Chapter Nine

Media and Information:
The Emerging Landscape of IT

Shifting From Natural Toward Mediated Information

From the beginnings of the printing press to the newspaper, the telegraph, typewriter, telephone, radio, and on to the latest forms of digital information technology, global information has multiplied exponentially. As it has, humans have subtly moved away from first-hand or face-to-face human experiences as their common form of information. Gradually they have substituted information shaped principally by those who collect, shape, and distribute information as some part of commerce. This shift from information as first-hand experience to mediated information—information largely shaped in words, pictures, and sounds at a distance by those unknown to us—holds multiple consequences for each of us, and for the cultures and commerce that shape our human experience.

In remote places such as the Tibetan plateau or the highlands of Papua New Guinea, media have yet to replace the exchange of first-hand or primary information, for in these places the world of face-to-face communication supplies what traditionally has passed for information. For most of the world's population, however, predigested, mediated information shaped for commercial or ideological purposes shapes what people learn, know, and use in living their lives. Mediated information and the technologies that carry it have become the principal epistemology or way of knowing through which many of us understand the world. This reliance on third parties from around the globe to supply what we take as true or false, and what we use to make our decisions has become a dominant feature of globalization and contemporary societies.

Mediated information via IT (Information Technologies) has become the sea in which much of the world swims. Consider a few of the many forms that information takes:

- Television, live and recorded, plus broadcast, cable, and satellite distribution;
- Radio, live and recorded, broadcast, cable, and satellite distribution;
- Music, live and recorded, and the instruments and devices which play it, from violins and horns to CDs, DVDs, and Ipods;
- Two and three-dimensional art forms;
- Dramatic and documentary films, videotapes, and DVDs;

- Special effects generated by computers for use in film, video, games, and advertising;

- Internet sources of every imaginable content and kind, from search engines, news, PowerPoint presentations, blogs and now vlogs (video logs), video conferencing, markets such as eBay, historic records, and interactive online games such as Second Life; these local, national, or global networks range from a few people to hundreds of thousands in interactive social networks such as YouTube, MySpace, Facebook, Wikipedia and corporate networks.

- Books, magazines, newspapers, and all forms of print on paper or available on other technologies;

- DNA, genome mapping, stem cell experiments, and forms of human nerve tissue adapted as computer memory, that is, biochips;

- Photography and computer-generated images;

- Wireless networks, including WiMax spanning entire cities;

- Advertising in all its distributional forms, including direct mail;

- Clothes imbedded with visible text and messages;

- Telephones, telephone cable systems, Internet telephone service, microwave relay systems, faxes, voice messages, videophones, and text messages;

- Recorded and online interactive online educational presentations, simulations, case studies, and games;

- Locater chips with global GIS technology;

- Government propaganda, news releases, and regulations;

- Distance education of all kinds from physics to business administration, tele-medicine and tele-health including surgery at a distance;

- Commercial surveillance of individuals, groups, corporations, and organizations by means of sound and video, individual consumer preference data;

- Government surveillance, including telephone monitoring, satellite photography;

- Espionage, covert operations, and warfare reports;

- Classified and secret government and business information;
- Computer operating systems, languages, software, applications, games, hard drives, CDs, and DVDs;
- A global network of fiber-optic cables and relays;
- Commercial transactions, barcodes, investment data, banking records, and sales agreements;
- Money, securities, currencies, and derivatives markets;
- Microwave towers and satellites carrying phone photographic, television, and computer information;
- Medical technologies and imaging such as sonograms, EKGs, EEGs, x-rays, PET scans, CT scans, MRI's, and laparoscopic video cameras and recorders and individual medical records; public health and epidemiology information;
- Microdots painted onto machine parts with identification data;
- Interactive information labels;
- Programmable specialty computer and technology chips for one-of-a-kind devices and innovations;
- Fabrics and materials with embedded nanotechnology information; and
- Nanotechnologies with information-gathering capabilities.

And so on, as innovations continue to revolutionize the media both shaping and conveying the information. The reader is encouraged to add to this list based on his/her own experiences. Estimates indicate that information is multiplying exponentially, making its effective organization and use increasingly a major global issue both commercially and personally and producing staggering implications for how education should take place to render it appropriate for dealing with the information explosion.

The technologies that shape and convey information have become so pervasive in our environment that we fail much of the time even to recognize their ubiquitous presence. Because information sways people and moves them to belief, action, or inaction, mediated information in its hundreds of forms—the latest news on CNN, the music playing from a CD, the latest stock market quotation, containerized shipments being tracked by GIS and coded

information—has become, along with mobile investment capital, the catalyst of globalization.

IT presently allows $1.9 trillion in daily global currency trading. IT allows job seekers and employers to find one another online. Software and computer applications allow people to collaborate in everything from architectural and industrial design to medical treatment, news reporting, inventory control, and the assembly of manufactured goods. Somewhere between 25 and 35 percent of people marrying in North America have met as a result of some on-line interaction. The just-in-time shipment of parts for production, the burgeoning global service economy, and even formal education now in many places rely on online interactive sources on information, some involving hundreds of thousands of people.[1]

Given that information increases so rapidly—doubling in less than three years—l earning to navigate this expanding sea of information has become an ever more important skill for entry into the labor force and many forms of work. No previous generation of humanity has faced the opportunities and dilemmas that the growth of global information now presents.

Media, Information, and Markets

Information makes markets function, but in contemporary global commerce, media and information have begun to shift the nature of markets themselves. In a world generating some $66 trillion in aggregated annual gross domestic product, global e-commerce is expected to reach $9 trillion by 2010. In the world of business online, 95 percent of the e-commerce is conducted business to business (B2B), with 5 percent business to consumer (B2C). Clearly for global businesses, high speed, accurate information is the lubricant that makes global trade possible.

Global information systems turn local markets into global markets, allowing small local businesses to reach buyers around the world. Via websites, online advertising, and search engines, businesses have new and more effective ways of finding and dealing with suppliers and service providers. And using the Internet, consumers have acquired growing power to search the globe instead of only local markets for products, services, quality, and prices. With IT affording consumers this new measure of power, competition among sellers intensifies, and the balance in markets shifts progressively toward buyers. On the other hand, the rising cost of oil has sharply raised shipping costs, interrupting the rise of local markets to global significance.

Direct mail advertising uses the traditional mail and newer delivery services in the U.S. to sell a wide range of products and services, generating an extraordinary $1 trillion in sales annually. But direct mail carries major environmental costs—$326 million annually in trash disposal, unmeasured transportation costs, a major

carbon footprint, and paper demands (NPR, 2005). Information has substantial environmental costs, as information on paper requires cutting roughly 4 billion trees a year (Martin, 2008).

The success of the worldwide auction service *eBay* indicates that individual buyers can now also become effective sellers, and that markets can extend to goods of every imaginable kind. *eBay* is a market like none other in history, for it sells everything, yet it operates simultaneously as a form of social capital -- an electronic meeting place for people. In its ten plus years of existence, it has become a market for new and used collectables, parts for various technologies, cars, boats, cameras, jewelry, sporting goods, musical instruments, toys, tickets to events, travel arrangements, one-of-a-kind items, as well as a source of educational workshops, community announcements, and group networking. As such it combines personal responses between buyers and sellers with information about the price, quality and availability of every conceivable form of article or service. Manufacturers can check *eBay* to see what kind of aftermarket their goods have. This huge global market is possible only because the Internet allows buyers and sellers to communicate instantly from anywhere in the globe.

As a consequence of high speed interactive media and global communications systems, we see new markets emerging, markets experiencing rapid, unexpected shifts, and market information becoming a highly valued commodity. Another example of a totally new market is that created by the search engine company Google to market ads to potential users, a market that has gone from almost nothing to over $6 billion in four years.]

Information Security Issues

The massive amount of information generated by credit histories, the use of credit cards, consumer retail cards, barcodes on goods, and medical information has allowed data companies to develop information data bases about individuals, their buying habits, and marketplace preferences. Hospitals now routinely have full patient histories available on their local networks, easing access for health care providers but raising security questions about patient privacy. With online sales requiring payment, and online banking a widely used feature of retail banking, security in online information transactions presents an ongoing problem. Moreover, credit histories, like medical histories, have in some cases become accessible online, and in a series of alarming computer thefts, tens of thousands of credit histories and other consumer information have been stolen by hackers. Similar break-ins have frequently occurred at military and industrial information bases. And hackers sending global viruses have cost information systems worldwide millions of dollars in IT repair and protection. To top it off, as a means of non-violent attack, governments surreptitiously have undertaken disruptions of Internet operations in other countries.

These aberrations in the information market reveal its vulnerability to criminal invasion and uses, and its difficulty in protecting information sources. Beyond

these data base break-ins and organized credit card thefts, identity theft has become a very real issue in industrial societies. Data theft by employees, especially those leaving a company, has become a major problem for industry in the past several years (BBC, 2004). People are beginning to realize that these events are not anomalies that occur once in a while, but events that occur with a predictable regularity. Consequently, protecting information has become a growing industry in itself. In the larger picture, we now see a global struggle by major businesses to keep up with the ongoing information revolutions that IT creates, as well as with the threats to information sources. (Note: as we discussed with the cycles of diffusion in Chapter One, an innovation triggers a set of subsequent reactions and counter-reactions. The IT industry treats these cycles of change as commodities, and new sub-industries rapidly grow up around them. See Castells, 1996).

Information Biases and Competition

Where once it was easy to distinguish between the source creating the information, the medium by which it would be conveyed, and the uses to which it might be put, the contemporary world of globalized IT now blurs these traditional lines. In the case of computers, the software that structures and conveys digital information is itself a form of meta-information that frames content and how the information will be shaped and received. As such, the combination of technology and information (IT) has implicit biases in what is included or omitted, and in the amounts and shapes of information it presents. Some such information obviously has more objectivity and balance, and less bias than other forms of it. Nonetheless, whether it is a textbook, an advertisement, a shipping manifest, a government announcement, a spread sheet for bookkeeping, or a design for a new factory, those shaping information seek to control how users will see it, that is, to persuade them of their attitudes about what matters and what does not.

Not unexpectedly, competition to control information has become a major feature of the tightly held global media oligopoly, as control means framing how buyers will see products and services, and how media giants can advance not just their market share, but persuade media users to embrace the very nature of globalization itself. Moreover, many of the major information providers of news now shape what the public receives in order to serve commercial and political agendas. Global media dominance by an oligopoly means that the information created and distributed will have as its primary goal serving the purposes of business, that is, it serves first as propaganda and advertising. Objectivity and truth have been at risk since Gutenberg's time, but contemporary media and information, with notable exceptions, tend to promote the value of commerce, sales, and markets above all else, including the value of human rights. The degree to which this effort to control media is being undercut by new communication media is discussed below.

Government Information Control

Because tightly controlled information has also traditionally been a feature of autocratic governments, we see many countries struggling vainly to control the advances of cell phones, satellite television, Internet blogs, and other forms of unchecked information. Government success in controlling information media presents a means of effective political control over their populations.

Examples of government attempts to control information and media abound even in countries where freedom of speech and press are held to be essential elements of their political culture. U.S. President George Bush spoke with certainty about Saddam Hussein having “weapons of mass destruction” as a cause for the U.S. going to war with Iraq. Global media carried his message, yet later these same information sources carried word that searches showed no such weapons existed. The free press later revealed that the U.S. president had been informed early on by American intelligence services that any such information about Iraq had not been substantiated by fact. The United States, however, by then had led a coalition of nations to war based on its own government-sponsored misinformation. While the U.S. celebrates being an open society with unfettered media and news, the government banned news photos of the coffins returning its war dead from Iraq. It also limited the access of reporters to civilian populations during the war (Woodward, 2004).

News sources next revealed that the president of the United States had issued a secret order to have the National Security Agency secretly eavesdrop on American citizens without the required legal approval of courts established to deal with just such situations. Other U.S. government attempts to operate outside the law and muzzle negative news about government operations date back to the Iran-Contra scandal in the mid-1980s and to federal officials seeking to suppress the release of the Pentagon Papers revealing government misinformation during the Vietnam War. In China during the recent Olympics the government promised journalists open Internet access, then reneged on the promise. Citizens in free societies look to an unfettered press to protect them from government control of information, but governments everywhere regularly find reasons to attempt to limit what the public knows (Roberts, 2006).

The commercial owners of the press tend to see opposition to government press limitations as an unnecessary risk to their profits. As a result government often succeeds in suppressing or reshaping its breaches of law, as media simply find it easier to pass along government press releases without checking their validity. This loss of vigorous research and reporting by news sources means that open or transparent government is always at risk. [2]

Similar efforts to control the news have been evident in China in recent years, including initial efforts by local authorities to first keep secret and then cover up the spill of hazardous benzene at Harbin in November 2005. During the outbreak of the initial SARS epidemic in the summer of 2003, the Chinese government

found ways to refuse cooperation with the World Health Organization (WHO) while seeking to keep information from reaching the world outside China. Interestingly enough, it was through newspaper reports in neighboring countries that the WHO authorities in Manila learned of the outbreak in southern China. The Committee to Protect Journalists of the National Press Club in the United States reported that in 2005, 44 reporters were murdered (half of them in Iraq) and more than 124 reporters had been imprisoned in twenty-four countries (Fauerberg and Wu, 2006).

Another illustration of this dynamic occurred in December of 2005 in China when a group of protesters in the village of Dongzhou in Guangdong province of China made news around the world. Some twenty townspeople protesting farmland taken for a new electrical plant were reportedly shot dead by authorities. With China as a new member of the WTO, and the Olympics scheduled in China, news media worldwide carried the story, but the Chinese government reported that only three protesters had died and that the police had fired in self-defense. Subsequent reports quoting villagers claimed that the Chinese government had threatened villagers if they attempted to tell authorities that family members had been shot. As reporting from Dongzhou continued worldwide, a group of prominent Chinese dissidents in an open letter on the Internet called on the Chinese government for a full-scale investigation. The Chinese government story discounted comparisons with the Tiananmen Square riots and deaths in 1989. *The Washington Post* reported that, “Almost all of China's state-censored newspapers and other news outlets have been silent on the clash, which arose from a long-simmering dispute over the confiscation of farmland” (Pan, 2005). A similar dynamic of cover up marked the early days of the milk scandal in China in which it was discovered that the industrial chemical melamine had been inserted into milk products including infant formula to boost its protein count. Only when it became clear that this was a major problem did the central government “take charge” of the problem and allow more open and uncontrolled media coverage (AP, 2008).

Similar news suppression by the Chinese government occurred when protests erupted in Tibet in 2008. Journalists had been promised access to areas where disturbances occurred, but access was then denied. The Chinese government subsequently produced news releases describing rioters as anti-patriotic. China controls Internet sources within the country. As Hannah Arendt remarked in the late 1960s in the midst of the U.S. Viet-Nam crisis, disinformation is as old as government itself.[3]

Manipulating Media

Clearly the advent of cell phones, the Internet, satellite telephone, faxes, television, and a variety of other media, plus international news reporting and the presence internationally of those involved in global trade combine to make it difficult or next to impossible for governments to suppress coverage of negative

news. Nonetheless, regimes the world over continue to use disinformation and propaganda on their own people as a means of control. Some disinformation becomes part of the information flow in globalization, affecting everything from foreign direct investment to sales of goods to currency values.

The increasingly commercial, political, and ideological nature of IT, then, leaves many of those supplying it in the role of propagandizers or advertisers, even if what they hope to sell is only an idea or a viewpoint or the goods for which the "news" involved is only a pretext. Simultaneously, those relying on IT subtly are at the mercy of conscious media biases, and need to be able to sort through these biases or their intent to exploit. News media become the willing partners of political biases.[4] For example, consider all major U.S. TV networks playing the tape by Osama Bin Laden following the attacks on the World Trade Center, a propaganda coup for Bin Laden worth many millions of dollars. Or consider how these networks carried the political advertisements as news criticizing John Kerry's war record the 2004 U.S. election. Because sensational news brings more heads to the TV set or the newsstand or Internet outlets, and hence sells more advertising, the dominant television media, radio, and newspapers control the direction of everything from elections to revolutions. Ironically, the rise of blogs, independent online editorial sources, has arrived to supply more individual expression and balance to the marketplace of political information but by their very nature blogs raise new issues of veracity and quality control of information.

Concentrating Control

As it has in other industries, the IT market concentrates ownership into the hands of increasingly fewer large TNC's, limiting the major avenues by which most information reaches audiences. Robert McChesney notes how relatively recent this development is, and how it operates as an essential component of contemporary globalization. "The global commercial system is a very recent development. Until the 1980s, media systems were generally national in scope. While there have been imports of books, films, music and TV shows for decades, the basic broadcasting systems and newspaper industries were domestically owned and regulated. Beginning in the 1980s, pressure from the IMF: World Bank and U.S. government to deregulate and privatize media and communications systems coincided with new satellite and digital technologies, resulting in the rise of transnational media giants" (McChesney, 2001).

These dominant global information technology TNCs and their second tier counterparts control the flow of some 70 percent of news. The global impact of these firms is enormous. Christopher Dixon, a media analyst at the investment firm PaineWebber argues that what we are witnessing "is the creation of a global oligopoly. It happened to the oil and automotive industries earlier this century; now it is happening to the entertainment industry." McChesney and Shiller continue, ". . . a few leading conglomerates thus dominate the larger process of reorganization, and aspire to grow still larger and more diversified to reduce risk,

avoid being outflanked by rivals and enhance profit-making opportunities. The upside is high; this is a market that some anticipate will have trillions of dollars in annual revenues within a decade" (McChesney and Shiller, 2003). These firms operate in many nations yet avoid being associated with any given nation-state. In computing alone, despite competing open source operating systems and competing chip manufacturers, two giants, Intel and Microsoft, continue global domination of computer products.

Oligopolies, Foreign Direct Investment, and Outsourcing

Notably, Intel in 2006 announced plans to invest $1 billion in India, with Microsoft following with a planned $1.7 billion and Cisco Systems investing $1.1 billion in India as well. The three IT giants' investments offer recognition of the growing intellectual capital of India, where many well capitalized information firms provide outsourcing for information work from advanced western economies. Add to the picture the investment bank J. P. Morgan Chase doubling its staff in India to 9,000 in order to handle business linked to telecommunications, and one begins to see why India's place in the global IT market is expected to grow from $17 billion in 2005 to $60 billion by 2010 (*The Economist*, Dec. 17, 2005) Moreover, with a population of over a billion, India's growing middle class presents a burgeoning market for IT and a ready labor supply for outsourcing information work from more costly sources such as the United States. India—with its population having English language skills and a tradition of English common law—already creates and sells software, and has rapidly growing global businesses in outsourced work from U.S. insurance, legal, medical, and banking firms. With information multiplying exponentially, it follows that markets driven by information must devote more capital to IT, and that the market in information itself is likely to grow rapidly as well. India offers the comparative advantages of price and talent to lead tens of thousands of IT jobs to be outsourced to it from western industrial countries.

In still another sub-IT market, Internet search engines have multiplied and specialized, yet Google and Yahoo have rapidly emerged as the dominant Internet search engines globally, handling some 70% of all searches. These search engines have created auction markets where, within a given country, an online users search for information becomes part of an instant auction to see which firm will have online ads presented to the person making a search (Battelle, 2005).

As we have seen in countries where government itself controls television, radio, parts of the Internet, and newspapers, the dominance of fewer global information firms holds strong potential for news with biases celebrating the advantages of globalization and offering far less attention to its drawbacks. Moreover, such oligopolies mean tighter control of information and programming that billions of people use to shape their lives.

Marketplace Transformations

Global sales of U.S. major film studios in 2007 reached $34.9 billion, amplifying the cultural outreach of America (Aguilera, 2008). Video games, most of them played on three platforms by Sony, Microsoft, and Nintendo, or online via computers, generate global sales that grow by an amazing 22 percent annually. U.S. sales of computer games skyrocketed 43 percent in 2007 to $17.9 billion with the three most popular game platforms alone selling at $5.1 billion in 2007 (Gaudiosi, 2008). Clearly, computer games are rapidly becoming a pervasive global communication medium, linking people via informal networks of shared information. As they have developed, electronic games now link groups of competing or collaborating users, so-called MMORGPs (massively multiplayer online role-playing games) new networks of people at a distance playing together yet often remaining anonymous. Game users now create their own identities within the game scenarios.

Moreover, electronic games online now create active global user markets. Fantasy rewards and items in the games have acquired real world value via active markets for various game advantages. According to *The Economist*, in China, professional game players, so-called *farmers,* play online games all day, then sell for real money on *eBay* and elsewhere the in-game advantages they have earned—a blending of fantasy features with real world markets (*The Economist,* Dec 17, 2005). Game users have developed active global sales of successful fictional characters that in some cases, other game players will pay to acquire. For example, a game fantasy character that has succeeded in clearing difficult initial game hurdles, making subsequent play easier has a distinct “value” that can be commodified and traded. Just where such interactive uses of media and information will lead game players has become the subject of recent sociological study (McChesney and Nichols, 2000). While some observers raise alarms about the violent nature of many e-games and the addictive impact they seem to have on some players, others note that—just as we see product placements in dramatic films—we see product placements in e-games (i.e., characters and conflict joined with advertising to have game players interacting with product messages). Linking books, movies, television series and Anime to interactive games has become commonplace in this expanding market. Global advertising thus finds its way into each new form and medium of information, creating commercial products and services as a common global frame of reference.

The transformation of cell phones into devices that routinely feature personal assistant software, cameras, text messaging, the ability to receive photography and live television as well as recording and playback of speech and music, credit card swiping for online sales, email access, and an array of interactive games has created a new dimension of what are regarded as “media”. The personal, portable information device that started as a cell phone now combines attributes of such earlier devices as TV, music playback technologies, radio, computers, and online information exchange. Novelty and combinations of sources of

change, for example, text messaging, alone now accounts for billions of messages a month in many countries, multiplying and extending global networks. (Manila, P.I. is currently the text message capital of the world.)

As parts of the global IT industry concentrate further into powerful TNC oligopolies, the market appears to be closing for major new competitors. The cost of entry is viewed as too high. In response we see governments such as the European Union insisting that the dominant IT technologies include limits that keep competition open. For example, the EU continues to hold computer giant Microsoft to stringent requirements that limit its control of markets. Meanwhile the array of separate submarkets that comprise global IT—books, magazines, newspapers, music recording, TV production, satellite systems, motion picture theaters—remain subject to rapid change from innovations and new combinations of products and services. The profitability of global media giants has now turned consolidations in an unexpected direction, as some major holders sell off various divisions that fail to turn a profit. For example, the New York Times Company sold off nine of its TV stations in 2006. According to Slate magazine, “Time Warner, Viacom, News Corp., Clear Channel, and Comcast-(sic) lost 52 percent of their value (in terms of market capitalization) over a five-year period at the beginning of this century” (Shafer, 2007). Nonetheless, as McChesney and Nichols point out “The global media system is in the process of converging with the telecommunications and computer industries to form an integrated global communication system” (McChesney and Nichols, 2000).
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With the arrival of digital television, innovations such as TiVo are promoting further convergence of technology and media patterns, turning television sets and DVD players into computers that record and play Internet transmissions of digital video. While making TV programs available at the viewer’s choice and allowing viewers to scroll past advertising, a considerable threat to the profit base of television broadcasting is raised. Simultaneously, computers tap online sources or DVD’s to reproduce high quality digital video versions of news programming and dramatic films. Television accessed by computer in effect competes with the traditional distribution channels of television, forcing information producers and distributors to tailor programming to the possibilities of computers. Among these, of course, is the opportunity for viewers to interact actively with the information being presented to them. The commercial and educational possibilities of this breakthrough have yet to be fully exploited. Some of the implications of these media changes can be witnessed in the development of content producers that exist outside the old “commercial network” structure. Whatever stock one takes of these developments at a given moment, one can be assured that continuous change is in the offing. For example, in September 2008, DVDs and DVD players were predicted to soon become obsolete as media giants attempt to make digital storage online with them the new standard.

And as we pointed out in Chapter One, globalization is being organized around information that takes the form of symbols and symbolic processes, including the $700 billion a year global advertising industry dominated by half a dozen mega-agencies that handle the business of global TNC's (Morais, 2008). Commercial brand names such as Sony, Nike, McDonalds, Coca Cola, and Pepsi have become symbols that claim global recognition, as do some of the sports celebrities who promote global products such as Tiger Woods for Nike, or basketball player Yao Ming for Coca Cola. Via such figures TNC's advocate the consumer culture of western industrial societies, one that collides with traditional national and indigenous cultures. The drumbeat of global media—television, films, advertising, electronic games, sports equipment, the Internet, cell phones, and other communications technologies—sells the products these individuals endorse, and makes such celebrities into world-renowned figures, living brands, and extensions of the commodities that they endorse.

Computer networks reveal a shifting mosaic of changing software, hardware, copyrights and patents, open sources, and disparate sources—all struggling to fit together. How the pieces of the mosaic create a coherent picture and a smoothly functioning set of networks remains an unanswered but vitally important question. While Microsoft carefully guards its patents and the royalties they generate, IBM announced in the fall of 2005 that it would make its patent information available royalty-free to anyone designing software standards for health and education (Miller, 2005). While media giant IBM retains tight control over its business and management computer sources, its movement toward open sources suggests that a major player in the information marketplace sees more advantages in some forms of collaboration than in control and competition. As proof that open-sourcing bears fruits, IBM offers the example of the chip resulting from collaborations with Sony and Toshiba for the popular PlayStation game device. Other firms—Sun Microsystems, Solaris, and Nokia—have followed suit in limited releases of royalty free patent use.

This kind of collaboration foreshadows the possibility of major media firms meshing their software royalty-free as a strategy to hold market share and to improve future links in global communications. For example, Google collaborated with Sun Microsystems on an open-source OpenOffice project, suggesting that Google is eyeing Internet-based office productivity software. The next several years will tell if this gamble on open-sourcing collaborations generates information industry profits versus traditional forms of competition.

Does Information Fit or Serve Its Purpose?

As for the future, information guru and prospector Ray Kuzweil surveys the multiplying global growth of IT and suggests that its exponential growth and ballooning size raise serious questions about how orderly so much information can be, "*Order is information that fits a purpose*. The measure of order is the measure of how well the information fits the purpose. . . Information is a

sequence of data that is meaningful in a process, such as the DNA code of an organism, or the bits in a computer program." He sees the evolution of technology-driven information speeding up and yielding exponentially better returns. "A primary reason that evolution – of life-forms or of technology – speeds up is that it builds on its own increasing order, with ever more sophisticated means of recording and manipulating information. Innovations created by evolution encourage and enable faster evolution. . . Innovation is multiplicative, not additive. Technology, like any evolutionary process, builds on itself. This aspect will continue to accelerate when the technology itself takes full control of its own progression" (Kurzweil, 2003).

The prospect of global technology taking control of its own evolution may seem illusory or a science fiction reach beyond the day-to-day technology and information we use. Kurzweil, however, is examining the driving forces behind information how it takes new forms and becomes all the more important in global commerce, affairs, and governance. As he sees it, "Not only is each chip doubling in power each year for the same unit cost, but the number of chips being manufactured is growing exponentially . . . Each stage of evolution provides more powerful tools for the next." As innovations multiply, IT has itself become a complex system whose predictability declines as its innovation progresses. According to Kurzweil, the rapid expansion of information makes whomever controls global IT all the more vital a question. The answers may not well serve those on the receiving end of the information if it is controlled by a concentrated global IT oligopoly.

Links for Further Study

The future of IT is perhaps best captured in a 2006 lecture by information guru Ray Kurzweil, who points out the parallels between human evolution and the evolution of information technologies, the accelerating pace of information growth, and the pervasive place of IT in everything from human health to business to government to personal life. We urge you to watch this lecture, available at:
http://www.ted.com/index.php/talks/ray_kurzweil_on_how_technology_will_transform_us.html

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Endnotes to Chapter Nine

[1] Indira Gandhi National Open University has over 600,000 students. India currently supports 11 national open universities. (IGNOU, 2005)

[2] News reporters and analysts curry favor with government leaders to gain information for their publications. In a subtle process, the giver of the information controls the gatherer of the information. For example, note the celebrated case of the American Vice President's chief deputy "Scooter Libby" revealing the identity of CIA agent Valerie Plame, or the New York Times withholding information on President Bush's secret FISA memo for a year. Reporters fear offending news sources lest they be denied further access. The result is yet another fetter on the supposedly unfettered press.

[3] "Secrecy—what diplomatically is called "discretion"—and deception, the deliberate falsehood and the outright lie used as legitimate means to achieve political ends, have been with us since the beginning of recorded history." Cited in Neubauer, 1977.

[4] In cases such as Fox News, the heavily conservative bias of the commentary and the subjects selected are presented as if they are objective news. In the United States millions of people list Fox News as their primary information source and accept it as definitive. Surveys taken in the months following US entry into the Iraq war indicated that viewers of Fox News were far more likely to believe that Saddam Hussein was deeply connected to al-Qaeda and the attacks on the World Trade Center (and other misperceptions of the war sponsored by the US government). Those taking their news from other sources generally believed otherwise, principally because the Fox view was widely discredited in the broader news media. (Lobe, 2003) This fusion of news and opinion creates a new level of bias in news reporting. (Kurtz, 2005)