washing machines. Will everybody be drawn to Baywatch reruns and a secular and cosmopolitan culture on the model presented to the world by the Donahue show (above)?

One of Ithiel Pool s most interesting ideas was that people will begin to choose to live more naturally. He thought that at least four types of modern institutions were unnatural and forced by economic requirements of an industrial age that will be relaxed in the new era.[28] He predicted that natural human preferences will tend to reduce large cities and large hierarchical bureaucracies, augment the nation-state with other forms of organization, and change the division of labor.

Today, several initial answers being revealed by the new freedom of television, and new digital technologies may be obvious - but they nevertheless enter the databanks as universals of human nature, even if they are not stop-press headlines: People like to be entertained. They are interested in the news headlines and the weather. Teenagers seem universally eager to use email and cell phones to talk with their friends. People, in general, seem to use e-

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[28] Ithiel de Sola Pool, "Four Unnatural Institutions and the Road Ahead (1983)," in *Politics in Wired Nations: Selected Writings of Ithiel de Sola Pool*, ed. Lloyd S. Etheredge (New Brunswick, NJ: Transaction Publishers, 1998).

mail to increase contact with family members.[29] The evidence suggests that there may be a basic element of human nature, previously more constrained, to check out XXXX sites - although such data may disproportionately represent Internet activities of teenage males.[30]

But there also can be surprises, or at least a revealing clarity. We will see, in chapter eight, that data from the US and other countries show that a leading, new use for the Internet is to search for serious and detailed health information, for the user or for other people.

Summary

Table 4-1 summaries these seven unknowns, each of which will bear watching. The list also identifies additional opportunities (and de facto invitations) where breakthroughs could change the future for the better.

Table 4-1
Seven Unknowns

- Unanticipated changes and tradeoffs
- Telepresence
- The future of advertising
- The nature of entertainment

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[29] Manuel Castells, *The Internet Galaxy: Reflections on the Internet, Business, and Society* (New York: Oxford University Press, 2001) 131-32.

[30] The (usually comprehensive) Pew Internet and American Life project (www.pewinternet.org) does not ask about visits to XXXX sites in its otherwise thorough research.

Chapter 4

- The organization of work
- Generational effects
- The nature of human nature

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