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American Visions of the Internet: A Crisis of Trust

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Originally accepted by Digicult and then considered too controversial.

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1. Introduction

Since its beginnings in the 1960s there have been many stories about the Internet. One is that the Internet was a US invention. The story that officials in AT&T were once adamantly opposed to the Internet[1] led to a received wisdom that telephone or telecommunications companies (telcos or telecoms) and the Internet were unrelated. The telephone companies, we are told, were big monopolies, blind to innovation and the Internet was started on the sly by a few scientists and academics. The Federal Communications Commission (FCC) version is more subtle:[2] The telcos did infrastructure, while those who developed the Internet did applications.[3]

When one looks more closely at the evidence, a very different story emerges. The Internet began in Europe. In the United States, which is the focus of this essay, the development of the Internet has been dominated by the major telcos. While received wisdom tells us that AT&T was disbanded in 1984, there is evidence that the major players are a) AT&T; b) its competitor MCI/Worldcom; c) AT&T's Baby Bells especially Bell Atlantic in its new guise as Verizon and d) AT&T's BellCore in its new guise as Telcordia. In theory these are four sets of players. With the bankruptcy of MCI/Worldcom, there is in fact only one major player: AT&T in the various guises as itself, the Baby Bells, and its research labs (Lucent,

Telcordia). There is significantly more cohesion between the parts of AT&T than would at first sight appear.

AT&T was a telecommunications company with Internet interests. Through its various subsidiaries AT&T became intimately involved in four related domains:

a) Electronic Numbering: to achieve Internet Telephony[4]
b) Domain Name Systems
c) Education
d) Next Generation Internet.

AT&T's links with carrier equipment companies, computer companies, content holders and home entertainment firms have led to a much more comprehensive vision that includes the entire information/knowledge production and life-cycle. An understanding of this vision gives insight into factors behind some of the bankruptcies among those who are not part of this plan. While this vision is largely industry driven, it has significant links with academia, government, and the military. It will be suggested that this vision entails six major trends.

Parallel with this is another vision of media, investment and energy which, though championed by the President himself and nominally the government, has strong connections with the secret services and the military. This second vision entails many of the important events of the past years: September 11, 2001, the Afghan war, the so-called "wars" on drugs and terrorism, the spectre of a new oil crisis, the war with Iraq and possibly other "evil" states. This vision links media, finance and energy. It is prepared to use military force to attain its ends. In theory, the two visions are completely independent. In practice, the second appears to be compromising the first. The Internet, which is supposedly for everyone all over the world, is in danger of becoming the tool of a small elite in the US government. While posing as representatives of the people, this elite appears to have agendas, which entails a crisis in trust and integrity and threatens to undermine the future of freedom and democracy. While the first vision offers serious cause for concern, the second vision poses dangers for the future of civilization. It is shown that recent economic crises are overshadowed by a more fundamental crisis in trust, integrity and a legal framework.

2. Background of the Internet

We are almost always told that the Internet began solely in America. This is not really true. The earliest pioneers included a Frenchman, Louis Pouzin,[5] who introduced the idea of data grams and an Englishman, Donald W. Davies,[6] who was one of the inventors of packet-switching. Another of the great pioneers in Britain was Peter T. Kirstein,[7] who went to America at the beginning of the Arpanet in 1969 when it was decided that Davies could not go for reasons of national security.[8] According to Bruce Sterling:

> The National Physical Laboratory in Great Britain set up the first test network on these principles [of packet switching] in 1968. Shortly afterward, the Pentagon's Advanced Research Projects Agency decided to fund a larger, more ambitious project in the USA.[9]

Hence an English project[10] of 1968 inspired the beginnings of the US Internet in 1969. It seems false to claim that America invented the Internet and is simply misleading to argue that because America invented the Internet, it is their right to control its governance through organizations such as the Internet Assigned Names Authority (IANA) and more recently the Internet Corporation for Assigned Names and Numbers (ICANN).

3. AT&T

Long before the Internet began, AT&T founded Bell Labs in 1925. In the 1930s, Vannevar Bush was a professor at the Massachussets Institute of technology (MIT) working on a Differential Analyser machine that led to the Electronic Numerical Integrator and Computer (ENIAC).[11] In 1945, Bush went on to write *As we may Think*, which was one of the first published visions of what the Internet might become. Vannevar Bush's[12] student at MIT in the 1930s was Claude Shannon who recognized a close similarity between the Boolean algebra that he had learned as an undergraduate and an electric current. "The next obvious step would be to lay out circuitry according to Boolean principles, allowing the circuits to binary-test propositions as well as calculate problems."[13] Claude Shannon, Vannevar Bush and Norbert Wiener, the father of cybernetics all knew each other well.[14]

Shannon graduated from MIT in 1940, and in 1941 joined the Bell Telephone Laboratories, where he was "charged with the tasks of developing more efficient information transmitting methods and improving the reliability of long-distance telephone and telegraph lines."[15] Information was taken in its widest possible sense to include messages occurring in any communications medium - television, radio, telephone, data-processing devices such as computers and servomechanisms, even neural networks. This led Shannon to develop information theory (1948)[16], which is the cornerstone for the digital, electronic communication of information. Wiener's book on *Cybernetics* was published in the same year. Hence the context for the internet was prepared at AT&T's Bell Labs.

The same Bell labs did some of the first digital transmission and switching in 1962, seven years before the US Internet began. When the Department of Defense (DoD) commissioned the Advanced Research Project Agency's Network (ARPANET) to do research into networking, it was AT&T that provided 50kbps lines. In 1969, the year that the Internet began, AT&T's Bell Labs developed Unix which was "the operating system behind the early Internet, and was one of the key operating systems in the middle and late ARPANET."

John Quarterman has noted that Ken Thompson and Dennis M. Ritchie "originally managed to develop [the] UNIX [software], starting on a machine in an attic, largely by convincing AT&T Bell Labs that they were really working on a text-processing system for handling patents."[17] This led later to RFC 681, "Network Unix," (May 1975),[18] the operating system behind Usenet. Quarterman noted that "AT&T itself often didn't seem to know half of what its own people were doing. For several significant years, a sizeable proportion of USENET was supported for free by AT&T."[19] In Quarterman's version, AT&T had a few bright visionaries working away while the management was blind.

There are reasons to believe that management must have been aware of something. Between 1969 and 1972, Bell Labs developed the C programming language basic to much of Internet software. In 1970, AT&T installed the first cross-country link between the University of California at Los Angeles (UCLA) and Bolt, Beranek and Newman (BBN) in Boston. In 1976, AT&T's Bell Labs developed (Unix-to-Unix CoPy (UUCP), which was distributed with UNIX one year later.

In the 1960's, Michael Lesk "worked for the SMART project, wrote much of their retrieval code and did many of the retrieval experiments, as well as obtaining a PhD in Chemical Physics." He joined Bell Core and in the 1970s he "worked in the group that built Unix." He wrote Unix tools for word processing (*tbl*, *refer*), compiling (*lex*), and networking (*uucp*). In the 1980s, he "worked on specific information systems applications, mostly with geography (a system for driving directions) and dictionaries (a system for disambiguating words in context).[20] He went on to become Chief Scientist of Bellcore[21] and later became the Division Director, Information and Intelligent Systems at the National Science Foundation (NSF).[22]

At the time of the divestiture of in 1984, AT&T changed its Central Services Organisation (CSO) into Bell Communications Research (BCR) "to serve the Bell operating companies providing a center for technological expertise and innovation." That same year, AT&T introduced the North American Numbering Plan.

Another scientist, Dr. Bruce R. Schatz, also "spent ten years in industrial R&D at Bellcore and Bell Labs, where he built prototypes of networked digital libraries which served as a foundation of current Internet services through the *Telesophy* project.[23] It has been claimed that this project on multimedia information retrieval across networks "showed the feasibility of what became the World-Wide Web 10 years later."[24] In an e-mail of 1 February 1985 18:52, Dr. Schatz described his vision of the Telesophy project as a "worldwide information community, a greatly generalized USENET."[25] At the time, the Telesophy project was not seen as a priority at Bell Labs. Accordingly, William Y. Arms, then the Vice President, Academic, of Carnegie Mellon University wrote a letter of support.[26] Professor Arms went on to become the Director of Library Systems (1995-1997) and later the Vice-President of the Corporation for National Research Initiatives (CNRI, Reston VA). Meanwhile, Dr. Schatz went on to develop the WCS [the Worm Community System]. [27]

Dr Schatz went on to become scientific advisor for digital libraries and information systems at NCSA when they developed the Mosaic browser. He also became Principal Investigator of the NSF/DARPA/ NASA Digital Libraries Initiative project and subsequently developed the Interspace project, which plays a role in visions for a Next Generation Internet (figure 3a . Cf. below section 10). More recently NASA has also been exploring an interplanetary Internet which may potentially replace the idea of packet switching (figure 3b).

In 1986, when New England was cut off from the net, it turned out that all seven of the ARPA trunk lines were in one large AT&T cable. According to their own website, from 1984 until 1996, "AT&T was an integrated provider of communications services and

products, network equipment and computer systems."[28] Could all of this have been allowed to evolve without any knowledge and endorsement by the management?

In 1991, AT&T merged with National Cash Register (NCR) "in a $7.3 billion deal that gave AT&T the ability to better meet customers' needs for networked computing, globally."[29] It is striking, that when InterNic was established by the National Science Foundation (NSF) in 1993, the directory and database services were given to AT&T. (cf. Appendix 1-2). In 1994, AT&T became one of the first companies to experiment with Internet banner ads. AT&T's Worldnet – also the name of Schatz's vision outlined above-- was one of the early Internet Service Providers (ISPs). In 1996, the corporation voluntarily split into three companies:

1. AT&T	communication services
2. Lucent	communications products
3. National Cash Register (NCR) Corp.	computer business.

In theory, there was now a clear distinction between telephony interests (AT&T and Lucent) and computer/Internet interests (NCR). In practice, the situation remains more complex for at least three reasons. First, AT&T itself today has three Internet related research laboratories: 1) Research Internet and Network Systems Research[30]; 2) Voice Enabled Services Research[31] and 3) Information and Software Systems Research.[32]

Second, Lucent, a spinoff from the old Bell Labs, in addition to its work on data networking and integrated circuits, has no less than eight sets of products related to the Internet.[33] Third, and perhaps most significantly, AT&T's Central Services Organisation (CSO), which became Bell Communications Research (BCR or Bellcore) was officially sold to Science Applications International Corporation (SAIC, cf. below section 4), but continues to have goals very close to those of AT&T, particularly in fields such as ENUM (see below section 7). After 1997, AT&T was officially only a "communications services" company. Nonetheless, it continued to expand its interests beyond the narrow confines of telephony. For instance, in 1998 AT&T bought the cable company, MediaOne. According, to Clay Shirky, the motivation for this move came from AT&T's plans to become "the sole provider for high-speed internet access for a sizable chunk of the country.[34]

In the past five years, there has been enormous activity to extend networks beyond computers to include all information appliances. Here the Home Audio Visual Information (HAVI)[35] consortium, which includes Philips, was a pioneer. Others such as the Universal Plug and Play Forum[36] want to extend this concept to smart objects and intelligent devices – especially attractive under an IPv6 architecture where the slogan "IP Everywhere" is no exaggeration with the possibility of several billion IP numbers per mm² of the Earth's surface. Low-level artificial intelligence systems "currently monitor military systems, optimize the water level in dishwashers, control the actions of simulated pets, and help predict natural disasters."[37] This is an area on which the research labs of AT&T have been working on for decades under the title of telemetry.[38] For instance, in 1999, Lucent's Kenan Systems and Whisper Communications entered into a global marketing agreement for utilities and energy service providers to:

> answer the specific billing, customer care, order management, decision-support and usage mediation requirements of leading service providers in the communications and utility industries world-wide, including gas, electric, water, mobile and wireline voice and data services, broadband, Internet, and value-added services.[39]

If these developments are considered from a global level there are five sets of players in the ICT game: 1) the telcos (AT&T, Sprint, British Telecom, Deutsche Telecom, France Telecom, Cable and Wireless etc.); 2) the computer companies (IBM, Compaq/HP, Sun, Microsoft, Apple); 3) the carrier equipment companies (Cisco, Lucent, Nortel, Alcatel, Ericsson); 4) the content holders (Reed/Elsevier, Thomson, Murdoch, Bertelsmann, and AOL/Time Warner and Vivendi/Universal, which looked doomed and is making a comeback) and 5) the home entertainment companies (Sony, Philips, Samsung etc.) Together these players represent different aspects of the digital knowledge production chain or knowledge life-cycle.

Theoretically these sets of players are all in competition with one another. In practice AT&T has links with all parts of this knowledge life-cycle. For instance, with respect to computer companies, AT&T has links with Microsoft[40] and long-standing links with IBM. Already in 1991 IBM and AT&T Paradyne announced that they would develop mainframe network technology together.[41]

> On December 8, 1998 AT&T and IBM announced a series of strategic agreements under which AT&T will acquire IBM's Global Network business for $5 billion in cash, and the two companies will enter into outsourcing contracts with each other. The contract for AT&T to acquire IBM's network was completed in the US on April 30, 1999.[42]

In 1999, AT&T and IBM made an E-Commerce alliance.[43] In 2000, AT&T and IBM announced that they would work together in providing wireless solutions.[44] In September of 2000 IBM and AT&T signed a $450 million web hosting deal.[45] In 2001, IBM, AT&T and Lotus (owned by IBM) announced an Application Service Provider (ASP) Enablement Suite.[46] In 2002, IBM and AT&T released free privacy tools together.[47] In addition, there are a series of further links through IBM. In 2002, IBM acquired PriceWaterhouse-Coopers in order that, among other things, their educational solutions will be aligned.

With respect to carrier equipment, both AT&T, and IBM have close links with Cisco. With respect to content holders AT&T and AOL are poised to launch an IPO together.[48] AOL has made links with Legend Computers in China. With respect to home entertainment IBM has links with Toshiba and Sony for making Playstation 3.[49] In this constellation, pipelines and content are integrated. IBM is theoretically in competition with EDS and SAP but is also partnered with them.[50] Hence through a nexus of AT&T, IBM, Cisco, AOL, and Sony all five sets of players are linked.

From all this[51] it is clear that a) AT&T's interests in networked computing existed well before the Internet; b) AT&T's interests played a significant role in the development of the Internet and c) neither the forced split up in 1984, nor the voluntary partitioning into communications services (AT&T), communications products (Lucent) and computers

(NCR) in 1996 changed this fundamentally. In short, AT&T[52] has been and remains centrally active in the development of the Internet.[53]

4. MCI/Worldcom

Until June 2002, MCI/Worldcom was one of the only serious competitors to AT&T in the US scene. Microwave Communications of America, Inc. (MCI) was founded in 1968 to help truckers communicate via two-way radios. In 1969, the FCC approved MCI's application to provide private microwave service between Chicago and St. Louis. MCI went public in 1972 and in 1973 became "the first telecommunications company to market specialized services to the public." In 1974, MCI began a series of lawsuits against AT&T, which led to the latter's divestiture in 1984.

In 1975, MCI activated its first computer switch. This became the cornerstone of MCI's network. In 1983, MCI made the largest order of fiber optic cable ever placed thus far of more than 150,000 miles. By 1987, MCI's new coast-to-coast fiber optic network began operations (Appendix 3). In 1997, World Com announced plans to acquire MCI.

During the 1960s and 1970s, Worldcom itself had pioneered packet services and the use of international X.25 standards for public packet services for point of sale and credit card transactions. In 1977, Worldcom introduced the first internal e-mail service (INFOPLEX); in 1979, the first online consumer service; in 1983, the first e-commerce application with an e-mall of 100 stores, where orders could be placed and in 1988 the first Internet access service and first commercial connection to the Internet.

In the decade that followed, WorldCom became involved in a number of pioneering experiments leading to higher bandwidth such as the National Science Foundation Network (NSFNET linked with Compuserve, 1989); a long-haul Synchronous Optical Network (SONET, 1990); a public Frame Relay service (1991); a commercial version of frame relay on a cell-based network platform (1992); a dedicated, multipoint Internet Protocol Virtual Private Network (IP VPN, 1994); integrated service for voice, data and video transmission over an ATM network (1994); combined Synchronous Optical Network (SONET) and Asynchronous Transfer Mode (ATM) technologies and the first 10 Gbps data transmission on an enterprise network (1995) and high-speed Frame Relay service (1996, Appendix 4).

UUNet, founded in 1987, became the first business Internet Service Provider (ISP) with a backbone network.[54] They too claimed to have introduced a number of firsts: a first commercial connection to the Internet (1988); commercial application-layer firewall services for Internet Protocol (IP) Networks (1992); significantly higher Internet backbone access speed level, from a T-1 (1.544 Mbps) in 1993 up to the current 10 Gbps OC-192c level (1993); designed and installed the first dedicated multi-point Internet Protocol Virtual Private Network (IP VPN) Service (1994); the first profitable ISP (1995) and the first ISP to offer Extranet VPNs and Web Hosting services (1996). That same year WorldCom bought Uunet (Appendix 5).

MCI/Worldcom introduced commercial Internet traffic on a backbone network at OC-192 speed of 10 Gbps (2000) and initiated an all optical network (Terabit Challenge) to optimize use of available bandwidth (2001).[55] In the past five years, Worldcom also focussed increasingly on infrastructure. In 1997, they had the first undersea (Gemini) cable system network to carry production traffic, connecting city centres in New York and London. In 1999, it began building the Southern Cross Cable Network, the first undersea cable network system primarily for Internet and data use between the United States, New Zealand and Australia.

A more comprehensive study of international developments would reveal that a number of Worldcom's claims about being first are open to question. For instance, already in 1994, Deutsche Telecom produced a T3 ATM connection between Berlin and Osaka using a satellite connection. During the G7 Exhibition and Conference on the Information Society (Brussels 1995), there were Canadian ATM demonstrations with a 27MB throughput linking Ottawa, Vancouver and St John with Brussels via Berlin using the Canadian Advanced Network for Academic Research for Industry and Education (CANARIE). Similarly there have been important Japanese demonstrations on the Asian Network of Centres of Excellence for Digital Silk Roads led by the National Institute for Informatics (Tokyo). Europe's TERENA and GEANT networks have introduced a number of firsts.

A full account of such parallel developments would take us far beyond the concerns of this essay. The point that concerns us here is that, like AT&T, MCI/Worldcom was extremely active in the development of the Internet as we know it today. It is also noteworthy that two weeks after Worldcom's bankruptcy, its customer base was taken over by Verizon (formerly Bell Atlantic).

5. Baby Bells and Verizon

After the "breakup" of AT&T, seven Regional Bell Operating Companies (RBOCS) were formed. After the Telecommunications Act of 1996, regional Bell companies had to open their local markets to competition.[56] By 22 May 1997, NYNEX announced that it reached an agreement with AT&T, allowing the nation's largest long-distance company to offer local telephone service in NYNEX's local market.[57] In short, what had become the territory of the Baby Bells was becoming anew the territory of AT&T. As noted by Clay Shirky, and cited above, a similar motivation led AT&T to buy Media One.

Meanwhile, in the course of the past two decades the seven Baby Bells became four (figure 1). Southwestern Bell acquired Ameritech and Pacific Telesis.[58] US West[59] sold its wireless operations to Air Touch Communications. Airtouch, subsequently joined with parts of Primeco, General Telephone and Electronics Corporation (GTE), and Bell Atlantic to form a Code Division Multiple Access (CDMA) network, in conjunction with Vodafone, called Verizon Wireless Company "the largest nationwide wireless voice and data network and approximately 30 million customers."[60] Another of the Baby Bells, Bell Atlantic Corp. acquired NYNEX (1997) and merged with GTE Corp. to form Verizon (2000), which now represents a major force with approximately 248,000 employees.[61]

The bankruptcy of KPNQWest in 2002 and accounting problems analogous to Enron[62] at Qwest (formerly US West) are striking. When the old AT&T was divested into the seven Baby Bells, US West (now Qwest) had the largest area of land of any of the RBOCs. Qwest joined with KPN in the Netherlands to create KPN/Qwest, with the largest optical network in Europe. The Denver based Qwest had one significant rival in the area:

	1984	2000	01.2002	06.2002
1.	Ameritech[63]	=6		
2.	Bell Atlantic[64]	Bell Atlantic	Verizon	Verizon
3.	Bell South[65]	Bell South	Bell South	Bell South
4.	Nynex[66]	=2		
5.	Pacific Telesis	=6		
6.	Southwestern Bell[67]	SBC[68]	SBC	SBC
7.	US West	Qwest[69]	QWest[70]	=2 ?

Figure 1. A history of the Regional Bell Operating Companies or Baby Bells (RBOCs).

Level 3 Communications, a fast rising company[71] with close connections to Enron[72] and the blessing of Warren Buffett.[73] Until recently, Global Crossing also was considered a serious company. Its "fiber optic network is unmatched in reach and breadth. Nearly 100,000 route miles join more than 200 cities around the globe."[74]In 2002 it was bankrupt and interestingly enough both Level 3 and Verizon were among those to bid for Global Crossing.[75] Richard Perle, a defense advisor to National Security agency and on the board of Autonomy,[76] played a profitable role in selling Global Crossing. In light of criticism, he resigned his post as security advisor.[77] On August 18 2002, Hutchinson Telecommunications and Singapore Technologies Telemedia acquired 61% of Global Crossing for a bargain.[78] In March 2003, Global Crossing appeared as if it might re-emerge out of the ashes.[79]

Until recently, MCI/Worldcom was also considered a serious company (cf. section 2 above). On 4 April, 2002 it was awarded a $450 million Defense Research and Engineering Network (DREN) contract.[80] Worldcom also bid for a 3.5 billion Federal Aviation Authority (FAA) contract to upgrade the country's air traffic control communication. However, on 16 July, 2002, the FAA awarded the contract instead to Harris Corporation (of Melbourne, Fla., which has links with Jeb Bush),[81] which led a team of brand name telecom firms, including the "Baby Bells" Verizon, SBC and BellSouth Corp (which also has links with Governor Jeb Bush),[82] as well as Defense contractor Raytheon Technical Services Company.[83] On 21 July, Worldcom filed for bankruptcy.[84] On 26 July, 2002, Verizon Wireless Inc.[85], the largest U.S. mobile-phone company, announced it would "take over the accounts of customers now billed by bankrupt WorldCom Inc."[86]

In 1984, the year that AT&T was divested, Arun Sarin began his telecommunications career at Pacific Telesis Group, working in particular on cellular business acquisitions. This led to AirTouch Communications, where he became CEO before Airtouch merged with Vodafone in 1999.[87] In April 2000, Mr Sarin became CEO of Infospace "a leading global provider of infrastructure services for wireless devices, merchants and Web sites,"[88] with links to Verizon and VeriSign.[89] In 2000, Arun Sarin also outlined his vision of how the

Internet and telcos could link together in the future. Not surprisingly his firm, Infospace has a serious role in that vision. Significantly the carriers in that vision are former Baby Bells (Verizon) and AT&T (figure 2).

Is it just coincidence to note that Arun Sarin remained on the board of Vodafone and went on to replace Sir Christopher Gent as the head of Vodafone in July 2003?[90] Is it just coincidence that Vodafone was bidding for CEGETEL to capture control from Vivendi Universal? Is it just coincidence that CEGETEL's other shareholders, notably SBC Communications, complied so swiftly with Vodafone's takeover offer – especially as SBC has the following interfaces: SBC Southwestern Bell, SBC Ameritech, SBC Pacific Bell, SBC Nevada Bell and Cingular (Bell South)?[91] Does the CEGETEL takeover ring a (baby) bell for A.T.T.? For memory it was SBC, which acquired Prodigy and holds a small stake in Yahoo!

In January of 2001, Sarin left Infospace. In February 2001 the Venture Capital firm Accel Partners, based in Menlo Park, California, and leveraged-buyout (LBO) giant Kohlberg Kravis Roberts (KRR), based in New York, "announced a new joint venture called Accel-KKR Internet. Its goal is to create companies with integrated online and offline assets, especially in the burgeoning business-to-business arena." Arun Sarin soon became the CEO of the new venture.[92]

Accel-KKR is one of the few firms which is reportedly happy with the enormous bankruptcy woes among the telecoms. On the surface this is because these impoverished telcos represent a bargain for enterprising investors, bankers and leveraged buyout persons.[93] Is it not curious, however, that one of the protagonists in this game should be someone who began with one of the Baby Bells? It almost looks as if the disbanded group is reconfiguring. One forces the competition into bankruptcy or preferably leveraged buyouts then takes them over at a bargain price.[94] Just after one has raised considerable money on the argument that they are the cash cows of the future, one spreads the word that the telcos are in desperate straits and complains that they cannot survive without subsidy.

Such complaining is effective. In 1996 it led to the Telecommunications Act, which helped AT&T return to former markets. Some believe that the Internet Freedom and Broadband Deployment Act (2001)[95] will solve these problems. Others fear that this is another subtle step of the major telco(s) to regain the position they once had. Indeed, some expect that it will accelerate that process. Between 1984 (when AT&T was divested) and 2000, the seven Baby Bells reconfigured into four.

With the possible bankruptcy of Qwest, the number of Baby Bells will have dwindled to 3. At the same time Qwest is conveniently looked after by Verizon (= 3 former Baby Bells in one: Bell Atlantic + Nynex +Qwest). A futurist could predict that the number of Baby Bells will decrease. One can almost see coming the argument that because the telco situation is so desperate and utterly hopeless, the only hope is to allow the Baby Bells and AT&T to save the day using the entirely modern idea of a monopoly.[96]

6. BellCore and Science Applications International Corporation (SAIC)

A fourth essential player in these developments linking telephony and the Internet is perhaps less known but not less important. The same year that the Internet began in the United States, a former member of Los Alamos Laboratories founded the Science Applications International Corporation (SAIC, 1969, cf. Appendix 6). Within a year they were using computers to identify two branches of computer-related growth: large-scale systems analysis and modeling; 2) development of integrated software, including provision of data-processing services and training based on the latest in computer technology.[97] During the next decade their concerns were increasingly linked to diverse military applications with one common thread: the use of computers and the development of advanced specialized software.[98]

By 1987, SAIC was a national leader in Computer-Aided Logistic Support (CALS).[99] By 1997, SAIC had become "one of the world's top systems integrators, one of the leading research and development firms in the U.S., and a major builder of the country's defense information infrastructure. SAIC also was one of the largest providers of solutions in information technology, data security, electronic commerce, Internet and Intranet services, and one of the largest and most successful government contractors." National security services remained SAIC's largest business area.[100]

To understand how these developments become crucial for our story a short excursus is necessary. Formal naming of the Internet came under the auspices of Network Solutions when it was founded in 1991. In 1993:

> Network Solutions was awarded, through a competitive bidding process, a 5-year Cooperative Agreement with the National Science Foundation to continue this work…Network Solutions managed both the front-end registration services (now known as registrar services) and the back-end addressing, resolution, and distribution services (registry services) for .com, .net, and .org, domain names, through an agreement with the Defense Data Network-Network Information Center (DDN_NIC).[101]

In 1994, the official body for Internet naming became the Internet Assigned Names Authority (IANA).[102] In 1996, the Science Applications International Corporation (SAIC) bought Network Solutions. This soon led to complex developments linking Network Solutions, SAIC, and Verity (Appendix 7). In 1997, the same Science Applications International Corporation (SAIC) bought AT&T's BellCore and soon after renamed it Telcordia Technologies.[103] SAIC now employed some 30,000 professionals and had official sales of $4 billion. (cf. Appendix 5).

With respect to operations and business support systems (OSS/BSS), SAIC teamed up with web Methods to create a RapidApps™ integration platform for companies with critical time-to-market needs and/or limited budgets.[104] In April 2001, SAIC and webMethods, were among the partners along with VeriSign, Microsoft, Baltimore Technologies, HP, IBM, IONA, PureEdge and Reuters, to announce a second-generation Public Key Infrastructure (PKI) Standard known as XML key management specification (XKMS).[105] Hence, SAIC, working with the RSA and Verisign, is deeply into security.

During the fiscal year 2000, SAIC launched new initiatives and expanded its business in information technology (IT), e-commerce, and next generation networks. Mergers expanded SAIC's scope considerably,[106] although these initiatives remained small compared to its military contracts. In 2002, SAIC won – or pre-negotiated - major contracts in three commercial growth areas including: application hosting, wireless technologies, and health. Already in February 1999, Bellcore (now SAIC's Telcordia) announced with the Toshiba Corporation a project to create: "technologies necessary for the integration of wireless and Internet communications,"[107]

Also in 1999, the same Bellcore, now as, SAIC's Telcordia Technologies, signed "an agreement with Sprint to develop the core software for a visionary new direction in networking that enables the integration of telephone calls and data service over Sprint's Integrated On-Demand Network."[108] By 2002, Telcordia Technologies was "providing mobility solutions and won contracts to provide OSS software components and intelligent network platforms."[109]

Telcordia Technologies, owned by SAIC, is a serious player. It holds key patents for broadband data communications technologies like Asynchronous Digital Subscriber Line (ADSL), Asynchronous Integrated Network (AIN), Asynchronous Transfer Mode (ATM), Integrated Subscriber Digital Network (ISDN), Frame Relay, Switched Multimegabit Data Service (SMDS), Synchronous Optical NETwork (SONET), and Video-On-Demand (VOD). It has invented, developed, implemented or maintains software on which 80% of the U.S. telecommunications network depends[110] and its vision is to be "THE major enabler - worldwide -of tomorrow's Next Generation, packet-based, data centric network model and information-based, e-commerce economic model."[111] AT&T in its various guises, and its partners are extending well beyond telephony and the Internet into four further areas, namely, a) telephone number mapping, b) domain name systems, c) education and d) Next Generation Internet.

7. Telephone Number Mapping or Electronic NUMbering (ENUM)

In 2000, Telcordia and Verisign committed themselves to Telephone Number Mapping or Electronic NUMbering (ENUM).[112] By coincidence, Lucent, which continues to see itself as an AT&T lab, also sees ENUM as their solution for internet telephony problems. Sometimes it seems as if AT&T and SAIC/Telcordia are two faces of a same strategy. The Telephone Number Mapping (enum) initiative entails other players such as the Internet Engineering Task Force (IETF) and the International Telecommunications Union (ITU):[113]

> ENUM is the name adopted by the telephone numbering working group of the Internet Engineering Task Force (IETF) to describe a mechanism using the Internet Domain Name System (DNS) to map E.164 numbers to Uniform Resource Locators (URLs). E.164 is an International Telecommunication Union (ITU) standard that describes the format of telephone numbers used around the world.
>
> The proliferation of communications devices at our disposal has created a problem: A multitude of devices that access different networks (PSTN and IP) through different address conventions (phone number, SIP address, email address, etc.) and

input capabilities (telephone, computer, PDA). This problem has created the need for a method which allows easy accessing of the growing list of emerging devices, regardless of the platform to which they are connected or which device is being used to access the information. ENUM is a solution to this growing problem: a convergence enabler that bridges the PSTN and IP worlds.

There are many service applications that will be facilitated by the ENUM standard. One of the more prominent ideas is the establishment of a single contact number for individuals. This would, for example, allow the business card of the future to contain a single number rather than a long list of addresses for home phone, office phone, fax, cell phone, and email. Various services will use the Internet to translate that one number into service specific addresses. Some experts believe that ENUM has even broader potential. A recent article in Communications Week International described ENUM in these terms.

> ENUM seems destined ultimately to emerge as the most important new Internet platform since the World Wide Web - perhaps even eclipsing it in long-range importance. A measure of its broad significance was the Internet standards speed record recently set by the initial adoption of the ENUM specification on the road to an Internet standard.[114]

On the surface this promises to be a magnificent development. The ENUM standard could establish the framework for a global numbering system, which can ultimately enable persons to use only one number to access all of their communication devices including cell phone, fax, phone, and e-mail. But who precisely is in charge? We are told that:

> The Internet Architecture Board (IAB) and ITU-T Study Group 2 are discussing collaboration on the operational, administration and delegation issues related to deployment of ENUM protocol-based services. This requires extensive consultation with administrators of resources derived from the international E.164 numbering plan including national and integrated numbering plan administrators.[115]

At a practical level, it is the IETF, which is in control. But the situation is more complex. In North America, the ENUM initiative arose from an agreement between Telcordia[116] and Verisign. If the plan of Telcordia and Verisign succeeds, it looks as if the traditional naming activities of organizations such as the International Telecommunications Union (ITU) and the International Standards Organisation (ISO) may now come exclusively under US jurisdiction. Some have seen the conclusions of the ITU meeting in Marrakech, September 2002 as a new basis for a continuing European role.[117] Meanwhile the ENUM Forum is dominated by Telcordia, AT&T, Illuminet (now owned by Verisign)[118] and Neustar (which has an alliance with Telcordia)[119] and includes Worldcom and the International Internet Telephone Organization (IITO).[120]

8. Domain Name Systems (DNS)

Officially the question of Domain Names has formally been under the jurisdiction of the Internet Assigned Names Authority (IANA) since 1994. When IANA was being reformed in 1998, among the players in this field were the Policy Oversight Committee and the

Council of Registrars (POC/CORE) ,[121] who suggested the development of a global "whois" search by name. There were many debates. President Clinton appointed Ira Magaziner to advance U.S. interests but his approach did not work in Europe and especially in Geneva.[122] Objections were made on the basis of privacy issues,[123] but interestingly enough the idea of a universal Whois or Uwho is now part of Verisign's official plan. There are also other players. When Dr. Robert Kahn, one of the founders of the Internet, was asked in 1998 about the possibility of unified network directories he noted that:

> One possible way to accommodate this is to use the existing Handle System technology that was supported by DARPA and has been operating on the Internet for the past several years. This could be incorporated with essentially no change in the way the existing DNS system operates. A major feature of this System is that it provides the necessary coordination mechanisms for a unified directory system and can easily support multiple registrars for a given TLD [Top Level Domain].[124]

Dr. Kahn, who is also the President and CEO of the Corporation for National Research Initiatives (CNRI, see below), is also a protagonist in the development of Digital Object Identifiers (DOIs):

> CNRI has been providing both registry and directory manager services for an alternative identifier system (known as Digital Object Identifiers or DOIs) on the Internet in conjunction with publishers in the U.S. and Europe. The technology was developed with support from DARPA and is being used by other groups such as the Department of Defense and the Library of Congress, and in various digital library research efforts. The registry is a single logical entity that is distributed in multiple locations and supports open interfaces. Multiple directory managers will likely be added by the publishers in the coming year, but the basic identifier system can be used by others as well.[125]

In short, the naming game is not only about telephony and computers. In July 2001, the Korean company Enpia applied the Digital Object Identifier (DOI) to commercial e-business solutions. By co-incidence, the CEO of Enpia, is also the vice-chairman of the Digital Content Forum, vice chairman of the Korean E-Book Industry Association and vice chairman of the Digital Music Standard Group.[126] The DOI via Content Directions has also made deals with Microsoft's Corbis.[127] Meanwhile the CEO of Content Direction.com[128] claims that

> As the DOI spreads from publishing to other industries and becomes (over time) the primary mechanism by which people find and access structured information on the Internet, I believe that every company in every industry will want to assign DOIs to their objects. This represents a tremendous opportunity for CMS [Content Management Systems] and DAM [Digital Asset Management] vendors.[129[

This will be especially true in a MPEG 21 environment with its multi-media meta-data DRM abilities.[130[Some see the DOI as replacing earlier visions of an Universal Resource Name (URN).[131] Not surprisingly, DOI extends to the library world also. As will be shown presently this explains why the Dublin Core Metadata Initiative of the Ohio Library

Computer Center (OCLC) is part of a much bigger picture. Full consideration of the names and naming debate is beyond the scope of this paper and will be considered elsewhere.[132] Even so, in the present context, it is important to consider briefly the realm of education.

9. **Education**

One dimension of the naming discussions has been that the .gov domain should go to the government, the .org to ISOC and that the .edu domain should come under the auspices of Educom which is connected with Educause. A former head of Educom, Mike Roberts, has also been a head of ICANN. It can hardly be a co-incidence that in this same period, Educom, in conjunction with the IEEE, has been working on a National Learning Infrastructure Initiative[133] (NLII) to create an Instructional Management System (IMS) "to enable an open architecture for online learning."[134] This entails the use of a Learning Object Model (LOM), which is used by the Global Learning Consortium.[135[By co-incidence the US Army also uses a Learning Object Model (LOM).[136]

In January of 2001 the American Society for Training and Development (ASTD) in its Learning Circuits had a simple newsbyte about Standards Movement Gains Support: "The agreement between a committee under the IEEE [Learning Object Metadata Working Group] and the Dublin Core Metadata Initiative (DCMI), pledges coordination of their efforts to create a set of metadata specifications."

> The standards drive has also picked up some significant endorsements from learning management technology providers. Three makers of LMS [learning management systems] technologies, including category-leading Saba[137], said they are at various phases of incorporating the Sharable Courseware Object Reference Model (SCORM) into their systems. SCORM is a methodology developed by the federal government's Advanced Distributed Learning (ADL) initiative under which learning content can be designed and described to allow it to interoperate with different LMS systems.[138[

The same Learning Circuits of January 2001 contained a seemingly unrelated newsbyte that: "PricewaterhouseCoopers…and its team beat out rival groups for the $453 million contract, including the team of Click2learn.com and SAIC, as well as Arthur Andersen, EDS, and IBM."[139]

One of the rival groups mentioned, SAIC, is the developer of the Sharable Courseware Object Reference Model (SCORM) mentioned in the preceding newsbyte. SAIC is the corporation that bought Network Solutions, owns its spinoff Verisign, Bell Labs and via Telcordia is leading the Electronic NUMbering (ENUM) initiative in North America. SAIC lost the contract in January 2001. But the US Army has since become more involved with SAIC's SCORM.[140]

The scope of the game becomes clearer when it is realized that the same SAIC is also involved with business objects where they are working with IBM, with SAP –which was started by former IBM employees—and entails bodies such as the Object Management Group (OMG), Open Applications Group (OAG), Workflow Management Coalition

(WfMC), E-business eXtensibe Markup Language (ebXML) and Universal Description, Discovery and Integration of Business for the Web (UDDI).[141]

10. Next Generation Internet and the Grid

In 1998, SAIC made an alliance with Cisco Systems in support of Next Generation Networks. In 1999, Telcordia and General Electric (GE) Information Services activated "the telecom industry's first Internet-based interconnection clearinghouse to facilitate critical business transactions between telecom carriers and to facilitate national telecommunication interconnection,"and launched the Next Generation Network Initiative.

There are also network dimensions to this vision. As noted earlier, MCI introduced the first commercial connection to Internet. In 1989, the National Science Foundation Network (NSFNET) launched, a high-speed digital network capable of transmitting large volumes of data among academic computing centers throughout the country, forming the foundation of today's Internet. MCI played a leading role in this cooperative effort. CompuServe e-mail service was the first to be connected to NSFNET.

In 1996, Worldcom bought Uunet the largest ISP at the time (cf. Appendix 4-5). In 1997, Worldcom bought MCI and helped to create an undersea cable system network linking the US and Europe. In 1999, Worldcom began an undersea cable network system linking the United States, New Zealand and Australia. In 2001, Worldcom created the Terabit Challenge to optimize available bandwidth on a complete optical network.[142] Not surprisingly Worldcom was also one of the initiators of the Internet2 project also known as the Next Generation Internet (NGI) initiative which, beginning in April 1998, linked 115 universities and research institutes – a number which has since grown to 202 in June 2003. The Next Generation Internet entails organizations such as Internet2 and the University Corporation for Advanced Internet Development (UCAID) whose advisory groups reads like a Who's Who of the Internet.[143]

The NGI network is based on Very High Performance Backbone Network Service (vBNS)-Net which was originally established to link the five civilian supercomputers, namely, the Cornell Theory Center (CTC), the National Center for Atmospheric Research (NCAR), National Center for Supercomputing Applications (NCSA), Pittsburgh Supercomputing Center (PSC), and the San Diego Supercomputer Center (SDSC).[144] It will be recalled that the other key proponent of Next Generation Internet is Telcordia, or rather its mother company, SAIC.[145] In 2000, Worldcom planned a merger with Sprint, which was blocked by the EU.[146]

To understand the global dimensions of the scheme it is useful to recognize that those involved in the NGI are also the proponents of new forms of parallel computing called grids.[147] As with the Internet, this is an idea which began in Europe. The Large Hadron Collidor at the European Organization for Nuclear Research (CERN), which begins operations in 2005, will generate petabyte/sec amounts of information which no single computer in the world today can hope to handle properly. Physicists at CERN thus mapped

out a vision for a new level of parallel, distributed computing to address the challenge. The NGI[148] and the Grid Project are linked with the European GEANT[149] project and the

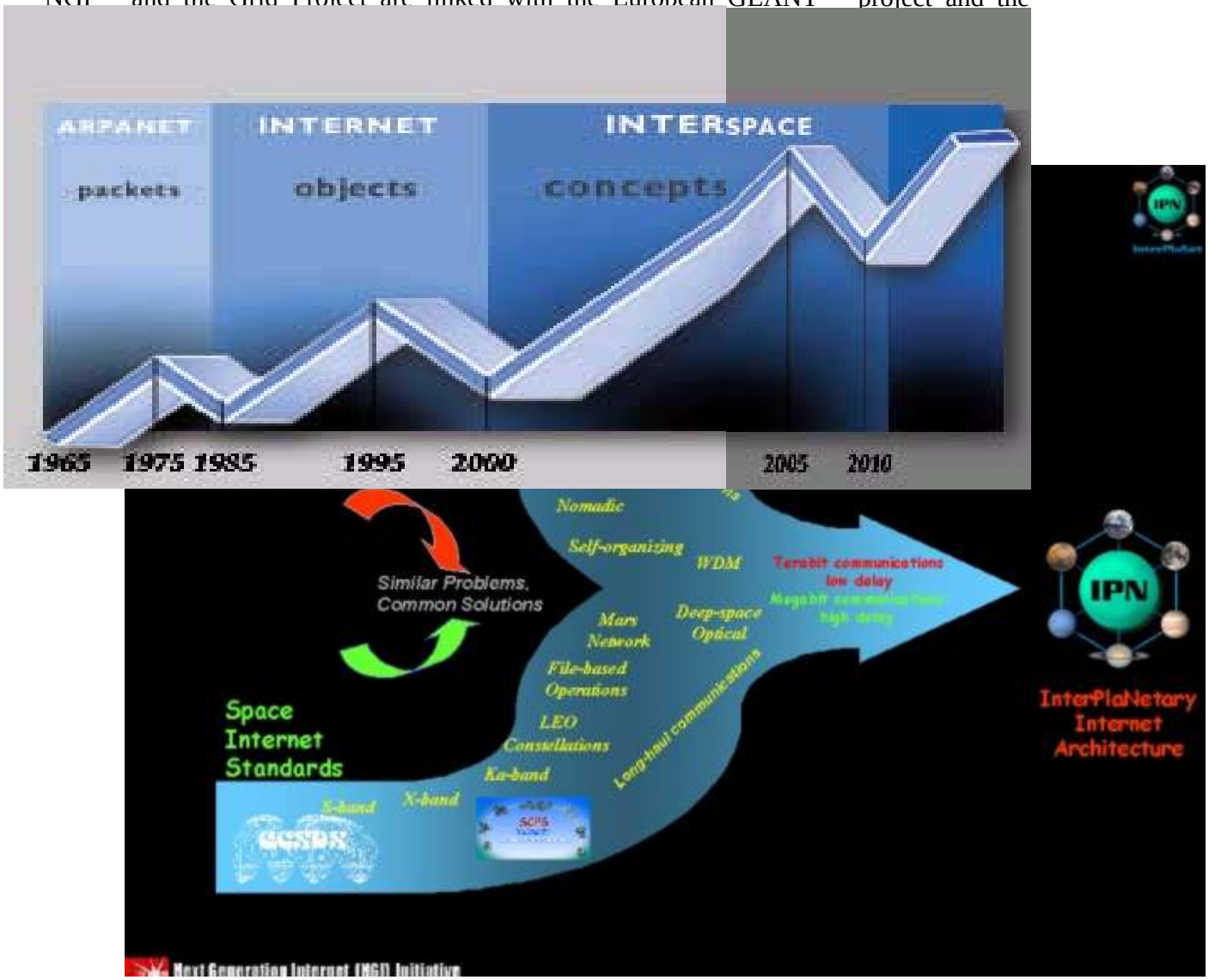


Figure 3a. ARPA'S vision of how the Internet will evolve into the Interspace and NASA's vision of the Interplanetary Internet. [151].
Ian Foster, an immensely charming physicist at the Argonne National Laboratories (ANL) and his colleague Dr. Kesselmann at the University of Southern California (USC/ Information Sciences Institute) made this idea accessible in a very useful book.[152] Ever since the idea of the grid has become popular on the hype charts. Major corporations such as IBM and HP are now fully committed to making both the Next Generation Internet (NGI) and the grid vision a reality especially in the context of e-science

At INET 2002 (Arlington, June 2002) a very senior scientist from Caltech, Harvey Newman, modestly pointed out that it would really require investments of $1 billion per year to make this work. The big vision is "big bucks," though doubtless this will be seen to be modest compared to the total costs related to full IPv6 mandated Internet Protocol Security (IPSec) and Domain Name System Security (DNSsec).

All this is closer to telephony, computers and naming than it may seem. The Next Generation Internet (NGI) is leading to a Next Generation Information Networks (NGIN) which entails, as Gregory Pankauski, has recently explained in *The Next Next Generation in Learning,"* a virtual field trip that takes 200,000 students to the Louvre…. The network's Web-based tools will include videoconferencing, which will allow students in the district's more than 11,000 classrooms to share information."[153]

All this is happening in the context of wonderfully politically correct sounding bodies such as the Internet Educational Equal Access Foundation (IEEAF).[154] Meanwhile, the same conquest of names, which brings a few hundred millions to Network Solutions in its new guise as Verisign; more hundreds of millions to SAIC's Business Objects; more hundreds of millions for a Learning Object Model applied to military training especially in the army, could now, via global networks bring many more billions through a Learning Object Model (LOM) applied to education around the world. In this context, European alternatives such as Educational Modelling Languages (EML), appear like minor distractions.[155]

As was suggested earlier, the Next Generation Internet (NGI) plan is connected with the Dublin Core Metadata Initiative owned by OCLC, which has similar goals of universal application in the library world. Already today, the OCLC Dewey Decimal Classification system is used in more than 26,000 libraries around the world. If this plan succeeds the applications to science, business, and military training will be applied to all of education.

Over the past few years, the United Nations Educational Scientific and Cultural Association (UNESCO) has been working on a global portal for Culture and E-learning. Meanwhile, the World Bank has been creating a (Global) Development Gateway "where worlds of knowledge meet"[156] which also has an e-learning portal that focuses largely on distance learning solutions from the United States. UNESCO and the World Bank offer two alternative visions of the world: one multilingual and multi-cultural: the other uni-lingual and uni-cultural.

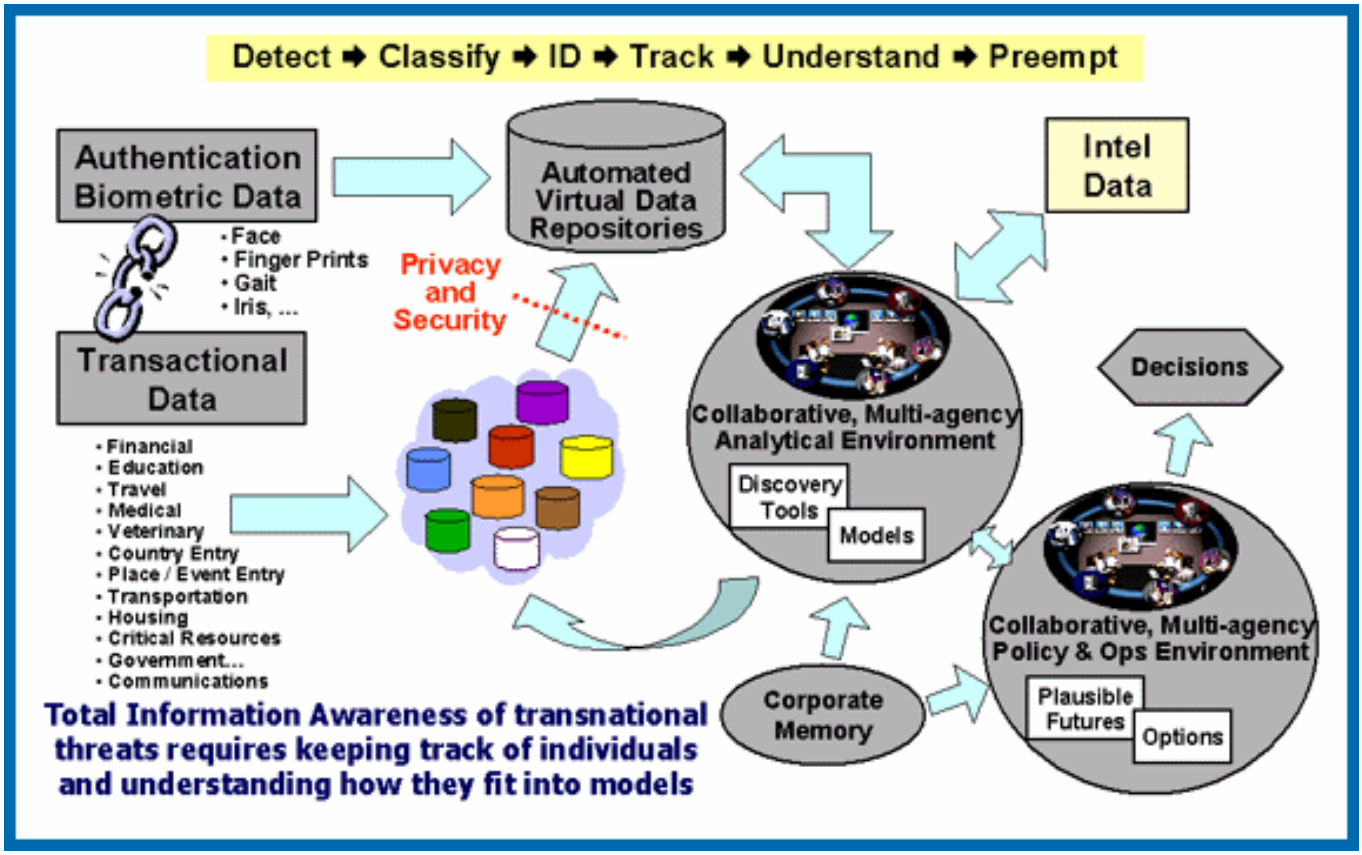
One might be tempted to believe that the plans for a Next Generation Internet are yet another example of the hype that so often accompanies the high tech field. On closer study there is serious evidence to the contrary. In the early 1990s, the Japanese Nippon Telegraph and Telephone (NTT) developed a prototype multimedia Multi-User Dungeon (MUD)-like service, Interspace, which allowed people:

> to navigate through a graphically rendered space and communicate with other people by text, telephone or video. The system is designed to enable distance education, as participants "attend" lectures and discussions, or catalog shopping, as participants wander through a virtual shop and talk to sales people. The system is implemented as a client running on a PC that downloads scene renderings from a central server over an ISDN link. Narrow bank ISDN is also used to support voice and visual communication….NTT is prototyping a network service in collaboration with several Japanese universities and with retailers.[157]

This was reported by US observers in 1994.[158] Now futurists such as Oliver Sparrow are predicting the advent of an interspace in the context of telecommunications.[159] Nor is this just a vague prediction. It is being worked on by the Defense Advanced Research Projects Agency (DARPA), which is concerned with creating the net of the 21st century. This effectively entails redesigning the whole of the Internet as we now know it today. This project also explains increased top-level military and political U.S. understanding and their new making IPv6 implementation and migration a priority. DARPA describes the Arpanet as a first wave, the Internet as a second wave and foresees the Interspace as a third wave for which a first prototype was developed in 1998 (figure 3a). The Interspace:

> will bring the level of analysis, of correlation of knowledge. It will move past search of individual repositories, beyond federation across repositories, to analysis of diverse groups of information across sources and subjects. To develop the new technology needed for this new wave 10 years hence, one needs to begin now so that widespread research prototypes can be available for the new millennium supporting global semantics. In this third wave, the Interspace, there will be distributed services to manipulate concepts across domains just as the ARPANET had distributed services to transfer files across machines and the Internet is having distributed services to transfer objects across repositories. The Interspace environment supports fundamental manipulation of concept spaces: indexing and retrieval, grouping and sharing.[160]

Describing the *Interspace*[161] project in 1995 at the ASIS (American Society for Information Science and Technology) annual meeting, Dr. Bruce R. Schatz, who also developed the *Telesophy* project (see above p. 3), spoke of "building the WorldNet, every community big and small living in the interspace of all the world's knowledge."[162] By co-incidence, there is now an AT&T WorldNet service.[163] More recently the *Interspace* vision has led to *Medical Interspace Projects* (*Medspace*) which foresees systematic changes in medicine including virtual town



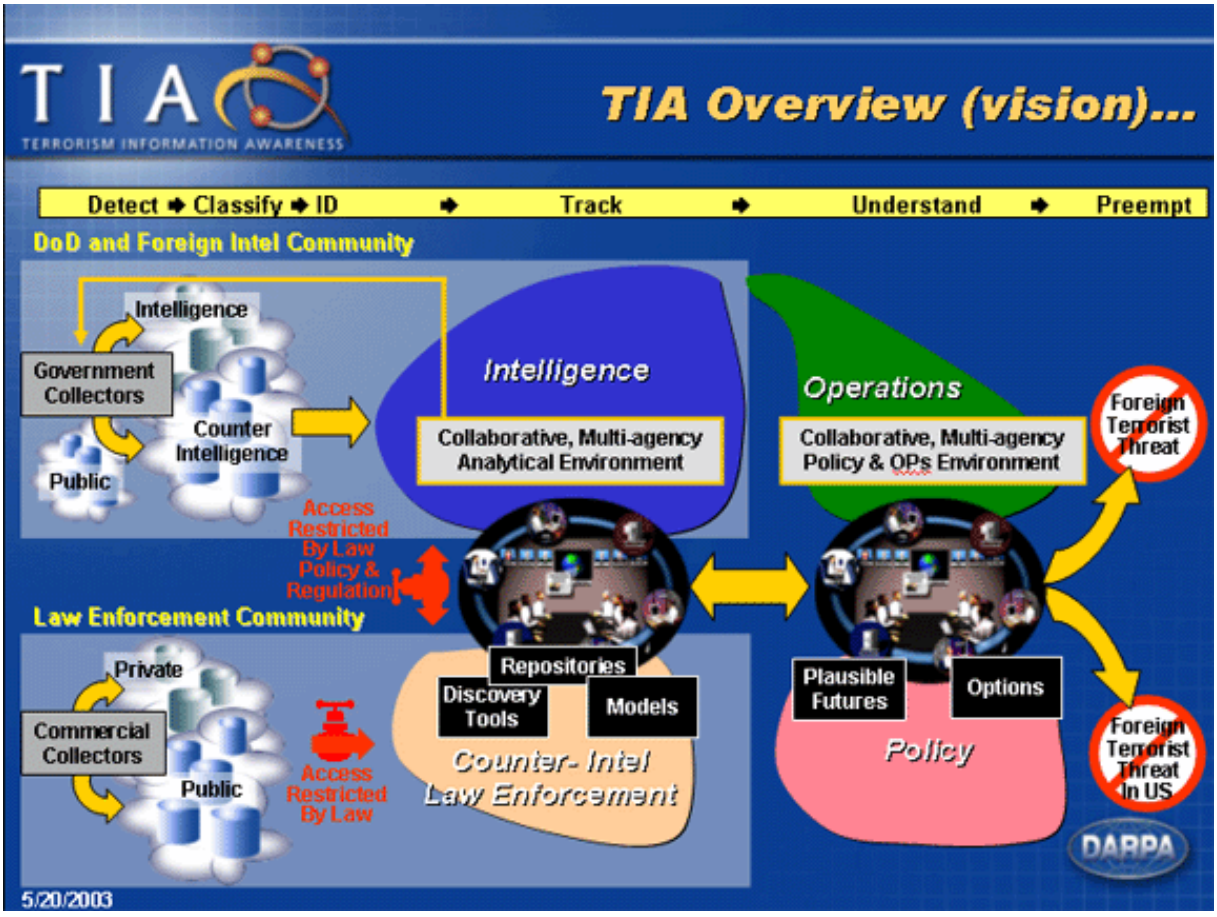


Figure 5. Two views of the Total Information Awareness now renamed the Terrorist Information Awareness (TIA) System headed by Retired Admiral John Poindexter.[164]

doctors.[165] Medspace "is developing research technology for semantic federation of community repositories and deploying that technology in a large-scale testbed for clinical medicine." For starters Medspace will make a semantic index of all of MEDLINE and BIOSIS. Semantic, in this case, has little to do with personal meaning. It entails mainly formal, subsumptive relationships such as whole/part.

If one looks more closely at the Interspace conceptual diagrams one finds interesting parallels with the Spatial Paradigm for Information Retrieval and Exploration (SPIRE) project[166] at the Pacific Northwestern Labs, particularly their ThemeView method and the methods being developed at Sandia Labs.[167] It is almost as if the advanced military labs of the Department of Energy are working on another stage of prototypes for the Interspace.

More recently, problems of terrorism have come to play an important role in plans for the future of the Internet. On September 19, 2001, a week after September 11, there was an article asking: "Can Cyber-Intelligence Prevent Real-World Terrorism?"[168] The author of the article acknowledged the Federal Bureau of Investigation's (FBI) Carnivore system (now called DCS1000), but noted that perhaps the most promising development was DARPA's Genoa Project, which "employs a combination of a cutting-edge search engine, sophisticated information harvesting programs, and P2P computing methods."

The article did not point out that the Genoa project, was developed jointly between DARPA and Syntek Technologies.[169] In 2001, Syntek was one of the companies to receive a Naval Sea Systems Command (NAVSEA) Multiple Award Contract (MAC) for 15-years, with a total ceiling of $14.5 billion.[170] At the time, the Vice President of Syntek[171] was John M. Poindexter, of Iran-Contra fame.[172] On February 13, 2002, Americans were warned that the nation was facing the threat of danger to homeland security. That same day, John M. Poindexter was appointed Director of the Pentagon's Information Awareness Office (IAO).[173] The IAO works jointly with the Information Exploitation Office (IEO). These two organizations will receive "a big chunk of the $48bn of the taxpayers' money George Bush is pumping into his war on the evildoers."[174] The IAO is already very active. Until recently it included eleven programs and one project (figure 4). A cursory look at their goals suggests an emphasis on military dimensions rather than information for the public good.

On 21 March 2002 the IAO made a Broad Agency Announcement (BAA) about a new Total Information Awareness (TIA) programme.[175] The deadline for the first round of submissions was 22 April although the call is supposedly open for one year.[176] On 7 August 2002, the Defense Advanced Research Projects Agency announced publicly that it would begin awarding contracts for the design and implementation of a Total Information Awareness (TIA) system (figure 5).[177] TIA had as its motto the phrase *Scientia est Potentia* (Knowledge is Power) and its symbol was the Masonic pyramid and eye which is well known from the American dollar bill.[178] The only difference was that the rays of the eye stretch out specifically over EurAsia and Africa and effectively to the whole world. TIA is the latest program[me] within the IAO. The Program Manager of the TIA system is John M. Poindexter:[179] "Grant applicants are warned that no money will be invested in "research that primarily results in evolutionary improvements to existing technology"; officials are committed to a fundamental redesign of technology."[180]

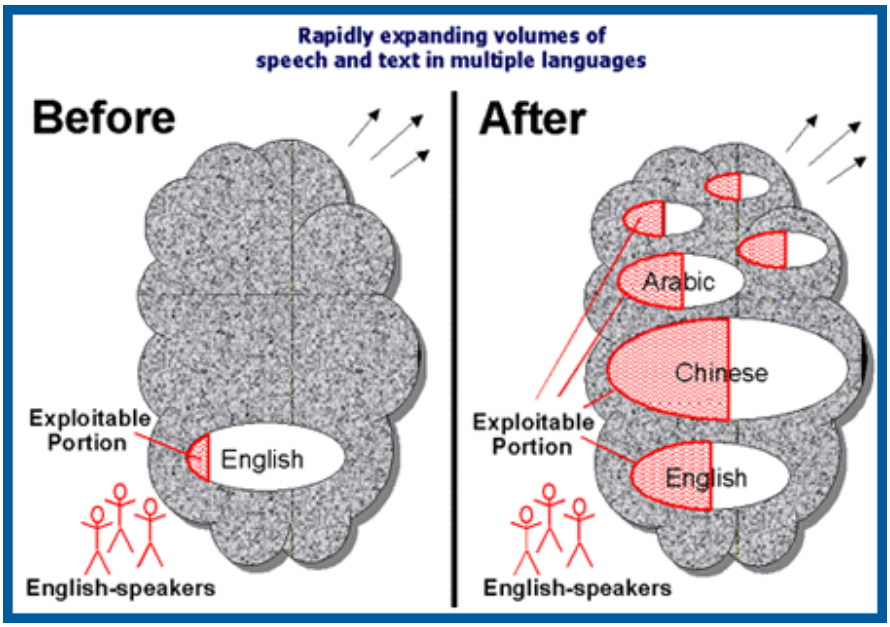


Figure 6. In the United States, the "Translingual Information Detection, Extraction and Summarization (TIDES) program is developing advanced language processing technology to enable English speakers to find and interpret critical information in multiple languages without requiring knowledge of those languages."[181]

In simple terms, the plan is to replace the Internet as it now exists with what some see as a thinly disguised spy machine. All this is happening with effectively no consultation at all outside America. A small group within the United States is treating the rest of the world as insignificant. The plan has met with opposition from within the US. On 23 January the Senate:

> voted in favor of the Wyden-Feinstein amendment to the current omnibus appropriations bill (Senate Amendment No. 59) which would block the deployment of any TIA program until it has specifically authorized and appropriated funds. Exceptions in the amendment allow a TIA program to be used to support a lawful military operation or a lawful foreign intelligence activity conducted wholly overseas or wholly against non-U.S. persons, it should effectively preclude the use of TIA inside the United States against citizens.[182]

On 24 January 2003, it was reported that the Senate officially voted to stop funding the TIA project.[183] On 27 January Share Me technologies The Mobile future Weblog reported: "As you may know the Senate killed the Total Awareness Inititative. However, the big Brother aspect of control and invasion of your privacy is still alive and now taking new roots at OASIS in the form of a new XMl format intitative called LegalXML Lawful Intercept XML (LI-XML)."[184]

Similarly a report on 29 January stated that TIA was not yet dead.[185] On 7 February the Electronic Frontier Foundation (EFF) urged support of the Wyden-Feinstein Amendment[186] and the same day Amercian Forces Press Service announced that TIA would go ahead under the supervision of two boards.[187] On 12 Febraury, 2003, the House and Senate of the US decided that TIA could not be used to spy on American citizens.[188] Nonetheless, on 3 May, 2003, DARPA "awarded a $3.5 million contract to Xerox Corp.'s Palo Alto Research Center (PARC) to create a privacy-protection system as part of DARPA's controversial Total Information Awareness program."[189] On 17 July it was announced that the Senate was blocking funds for TIA,[190] which launched a new series of reports that TIA was killed. But on 22 July there was a new note urging that that the TIA should be stopped and that it still required the decision of a joint House-Senate Conference committee.[191] A note on 23 July pointed to the ongoing threat to privacy posed by TIA[192] and on 24 July a note from the Department of Defense pointed out that TIA was too broad but intimated that it was necessary nonetheless.

11. Only English or Multilingualism?

Ten years ago the Internet was overwhelmingly English. Today the Internet is approximately 35% English, has Chinese as its second most important language; Japanese in third place, Spanish in fourth, German in fifth, Korean in sixth and French in seventh place.[193] The Internet as envisaged by the United States remains effectively a uni-lingual, uni-cultural phenomenon.

To be sure there are multilingual projects in the United States. But their purpose is very different. In the military, there is a quest to develop new tools, which allow communication without knowledge of other languages (figure 6). In the American vision, the worlds of e-business and e-science require global, standardized solutions in which variations of culture and language at the national, regional and local level play no significant role. In their high industry, there is a quest for tools, which are independent of language and culture:

> A major task will be to create tools independent of language and culture that can be instantly used by anyone, regardless of location or national origin. Tools will have to be developed that allow for effective remote interaction. Collaboration technologies will require models of the dynamics of human interactions that can simulate behaviors, characteristics, and appearances to simulate physical presence.[194]

The US is perfectly free to develop a comprehensive vision of the Internet that affects the whole of telephony, libraries, publishing and education within their own country. The problem is that this US vision foresees controlling not only their own education but the edu. domain for the entire world, assumes that the future of education and e-learning will be in the image of their own uni-lingual, uni-cultural "melting pot" model of reality. Indeed to assume that a vision of 4.5% of the world, or rather the vision of a few thousand individuals in that great nation, should determine the future of world learning is at odds with the US's own quest for democracy. Much more than money and profits are at stake. Here a lack of vision could destroy trust and cultural diversity, which are a basis of culture and civilization everywhere in this global village.

In these developments there are serious contradictions between 1) a rhetoric of a universal Internet for everyone; 2) a plan whereby the US version of the Internet is exported globally and 3) the realities of the today's Internet, which includes well over 70 of the world's 6,500 languages. When the Internet Society tells us that the Internet is for everyone, does it perhaps believe that a US version of the Internet should serve as a model for everyone?[195] If so which of the three alternatives will win: NASA's Interplanetary Internet, ARPA's *Interspace* or the new *Total Information Awareness* (TIA) system?

All this poses important challenges for Europe, Asia and the rest of the world. When the United States painted a vision of an Information Highway, Europe insisted on the need for an Information Society[196] and some even spoke of a Knowledge Society. While the United States continues to assume that the Internet is to all intents and purposes in and for English, Europe has been very conscientious in making the key documents of the European Union available in at least 11 languages. Faced with this new vision it again has a choice. It could blindly follow the American solution, or it could remember its roots and insist on a multi-lingual, multi-cultural, open source model for the future of the Internet, which is becoming intimately linked with the future of knowledge and culture.

12. Six Trends

In all these developments, is it is possible to discern six important trends, before turning to consider the very big picture. First, the telcos, computer companies and carrier equipment companies at least in America are working together with new intensity, as if the carriers were shutting out or taking over the roles played by the content owners and home entertainment companies.

Second, it is striking also how computer companies (IBM, Compaq/HP, Sun, Microsoft) and the carrier equipment companies (Cisco), have a disproportionate visible representation in organisations such as IETF, ISOC and W3C. On closer inspection, telcos such as AT&T also in their guise as Lucent and Telcordia, play a major role. John Klensin (ATT) was also head of the IETF.[197] Now, Leslie Daigle (Verisign) is head of IETF. Pipelines seem to be triumphing over content and creativity.

Third, these links between telcos, computer companies and carrier equipment companies are becoming ever more linked with accountancy firms, notably the big five. The acquisition of PriceWaterhouseCoopers by IBM is merely the latest development in this context.[198]

A fourth trend involves the bankruptcies. It is striking how many competitors of AT&T are all going bankrupt or are supposedly on the verge thereof: British Telecom, Deutsche Telecom, France Telecom, KPN Telecom, more recently MCI/Worldcom, Adelphia, Winstar Communications, Williams Communications and Metromedia Networks, XO, the ousting of Vodafone's head,[199] with rumors about Qwest and Sprint?[200] By co-incidence Vodafone's competition for third generation (3G) networks in Britain is Hutchinson (linked to AT&T).

These bankruptcies are spreading to other players outside the inner club amongst carriers (Global Crossing and rumors about Alcatel) and content holders (e.g. Kirch, Vivendi/ Universal, and recent leadership changes at Bertelsmann)? It is instructive that industry observers assure us that the string of bankruptcies, the shakeout, as they say in America, is by no means over. For instance, in June 2002, Red Herring, commenting on the recent demise of PSINet and 360Networks, reported that "More should follow' and lead to "*A massive wave of consolidation.*[201]

In the meantime, as already noted, Williams is bankrupt and Level 3 has generously offered to take it over. An article in Business Week helps us to understand some aspects of the dimensions in play:

> Banks issued more than $320 billion in loans to the telecom industry between 1999 and 2001…The trouble began after the Telecommunications Act of 1996, which started a $1.3 trillion avalanche of lending by investors and bankers eager to finance a host of upstarts that would supposedly take on Verizon Communications (VZ), AT&T (T), and other established carriers.[202]

A fifth point is how relatively little media coverage there is concerning this trillion dollar game and how much attention is focused on the shakeouts in the media which are relatively small games of $20-100 billion? Meanwhile, there are major developments about which we hear very little: How many are aware that the combined corporate and consumer debt in the US rose from 5 to over 12 trillion dollars in the 12 years from 1989 to 2001? [203]

Sixth, it is surprising to note that military contracts play a serious role in the survival of what is theoretically a public telecommunications company. In the 1960s, the hippies used to complain of the dangers of the military/industrial complex.[204] Most of us assume that these fears are as outdated as the hippies themselves. Yet there is serious evidence to the contrary. SAIC/Telcordia, have become major telco players while at the same time entering into $25 billion contracts with the military (Appendix 6).

13. Consultancy, Accounting and Banking

It was noted that American telcos such as AT&T are linked with carrier equipment companies, computer companies, content holders and home entertainment companies through a nexus of connections to achieve a uni-lingual, uni-cultural vision, which entails trillions of dollars. These are clearly enormous stakes. It is important to

1. Andersen (Accenture)	Enron, Qwest	Merrill Lynch[205]	16.2
2. Deloitte & Touche	Adelphia[206]		10.8
3. Ernst and Young	Cedant, Computer Associates Intl.		12.5
4. KPMG	Xerox		12.2
5. Price Waterhouse (now IBM)		Allied Irish Banks	17.5
Total			69.00

Figure 7. The Big Five Accountancy Firms in 2002, companies concerning which they are being investigated for malpractice and related banks.[207]

recognize, however, that there are two further dimensions which involve even larger stakes, namely, a) consultancy, accountancy, auditing, banking, insurance and b) energy. As will be shown, these entail a second vision, which threatens to jeopardize the first, is closely linked with the political events of the day, and is potentially a danger for the future of civilization.

Connections between the two visions are not immediately obvious. The first vision is about communications through the telcos, especially via the Internet and implications for education and e-learning. When telcos expand they need investment. When they engage in takeovers, mergers or bankruptcies they invariably require the advice of consultancy firms, which are typically also accountancy and auditing firms and they require the support of the bank and insurance companies.

In the past decades there has been a great consolidation in these consultancy firms such that one spoke of the big five (now the big 4): Andersen (Accenture); Deloitte & Touche; Ernst and Young; KPMG and Price Waterhouse Coopers (now IBM). As might be expected these have been closely involved with telcos, computers and the Internet. They have also been involved directly in irregularities concerning accounting. Andersen is linked with Qwest concerning discrepancies; Deloitte and Touche with Adelphia;[208] Ernst and Young with Computer Associates International and KPMG with Xerox. All of the big five are now being examined for irregularities and questionable practices.[209] Though conflict of interest within the Big 5 has in part stemmed from 'in house' temptations, recent revelations are less neutral than they might at first sight appear.

In 1999, the combined earnings of the big five amounted to some $69 billion (figure 7).[210] In 2003, these have become the big 4, (with consulting branches, cf. Accenture, Bearing Point, Deloitte Consulting and CapGeminiErnst and Young), with earnings of some $62 billion.[211] From a global viewpoint these are modest sums of money. Striking, however, is how the activities of the major consulting/ accountancy/auditing firms extend far beyond bookkeeping. We noted, for instance, that PriceWaterhouseCoopers was one of the competitors of SAIC in winning a $543 million military contract for e-learning. It is important to recognize also that the irregularities of the big five extend beyond telcos and media firms to other fields.

For instance, there are similar irregularities in the pharmaceutical field: a $1 billion error with Bristol Myers Squibb and a $12.4 billion error with Merck.[212] If this applies equally to other key investment areas such as biotechnology and nano-technology then the game is much bigger than it at first appears.[213] The telco crisis and problems with the Internet are part of something much larger. The 201 mergers in US insurance companies in the first nine months of 2001 is another indication of major change as is the trend for traditionally solid mutual companies such as John Hancock to convert to publicly held stock companies.[214]

Meanwhile, consulting companies such as Andersen in their new guise as Accenture are engaged in providing visions of e-government.[215] There have even been cases where consulting firms, which have audited government accounts, have claimed that these were no longer open to regular auditing checks, thus raising to a new level the age-old problem

of who inspects the inspectors. There is a growing sense that the law applies to everyday citizens but that high politics and high finance are above the law (cf. section 16).

Banks

These problems extend to and also implicate other financial institutions (e.g. insurance companies and banks) in the whole process. For instance, in the case of Enron, in addition to Andersen, at least eight US banks are directly implicated: 1) JP Morgan Chase; 2) Citigroup; 3) Merrill Lynch; 4) CSFB; 5) Lehman Brothers; 6) Bank of America; 7) Vinson & Elkins and 8) Kirkland & Ellis.[216] Serious evidence that Citigroup's Salomon Smith Barney and Grubman deliberately misled investors and profited therefrom has been discussed in the news.[217] Enron, is a particularly complex case. Companies such as Level 3, linked with Verizon (and Verisign) had close connections with Enron as did SAIC, via Entergy.

As with consulting firms there have been many mergers such as Citi Bank and Travelers.[218] To make matters worse there is a nexus of links between telcos (e.g. Qwest), carriers (Global Crossing), energy companies (Enron), accountancy firms (Andersen), investment firms (Carlyle Group).[219] One example is Gemplus, one of the leading companies on smart cards specifically with respect to mobile access to Internet. Gemplus, which has the Texas Pacific Group as chief investor, appointed Alex Mandl to a leading position but omitted to report that he had also been working for the CIA.[220] Mandl was also a director of Viasystems,[221] a "leading worldwide independent provider of electronics manufacturing services, or EMS, primarily in the telecommunications and networking industries."

Another example of the complexities involved is Cambridge Display Technologies (CDT), a British firm, which received investments from Esther Dyson and was subsequently bought up by Hillman Capital Corp. Gerald Paul Hillman, managing director of that company wrote about President Musharraf on September 11 2001.[222] He is also a member of the Defense Policy Board, which advises the secretary of defense of the United States.

Such links between high finance and military interests are evident elsewhere. For instance, Marsh Inc. Now claims to be the largest re- insurance company in the world.[223] In 2001, Paul Bremer left his position with Kissinger Associates to become the chief executive of the Crisis Consulting Practice of Marsh. He has since been appointed as the US "governor" of Iraq.[224] Some claim that this is mainly to assure the interests of companies such as Haliburton and groups such as Carlyle.[225]

Reports of irregularities throughout this system point to a crisis in consulting, bookkeeping, accountancy, auditing, investing, consulting, banking, insurance, indeed the entire financial infrastructure. The deeper crisis is ultimately one of integrity and trust.

14. Energy

The pipelines of communication in the telco and computer field are becoming inextricably linked with the pipelines of energy. The largest computers in the world (Sandia, Los Alamos, Lawrence Livermore), are supported by the Department of Energy (DOE). Oil, gas

and other energy sources are fueling the new frontiers of communications in more senses than one.[226] In this context nanotechnology is something much more than a general trend towards miniaturization. It is part of a conscious plan to control the future of production especially in the domain of energy.

Rather than accepting that the US depends on other countries for oil, there is a belief that it can simply "go in"[227] and arrange the destiny of other nations in the name of fighting terrorism. Indeed there is a growing sense that America believes that its laws apply globally and that others' laws leave America unaffected.[228] Those who agree with America are allies. Those who disagree are potentially enemies.

In the James Bond film the *World is Not Enough*, the plot involved a competing Russian and American oil pipeline. In the film, the US pipeline won the day. In real life, the Russian pipeline exists and the American one is unfinished. Meanwhile a gas pipeline from Turkmenistan through Afghanistan was planned by Bridas (now BP Amoco) and then found competition by Unocal from Texas.[229] In this context SAIC's increasing interest in BP may also be more than a co-incidence.[230] So one of the overt reasons for the war on terrorism is to permit oil and gas pipelines to work. A more covert reason is to gain control of the world's energy sources.

15. A Bigger Picture

The war in terrorism in Afghanistan entails other curious paradoxes. By ousting the Taliban (who were supported by the CIA[231]), the US has re-instated Afghanistan as the producer of 70% of the world's heroine production and as such has increased the sources for the funding of terrorism.[232] We are told about the need for free discourse. Ironically, the National Science Foundation (NSF) is now sponsoring a Virtual Agora Project via Carnegie Mellon University "to develop and test software that would enable large numbers of citizens to use the Internet more effectively to learn about, deliberate and act upon community issues."[233] The same NSF is involved in the kinds of technologies (cf. figure 5) that point to a future sketched in films such as *Minority Report*.

Meanwhile, the communications media are directing our attention elsewhere. They tell us of a new corporate fraud bill in Congress and of an office for global communication to enhance the US image. They tell us about accountancy problems in a few hundreds of millions (Enron, Qwest) or bankruptcies of $10-50 billion here and there. They say little of an ever expanding military budget in which, as we have seen, over 40 billion dollars of taxpayers money are being used to redesign the Internet to meet the needs of the secret services rather than the everyday user.

The so-called economic slump and potential crisis is not about media firms or telephone companies. It entails the key accountancy firms, the banks and it involves energy. The new great game is about media, investment and energy. Or as the insightful Shaykh Dr. Abdalqadir as-Sufi has noted:

> …Consider groupings of power barons divided into three camps: Commodities (of which the primary is oil), Finance, and Media. These are the imperialist forces and

> national governments have no greater importance than their role as focal command points. This can be clearly observed in the current tragedy where the issue is uniquely petrol, and the role of the media is to underline it as a military response to a terrorist outrage, while the end result is to hand over a country to the bankers in a world where Aid is itself a militant form of invasion.[234]

Yet, for all the importance of oil, finance and media, the true crisis lies elsewhere: not so much with material goods or companies, but with the problem of trust and integrity. This *crise de conscience* from the country of reality checks threatens to affect the future of the world. As George Soros noted recently:

> Foreign capital is fleeing the United States in the wake of as yet not fully realized scandals that will according to Fox News on July 6, take an estimated $600 billion out of the U.S. stock market this year. One of the many smoke alarms triggered by this is the fact that the US economy needs an estimated 1.5 trillion per year in new foreign investment to remain solvent.[235]

The media are still full of discussions about the symbolic event on 11 September, 2001.[236] There is little discussion about the possibility that the US government had prior knowledge[237] and that it possibly welcomed the event.[238] There were attempts to link this event with a number of anthrax[239] incidents (attacks) until it became clear that the source was a military lab (probably in the US) and that recipients such as Senator Tom Daschle[240] were at odds with the government in power.

A war on terrorists was launched. According to the rhetoric, the enemy entails terrorists, who are assumed to be foreign. But like the American cartoon figure, Pogo, there is a growing realization that: "We have come upon the enemy and we are they." The enemy is not outside but within. And like the war on drugs, there are attempts to fight with weapons and flag waving what are ultimately matters of the spirit and the soul.

The world still looks to the US and Europe as champions of democracy and of universal rights of the majority.[241] By its own actions the US is in danger of destroying its own credibility and others' faith in America. In the past, any intimation that a politician had lied typically forced them to resign. Today presidents and prime ministers are being accused of lying on multiple fronts and yet they do not consider resignation. At stake is much more than the future of the Internet, corporate shakeouts or even the future of free business. At stake is the future of democracy, freedom and the continuity of civilized life.[242] Ultimately there is something much more important than enormous sums of money, namely, the really important things that money cannot buy.

16. The Future of Law

These developments entail another fundamental dimension that requires closer attention. At least since the time of Moses, there has been a close link in Western culture between civilization and law. Plato's *Laws* was one of his most important books. Rome's empire evolved with an assumption that no individual was above the law. In the course of the centuries, Europe has seen the rise of alternative legal systems, notably the French

(Napoleonic) and the Anglo-Saxon (cf. Teutonic and Celt) codes. Even so the basic idea of law as supreme has remained paramount. These assumptions lie at the basis of national law, transnational law, international law and of the World Court in The Hague.

The re-emergence of a might is right[243] attitude, which recalls the semi-lawless days of the Wild West, is apparent in subtle forms in television programmes such as *Knight Rider* and *Airwolf* where individuals, claiming to work for the right, take the law into their own hands and sometimes blatantly destroy and kill without regard for local authorities and jurisdictions. A recent study at Harvard suggests that countries with the most money make the most progress and hence implies that might might be right.[244]

When such maverick actions become part of national policy as witnessed by events in Afghanistan and Iraq, the implicit assumption is that certain key individuals and indeed whole nations are or pretend to be above the law. This is an international phenomenon as is witnessed by recent actions of Silvio Berlusconi.[245] The US trend is, however, the more remarkable and worrying because it undermines much more than the habits of a single country. It tries captured soldiers on a base in Guantanamo Bay as enemy combatants to circumvent the Geneva Convention re: prisoners of war and to avoid constitutional rights which those individuals would have if tried on US soil. It puts pressure on Belgium to abandon its internationally binding laws for those who commit acts against humanity or refuses to be subject to the world court in The Hague. It goes further by blocking aid to the 35 countries, which have refused to guarantee US citizens abroad immunity from the international laws of the world court.[246] Implicitly the US claims to be above the law, which is also the title of a Hollywood film (1988), a book by David Burnham (1996),[247] a television series (2000)[248] and more recently a music CD. Explicit allegations of acting above the law have been leveled at the President,[249] the Vice-President,[250] the US Treasury,[251] bounty hunters[252] and extend to organizations such as Alcohol.edu.[253]

In this context, the economic crisis of the past few years is something much more profound than another dip in the ever fluctuating markets which led from a dot.boom to a dot.bust. The losses in financial terms are linked with a crisis in trust, honesty and integrity, whereby the primary institutions of capitalism are called into question: banks, insurance companies, consultancy firms and even the legal profession. If we call into question the basis of trust and law, then we call into doubt the future of civilization.[254]

17. Conclusions

As with all important developments, there are many myths and stories concerning the Internet. One myth states that the United States invented the Internet. Another story claims that telcos had almost nothing to do with the early history and development of the Internet. This essay has offered evidence to show that the story is considerably more complex on both counts: 1) that the Internet began in the United Kingdom, and involved other countries such as France from the outset; 2) that telcos have played a central role in the evolution of the Internet and continue to do so. It was shown that these links extend far beyond the realms of telephony and Internet. They entail plans to control the field of naming and extend to the realms of e-science, e-military and e-business as well as e-education and e-learning.

It was noted that what began as the Arpanet and became the Internet is now at a crossroads with three trends within the United States all heavily linked with the military, namely,

1) ARPA's move towards an Interspace (figure 3a);
2) NASA's move towards an Interplanetary Internet (figures 3b) and
3) the Pentagon's trend towards a Total Information Awareness (TIA, figure 5) system.

Although the Internet has grown from c. 200 million to over 650 million users (a majority outside the US) in the past three years, it is striking that decisions concerning these three directions are being made without consulting ordinary citizens in the USA itself let alone the rest of the world.

In the realm of telcos, four major players in the United States were discussed. It was shown that: 1) AT&T has been active in development of the Internet; 2) that MCI/Worldcom was equally active until its "bankruptcy" in June 2002; 3) the Baby Bells and especially Verizon continue to have links with AT&T and remain active in the Internet; 4) Bellcore (Bell Communications Laboratories) in its new guise as Telcordia under Science Applications International Corporation (SAIC) also plays a significant role in these developments. From this emerges a larger picture whereby AT&T, its Baby Bells and its former laboratories (BellCore, Lucent) remain closely related. The Chairman of Telcordia, Michael J. Desch, is also the chairman of Airspan Wireless.[255]

It was suggested that this mainly invisible connection between the parts helps to explain why AT&T's greatest rival, Worldcom, suddenly went "bankrupt"[256] and why Worldcom's prospective $3.5 billion contract went to the Baby Bells, while its customer base was taken over by Verizon (Bell Atlantic, a former Baby Bell in a new guise). This could also help to explain why competitors such as Adelphia, Winstar Communications, Williams Communications, Metromedia Networks, and XO, are now bankrupt, while others such as Sprint have faced bankruptcy. Some are tempted to link this emerging pattern with bankruptcies in fixed wireless.[257]

It was claimed that while the news media focus our attention on accountancy problems and the bankruptcy of the week, we are in danger of being distracted. Such events have their significance: they affect hundreds and sometimes thousands of jobs. But we are also in world of six billion persons. In a world where the global markets entail well more than one trillion dollars in transactions daily it is vital that we look to a much bigger picture.

On the surface, this bigger picture entails irregularities in investment via both the consulting/accountancy firms, banks and insurance companies, which are posing problems. It was shown that these irregularities extend far beyond the realm of individual media companies or telcos. They include all the major areas of investment including pharmaceuticals, nanotechnology[258] and energy. At a deeper level, the big picture is about other things.

At a material level, there is an attempt to control the markets as a means of gaining control of energy. At first sight this is about making war on countries such as Iraq, and controlling their oil. This boosts the military industry. In the process, one destroys much of the

architectural and other infrastructure, which thus boosts the building industry especially when one controls who gets the contracts. But this goes far beyond the interests of big industry or even what General Eisenhower once called the military industrial complex: where those who govern are also those to decide on trends; where military actions are intertwined with business and investment; where they decide on the future of whole countries without attention to the many innocent civilian lives that are killed in the process and where everyone who is worried by that picture is observed as if they were terrorists.

This small group acts as if their own rules were more important than the combined wisdom of three millennia of legal frameworks. Amidst a rhetoric of governance, they ignore all the rules of governments and legal bodies and bide only by their own decisions. Some would conclude that there is serious evidence that the highest levels of an elected government in tandem with the secret services and the military are working on agendas contrary to the public interests of those who elected them. Some would argue that this small group manifests itself in the White House, Congress, in large corporations, in the Internet Society and ICANN. Others would argue that the influence of this small group this has spread much more widely. Still others would argue that the small group influences an enormous number of not so small groups, large groups and even the fates of billions.

In any case, at a non-material level this is leading to a crisis in trust, and a potential crisis in concepts of democracy and freedom everywhere. At this level, the crisis is one of faith, in a secular[259] sense of basic honesty and integrity, which are a basis of law and ordered society. If we are not careful there may no longer be a world within which to build our open and sustainable structures. The big picture is ultimately about there being a future picture. That picture must offer equality of access to information and knowledge for all, guaranteeing their integrity and free circulation. There is a challenge for the older civilizations such as Europe and Asia to show the way to a more balanced future.

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Notes

[1] Lawrence Lessig, "Innovation, Regulation, and the Internet," *The American Prospect*, Issue Date: 0.0.00.

See: http://www.prospect.org/print/V11/10/lessig-l.html. John Naughton, *A Brief History of the Future: From Radio Days to Internet Years in a Lifetime*, New York: Overlook Press, 2001.

[2] Robert Cannon, "FCC and the Internet. Thirty Five Years of Unregulation," *INET 2002*, Arlington, June 2002.

[3] If one thinks in terms of the seven layers of the International Standards Organisation (OSI/ISO) then the telcos focussed on layers 1 and 2 with some activities in layers 3-4, whereas the Internet community focussed on higher levels (5-7).

[4] See: http://www.iptel.org/info/. Cf. Igor Faynberg and Hui-Lan Yu, "Internet Telephony," *INET 2002 Tutorial*, Arlington, VA, June 18 2002.

[5] Among the earliest pioneers of the Internet was a Frenchman, Louis Pouzin, who is:

> best known for his work as the inventor and advocate of "Datagrams", later extended and renamed connectionless communication, as the basic mode for the transmission of packets in a network. His ideas in this area paved the way for a new thread of thought on how to manage resources in networks, resulting in several major innovations, including today's ATM networks.

Pouzin introduced the Cyclades computer network project and was honoured with Jon Postel as a joint winner of the 1997 SIGCOMM Award. Cf. Pouzin, Louis,ed., *The Cyclades Computer Network: Towards Layered Network Architectures,* North Holland Publishing Company, New York, 1982. This book is Volume 2 of a monograph series of the international council for computer communications. For an Annotated Bibliography [re: Cyclades Network].

See:

http://www.cs.utexas.edu/users/chris/nph/CYCLADES/lam/Cyclades/Bibliography/CycladesBibliography.htm. Cf. Louis Pouzin. Le "père" du réseau Cyclades, *Autrans '98 Interviews,* Autrans, 10/01/98 :

"Louis Pouzin…a été Directeur des Projets Pilotes à l'INRIA, où il a conçu et dirigé le développement du réseau d'ordinateurs CYCLADES, comprenant le premier réseau de commutation de datagrammes."

See: http://www.inria.fr/actualites/colloques/1999/COLLOQUIUM990119-fra.html.

See: http://www.acm.org/sigcomm/award-detail/postel-pouzin-detail.html

For Pouzin's recent work

See: http://www.isocfrance.org/edito/index.php?ID=865

[6] See: http://www.thocp.net/biographies/davies_donald.htm. The Internet: Jesper Vissing Laursen, Past, Present and Future - Internet & WWW History.

See: http://www.vissing.dk/inthist.html#10.

7 Peter T. Kirstein, "Early Experiences with the ARPANET and INTERNET in the UK."

See: http://www.cs.ucl.ac.uk/staff/jon/arpa/internet-history.html.

Cf. http://www.cs.ucl.ac.uk/staff/P.Kirstein/.

[8] Peter Kirstein, personal communication.

[9] Bruce Sterling, "Short History of the Internet," *The Magazine of Fantasy and Science Fiction*, February 1993, Cornwall, CT, Science Column #5: "Internet."
See: http://www.forthnet.gr/forthnet/isoc/short.history.of.internet

[10] Dominic Pinto has kindly noted: "it was the (wartime related ?) impetus in Bell Labs as much as anything else which drove development of semi-conductors, by way of transistors, and all the people involved in Colossus..... A lot out of PO labs at Dollis Hill, and Tommy Flowers..Martlesham Labs inherited that legacy…. There's still a sense of not invented here syndrome, and stuff has to be redone (as it was in the past) to meet BT (formerly BPO) requirements. Prestel may have been a world first, and an antecedent for graphic interfaces, if not hypertext, and there was considerable development of optical switching and optical components, following on from the fiber optic research, exploited in conjunction with duPont - but not on any sufficient scale."

[11] See: http://ftp.arl.mil/~mike/comphist/eniac-story.html

[12] Vannevar Bush would seem to be related to the current president of the US.

[13] See: http://kerryr.net/pioneers/shannon.htm

[14] Cf. Norbert Wiener, *The Human use of Human Beings*, 1950. Reprint London: Eyre and Spottiswoode, 1954. Reprint, New York: Da Capo, 1988 etc.

[15] See: http://www.digitalcentury.com/encyclo/update/shannon.html

[16] Claude Shannon's "A mathematical theory of communication" was first published in two parts in the July and October 1948 editions of the *Bell System Technical Journal*.
See: http://cm.bell-labs.com/cm/ms/what/shannonday/paper.html.

[17] John S. Quarterman, "Revisionist Internet History," *Matrix News*, 9(4), April 1999,
See: http://www.mids.org/mn/904/large.html

[18] See: http://www.ietf.org/rfc/rfc0681.txt?number=681

[19] See: http://www.mids.org/mn/904/large.html

[20] See: http://www.lesk.com/mlesk/. In the 1990s he worked on a large chemical information system, the CORE project, with Cornell, OCLC, ACS and CAS.

[21] See: http://www.upenn.edu/heia/people/bio/lesk.html

[22] See: http://www.cise.nsf.gov/iis

[23] See: http://www.canis.uiuc.edu/schatz.html

[24] See: http://www.canis.uiuc.edu/projects/interspace/proposal/Previous%20Accomplishments.html

[25] See: http://athos.rutgers.edu/~cwm/NetStuff/Human-Nets/Volume8.html

[26] See: http://www.canis.uiuc.edu/projects/telesophy/letter_from_William_Arms.html

[27] See: http://www.asis.org/asis-95/Schatz-Keynote/

[28] See: http://www.att.com/history/history5.html. The site http://www.att.com/corporate/restructure/history.html is no longer available.

[29] In 1993, AT&T also acquired McCaw Cellular for $11.5 billion, to place it "squarely in the fast-growing cellular services market."
See: http://www.att.com/history/history4.html .

[30] See: http://www.research.att.com/info/Lab/15

[31] See: http://www.research.att.com/info/Lab/21

[32] See: http://www.research.att.com/info/Lab/33
Lucent's 8 key internet products are:
1. Bell Labs ICAP Client Library

2. Bell Labs Internet Service Engine (ISE)
3. Safe file transport tools for the Internet (Cget, Cput, and Stage)
4. Lucent Personalized Web Assistant
5. NSBD (Not-So-Bad Distribution)
6. RMTP (Reliable Multicast Transport Protocol)
7. Tardis
8. VENUS (Virtual-circuit Enhanced Network Usage Simulator)

See: http://www.bell-labs.com/project/

[34] Clay Shirky's Writings About the Internet, Economics and Culture, Media and Community, Open Source: ATT and Cable Internet Access, 11/4/1999.

See: http://www.shirky.com/writings/att_cable.html

[35] See: http://www.havi.org/

[36] See: http://www.upnp.com/UPnPdemos/image.htm

[37] See: http://vehand.engr.ucf.edu/handbook/Chapters/Chapter63.htm

[38] See: http://roland.lerc.nasa.gov/~dglover/sat/telstar.html;
http://www.ieee.org/organizations/history_center/milestones_photos/rocket.html
http://www.larrysworld.com/articles/historypc.htm

[39] See: http://www.lucent.com/press/1199/991116.cob.html\

[40] Yukari Iwatani, Reed Stevenson, "Une alliance avec AT&T renforce la stratégie mobile de Microsoft," *Boursama*, le 01, 08, 2002.

See: http://www.boursorama.com/international/detail_societes_intern.phtml?news=897795

See: http://www.wapsight.com/info/2002/08/01/113528.html

[41] See: http://www.att.com/news/0791/910730.pda.html

[42] See: http://www-1.ibm.com/services/globalnetwork/

[43] See: http://www.ecommercetimes.com/perl/story/1377.html

[44] See: http://www.nwfusion.com/news/2000/0225attibm.html

[45] See: http://www.ecommercetimes.com/perl/story/4208.html

[46] See: http://www.aspstreet.com/pr/a.taf/idpr,16170

[47] See http://www.siliconvalley.com/mld/siliconvalley/2997058.htm

[48] See: http://news.com.com/2100-1023-947139.html.

[49] Dean Takahashi, "The Accelerator," *Red Herring*, July 2002, pp. 37-40.

[50] See: http://www-1.ibm.com/servers/eserver/pseries/solutions/success/earthgrain.pdf

[51] The full story of AT&T is much more complex than this introductory sketch. It would include how AT&T took over John Malone's TCI in 1999 or $54 billion, then disbanded it in 2001 after which it became Liberty Media with the second largest number of shares in Murdoch's Newscorp (18%), 4% in AOL and its hands in numerous German media companies.

See: http://www.ketupa.net/liberty.htm.

[52] Some see more difficulties with AT&T. Cf. Robert Metcalfe, The Unauthorized Biography of the Baby Bells & Info-Scandal, New Networks Institute, 1999.

See: http://www.newnetworks.com/toc.html.

[53] Some observers feel that this extends to positioning towards an Ipv6 environment and IP everywhere – even though the U.S. appears playing a low profile game on this at present, watching the Chinese watching the Japanese watching the European Union search for sustainable development projects on the back of IPv6 as a priority.

[54] See: http://www1.worldcom.com/uunet/about/
[55] See: http://www1.worldcom.com/global/about/corporate_information/data_firsts/
[56] See: http://www.fcc.gov/telecom.html.
Cf. http://www.cmcnyls.edu/USLaws/1996-Act.HTM
[57] See: http://www.cmcnyls.edu/bulletins/NYNEATTA.HTM
Meanwhile, NYNEX Cablecomms merged Along with Bell Cablemedia, Mercury Communications and Videotron to form Cable & Wireless Communications whose parent company of Cable and Wireless owns 460,000 km of undersea fibre optic cable around the world, making them the world's second largest owner of cable capacity.
See: http://www1.cw.com/template_11.jsp_?ID=gn_index.
Cable and Wireless is also one of the leading telcos in the world:

> John Pender was an ambitious entrepreneur whose enterprise and foresight led to the creation of the world's largest telecommunications network. In 1852, he invested in the Anglo-Irish Magnetic Telegraph Company, the first step in a life-long involvement with international telecommunications. In 1856, Pender became a director of the Atlantic Telegraph Company, and between 1864 and 1872 founded or co-founded four major companies: the Telegraph Construction and Maintenance Company, the Anglo-American Telegraph Company, the British Indian Submarine Telegraph Company, and the Eastern Telegraph Company, of which he was chairman until his death in 1896.

See: http://www1.cw.com/template_05.jsp_?ID=us_01_02
[58] This merger also entailed Nevada Bell, Cellular One, Tele-TV and Americast.
[59] US West merged its Media One Express with Time Warner's Road Runner. There was also a US West Media Group and a US West New Vector Group.
[60] See: http://www.verizonwireless.com/jsp/aboutus/index.jsp
[61] See: http://www22.verizon.com/about/international/
[62] Jeff Clabaugh, **"**Qwest's accounting qualms trigger stock shock," Washington Business Journal, June 26, 2002.
See: http://washington.bizjournals.com/washington/stories/2002/06/24/daily32.html.
Cf. http://eatthestate.org/06-15/QwestImmunexYour.htm
For the connections with Andersen's accounting
See: http://www.larrysworld.com/articles/historypc.htm
[63] See: http://www.ameritech.com
[64] The former http://www.bel-atl.com/hometext.htm is no longer extant and is now under http://www22.verizon.com/
[65] See: http://www.bellsouth.com
[66] The former http://www.nynex.com is now under http://www22.verizon.com/
[67] See: http://www.sbc.com formerly http://www.swbell.com/
[68] Ibid. (+Ameritech+ Pacific Telesis).
[69] This merger also included Continental Television.
Cf. http://www.uswest.com/
[70] See: www.comm.vt.edu/faculty/sung/ 03-07-00%20Infrastructure.ppt. In 2003 Qwest received a long-term $1 billion dollar loan from Merrill Lynch, Credit Suisse First Boston and Deutsche Bank.
Cf. http://www.redherring.com/insider/2003/01/babybells010703.html

[71] Level 3's shares rose quickly in June 2001 when the company signed "an agreement with Microsoft to provide broadband access for the software maker's MSN Internet services."Melanie Austria Farmer, "Microsoft deal boosts Level 3 shares," *CNET News.com*, June 26, 2001 2:55 PM.
See: http://news.com.com/2104-1033-269022.html.
There are also links between MSN and Verizon. These links with Microsoft are developing. On 22 July 2002 it was announced that Level 3 would help power Xbox Live. David Becker "Level 3 to help power Xbox Live,"CNET News.com July 22, 2002, 12:05 PM PT, See: http://news.com.com/2100-1040-945493.html.
In the past months Level 3 has also been buying companies such as (i)Structure, Corporate Software and Software Spectrum Inc. Jim Wagner, "Another Software Company for Level 3," ISP, May 2, 2002.
See: http://www.internetnews.com/isp-news/article.php/8_1028301
In January 2002 when Williams Communcations was still a thriving company, Level 3 tried to buy it. In April, Williams was bankrupt. In July 2002, Level 3 is again trying to buy Williams.
See: http://www.theregister.co.uk/content/7/26362.html
[72] See: http://www.forbes.com/2002/01/28/0128longhauls.html
There are also links between Enron and Jeb Bush
See: http://www.counterpunch.org/claybrookjeb.html
There are links between the Bush Family and Iran Contras
See: http://www.almartinraw.com/
Cf. http://www.geocities.com/ravencrazy/Negroponte.html
There are also links between the Bush administration and Enron:
See: http://www.thenation.com/thebeat/index.mhtml?bid=1&pid=8
[73] See: http://www.broadbandreports.com/shownews/19522
Cf. http://moneycentral.msn.com/content/P26293.asp
[74] See: http://www.globalcrossing.com/xml/global/gl_company.xml
[75] "Verizon, Level 3 Reported Among Global Crossing Bidders," XCHANGE News, Posted on: 05/09/2002.
See: http://www.xchangemag.com/hotnews/25h9153620.html
[76] See: http://www.businessweekly.co.uk/news/view_article.asp?article_id=7644
[77] *Walter Pincus and Christopher Lee, Dense Adviser Perle resigns,* Washington Post Staff Writers
Thursday, March 27, 2003; 6:45 PM. http://www.washingtonpost.com/wp-dyn/articles/A38829-2003Mar27.html. Mr Perle was also found to have made deals for post war Iraq via a British intelligence contracting company.
[78] See: http://telephonyonline.com/microsites/Magazinearticle.asp?Magazinearticleid=154344&srid=11159&instanceid=20947&pageid=4788&magazineid=7&siteid=3
[79] See: http://www.business2.com/articles/mag/0,1640,46925,00.html
[80] See: http://www.washingtontechnology.com/news/17_2/federal/18106-1.html
Cf. Patience Wait, "WorldCom bankruptcy filing freezes DREN," Washington Technology, By 07/22/02,
See: http://www.washingtontechnology.com/news/1_1/daily_news/18616-1.html

[81] Jeb Bush, the Governor of Florida, is also linked with Katherine Harris who played a role in counting the votes concerning the election of his brother, George, with repect to the presidency of the United States.
See: http://www.failureisimpossible.com/needtoknow/scandals.htm

[82] See: http://www.savannahmorningnews.com/exchange/stories/041302/INVsavannah30review.shtml

[83][76]Shane Harris, "WorldCom loses multi-billion dollar FAA contract," Govexec.com, July 16, 2002.
See: http://www.govexec.com/dailyfed/0702/071602h1.htm

[84] One reason for this, it is said, was to ensure that the DREN contract remained part of their assets.

[85] Worldcom bought its wireless services from "the top four U.S. providers: Verizon Wireless, Cingular Wireless, Redmond's AT&T Wireless Services Inc. and Sprint PCS Group."

[86] See: http://seattlepi.nwsource.com/business/80096_verizon26.shtml

[87] See: http://www.theleadingedge.org/2001/sarin.htm

[88] See: http://www.infospaceinc.com/corpinfo/investor/00q1pr.jsp

[89] See: http://corp.respond.com/pressreleases/20020506a.html. There are many more such connections. NCCW is the leading provider of business-class Web hosting to small and medium businesses. Through companies such as NCCW, Level 3 is further connected to connected Alliance partners such as Cisco, Compaq, Microsoft, Hewlett-Packard, Verizon, and VeriSign and backbone partners including Sprint, Cable & Wireless, WorldCom, McLeodUSA, Level 3, AT&T, and XO.

90 "Sarin to succeed Gent at Vodafone," *PMN*, 19 December 2002.
See http://www.pmn.co.uk/20021219gent.shtml

[91] See: http://www.sbc.com/press_room/1,5932,31,00.html?query=20134

[92] See: http://www.redherring.com/industries/2000/0224/ind-accel022400.html

[93] Cf. Emily Nelson et al., "US Cable Giant Renews its European Offensive," *Wall Street Journal Europe*, vol. XX, no. 127, August 2-4 2002, p. 1. Re: Malone's Liberty Media. Cf.
See: http://www.businessweek.com/bwdaily/dnflash/may2002/nf2002056_2231.htm;
See: http://asia.businessweek.com/bwdaily/dnflash/jun2001/nf2001064_331.htm

[94] Questions are being raised whether some of the sudden stock market drops and subsequent buying at bargain prices have not been orchestrated.
See: http://www.boursorama.com/international/detail_actu_intern.phtml_?news=901144

[95] See: http://www.norlight.net/newsroom/701.pdf

[96] Pulver Com's Telecom Antitrust Intelligence Report. Broken Trust 1: BELL CEO's FOLLOWING THE SIREN CALL OF MONOPOLIZATION DRIVE THEIR COMPANIES ONTO THE ROCKS.
See: http://www.pulver.com/antitrustreport/sample.html

[97] See: http://www.saic.com/about/timeline/1970.html

[98] See: http://www.saic.com/about/timeline/1983.html

[99] See: http://www.saic.com/about/timeline/1987.html

[100] See: http://www.saic.com/about/timeline/1997.html

[101] See: http://www.verisign-grs.com/aboutus/ which now contains only the second part of this quote which was previously available http://www.verisign-grs.com/aboutus/history.html
[102] See: http://www.iana.org/
[103] See: http://www.saic.com/about/timeline/1997.html
[104] See: http://www.webmethods.com/partners/partnerDetail/1,2121,366,00.html
[105] See: http://www.verisign.com/corporate/news/2001/pr_20010410b.html
[106] In 2000, SAIC acquired:

a) Broadway & Seymour, Inc.'s financial services customer relationship management business to improve "processes and manage information;"

b) Boeing Information Services, to deal with systems integration in the aerospace and military IT business

c) assets and operations of the Automotive Network eXchange® (ANX®), …"to provide a secure, reliable, multi-provider virtual private network service for business-to-business internetworking." SAIC also initiated a joint venture with Rolls-Royce, called Data Systems & Solutions, "to provide integrated control and knowledge management systems to energy, aerospace, and marine companies using gas turbines."

See: http://www.saic.com/about/timeline/2000.html

[107] Krista Wald, Peter Dobbin, "Toshiba and Bellcore Team Up to Create the Future of Wireless Internet Communications," February 17, 1999, New York, NY.

See: http://www.telcordia.com/newsroom/pressreleases/990217toshiba.html**.**

By co-incidence Toshiba, Sony and IBM also have an arrangement to produce Play Station 3 together.

[108] See: http://www.saic.com/about/timeline/1999.html
[109] See: http://www.saic.com/about/timeline/2002.html
[110] See: http://www.telcordia.com/aboutus/background.html
[111] See: http://www.telcordia.com/aboutus/vision/index.html
[112] See: http://www.telcordia.com/aboutus/timeline/company.html
[113] See: http://www.ietf.org/html.charters/enum-charter.html. Concerning the privacy issues raised by ENUM see: http://www.efa.org.au/ re: submission

See: http://www.efa.org.au/Publish/efasubm-enum.html to the ACA

See: http://www.aca.gov.au/ expressing concerns that the ENUM protocol

See*:* http://www.aca.gov.au/telcomm/telephone_numbering/enum_nsg2/huston.ppt - 703.0KB

Cf. < http://www.aca.gov.au/committee/nsg2/discussion.htm> no longer available which claims that ENUM does not seem capable of delivering adequate privacy protection for telephone and Internet users. Cf. EFA's ENUM page

See: http://www.efa.org.au/Issues/Privacy/enum.html

and other submissions

See: http://www.aca.gov.au/committee/ in response to the ACA discussion paper, 7th October 2002 Alert report.

[114] The site http://www.enumworld.com/ is no longer extant.
[115] See: http://www.itu.int/osg/spu/enum/
[116] It is instructive to note that the ENUM experiments in the UK entail among others, Telcordia, Vodaphone, BT, ICB, MCI, Nominet (of which Verisign is a member), Neustar and Afilias "the first new registry operator selected by ICANN in November of 2000 to

launch a new registry system using a thick registry model based on the new EPP (extensible provisioning protocol) standard."

See: http://www.ripe.net/ripe/meetings/ripe-46/presentations/ripe46-enum-bof-uk.pdf and

See: http://home.businesswire.com/portal/site/google/index.jsp?ndmViewId=news_view&newsId=20040127005417&newsLang=en

Neustar and Afilias are under Domain Bank. Re: Nominet and Verisign:

See: http://www.nic.uk/Members/ListOfMembers/

See: http://www.marketwire.com/mw/release_html_b1?release_id=61810

[117] See: http://www.icann-ncc.org/pipermail/discuss/2003-March/006646.html

[118] See: http://www.nic.uk/Members/ListOfMembers/

Cf. http://www.verisign.com/corporate/news/2001/pr_20010924.html

[119] See: http://www.bizjournals.com/tampabay/stories/2003/07/28/daily2.html

[120] See: http://www.iito.org/us/english/standard/index.htm

[121] "In anticipation of the stepping out of the US government from domain name policy, the Council of Registers (CORE) was formed to register domain names. The Policy Oversight Committee (POC) is an eleven-member committee formed by representatives from CORE, IAB, IANA, WIPO, INTA, ISOC and ITU. The POC defines policy and oversees its policy in implementation. These policies are developed in cooperation with the IANA." In: Democratic Structures in Cyberspace, 6.805-10.

See: http://www.swiss.ai.mit.edu/6095/student-papers/fall98-papers/democracy/whitepaper.html

[122] Written Statement of Ira C. Magaziner. Subcommittee On Basic Research, March 31, 1998. See: http://www.house.gov/science/magaziner_03-31.htm

Elizabeth Wasserman,"The Internet After Ira Magaziner", *The Industry Standard*, Nov 16 1998,

See: http://www.thestandard.com/article/display/0,1151,2494,00.html.

Cf. http://www.ntia.doc.gov/ntiahome/domainname/130dftmail/APIA.htm

[123]"Doing a "whois" search by name would raise considerable privacy issues. That's why the POC/CORE idea of aggregating it with all, other TLD data in one central database is so frightening. Not to mention that the revenue value of being able to e-spam or telephone solicit that community is enormous."

Cook Report on the Internet, "EMPHASIS ON ZERO SUM WIN/LOSE POLITICS PUSHES INTERNET MANAGEMENT DEBATE TOWARDS GRIDLOCK," April 1998 (7.01), pp. 1 – 8.

See: http://www.cookreport.com/07.01.shtml

[124] See: http://www.cnri.reston.va.us/HouseQ.html

[125] See: http://www.cnri.reston.va.us/testimony.html

[126] See: http://www.koreapost.com/2001_07/security_01.htm

[127] From: International DOI Foundation
Sent: Monday, July 29, 2002 16:12 PM
To: news@doi.org
Subject: Corbis and Content Directions partner to implement DOIs for images

[128] See: http://www.contentdirections.com/

[129] David Sidman, "Digital Object Identifiers: Not Just for Publishers," *CMS Watch*, 2002-03-31.
See: http://www.cmswatch.com/Features/TopicWatch/FeaturedTopic/_?feature_id=66
[130] See: http://www.ircam.fr
[131] See: http://www.bic.org.uk/BSIPaskin.ppt
[132] See the author's "Standard and Variant Names and Classifications: Cross-Cultural Challenges for Europe in a Global Context," *European Association of Directory and Database Publishers* (*EADP) Conference*, Rey Juan Carlos Hotel, 19 September, 2002, Barcelona 2002 (in press).
[133] See: http://www.educause.edu/nlii/
[134] See: http://imsproject.org/
[135] See: http://www.imsproject.org/metadata/mdinfo01.html
[136] See: http://www.atimp.army.mil/dtd/LOM_spec.htm
[137] Saba is also a leader in Human Capital Development and Management Solutions.
See: http://www.saba.com/english/index.asp
[138] This was available at http://www.learningcircuits.org/2001/jan2001/newsbytes.html but is now in the archives of www.learningcircuits.org.
[139] As in note 50 above:
PwC's was the lowest bid of the lot, according to sources. The contract is somewhat less than the original $600 million earmarked by the Army for its Army University Access Online program, which was announced in July. Analysts familiar with the deal report that the Army elected to phase in only the degree program components of its original plan; still unclear is whether or when other components including IT training will be awarded.
[140] See: www.atimp.army.mil/download/020220_SCORM_DL%20Policy%20Cmte.ppt
[141] See: http://twilight.dse.disco.unimib.it/cetus-mirror/cetus/oo_business_objects.html
[142] See: http://www1.worldcom.com/global/about/corporate_information/data_firsts/
[143] See:http://www.internet2.edu/ucaid/html/councils.html
[144] See: http://www.i- c0sx nternet2.edu (Homepage).
Cf. http://www.nren.nasa.gov/ngiarc.html;
Cf. http://www.nren.nasa.gov/ngiarc.html;
Cf http://nt1.alp.dillingen.de/telumm/schilfglossar/glossar/i/internet2.htm;
B-WiN; G-WiN, Abilene, vBNS
[145] See: http://www.saic.com/telecom/
[146] By Tim McDonald, "EU To Block WorldCom/Sprint Merger," *E-Commerce Times*, June 21, 2000. See: http://www.ecommercetimes.com/perl/printer/3611/
[147] See: l3www.cern.ch/~newman/doecitreview600/doecitreview_lhcnet600_long.ppt
[148] See: http://www.ngi.gov/
[149] See: http://www.dante.net/geant/about-geant.html
[150] http://www.eurogrid.org/
[151] See: http://www.ipnsig.org/reports/tutorial/sld003.htm
[152] Ian Foster, Carl Kesselman, eds., *The Grid: Blueprint for a New Computing Infrastructure*, San Francisco: Morgan Kaufmann Publishers, 1999.
[153] See: http://www.saic.com/cover-archive/saicpubs/ngn.html
[154] See: http://www.ieeaf.org. One of the key persons in this organization is Don Riley
See: http://www.ieeaf.org/board_of_directors/index.html,

Cf. http://www.ieeaf.org/vision/index.html) who is also a proponent of the next generation networks being developed by SAIC.

See: http://www.saic.com/news/jul00/news07-26a-00.htmltion

[155] See: http://eml.ou.nl/

[156] See: http://www.developmentgateway.org/

[157] See: http://itri.loyola.edu/hci/ac_nhil.htm

[158] Dr. David K. Kahaner, US Office of Naval Research Asia, reported on the development in 1994.

See: http://www.interesting-people.org/archives/interesting-people/199407/msg00046.html. It used to be available also at: http://www.cms.dmu.ac.uk/~cph/VR/nvr94.summary.txt

Cf. http://www.kom.e-technik.tu-darmstadt.de/acmmm99/ep/greenhalgh/

[159] See: http://www.chfforum.org under scenarios for 2025.

[160] According to Bruce Schatz we are moving from Arpanet and Internet towards Interspace.

See: http://www.canis.uiuc.edu/projects/interspace/index.html

[161] IBM also has a software called Interspace.

See: http://www-3.ibm.com/software/ad/visgen/about/vagen_faq.htm

[162] See: http://www.asis.org/asis-95/Schatz-Keynote/

[163] See: http://www.att.net/. There is also a WorldNet Daily

See: http://www.worldnetdaily.com/and a WorldNet Television.

See: http://www.ibb.gov/worldnet/

[164] See: http://www.darpa.mil/iao/TIASystems.htm. The first diagram has now been replaced by the second on this site.

The Electronic Privacy Information Centre (EPIC) has a series of references to developments.

See: http://www.epic.org/privacy/profiling/tia/

[165] See: http://www.canis.uiuc.edu/projects/medspace/index.html

[166[] See: http://www.pnl.gov/infoviz/technologies.html]

See: http://www.pnl.gov/infoviz/spire/spire.html

See: http://www.cs.sandia.gov/VIS/science.html

[167] See: http://www.cs.sandia.gov/VIS/science.html

[168] Robyn Weisman, "Can Cyber-Intelligence prevent Real-World Terrorism?," *NewsFactor Network*, September 19, 2001.

See: http://www.newsfactor.com/perl/story/13618.html

[169] See: http://www.syntek.org/

[170] See: http://www.amc.csc.com/mac/mac_lets_do_business.htm

[171] Syntek is also working with DARPA to create Peer to Peer applications which can be extended to create virtual supercomputers and also fit into the vision of a data grid.

Susan Breidenbach, "Feature: Peer to Peer Potential," *Network World*, 07/30/01,

See: http://www.nwfusion.com/research/2001/0730feat.html.

Syntek has been involved with frigates for the Canadian and the Chilean navy, and has taken over the construction of one of the largest oil rigs for South America.

See: http://www.tomifobia.com/oilrig.html

On 9 May 2002 Syntek was bought by British Maritime Technology Limited (BMT),which is also very active in software for the oil industry. New York dance club Madisons and

Syntek Technology Inc. in Arlington have joined not-for-profit organizations like the Guggenheim Museum and The Associated Press in using .org addresses.

Cf.: http://www.bmt.org/Headlines.asp

There is alos a Syntek Capital which deals with Media, Telecoms and IT Software.

[172] See: http://www.guardian.co.uk/Columnists/Column/0,5673,651975,00.html

[173] See: http://www.hereinreality.com/bigbrother.html. Meanwhile Oliver North is writing columns to support the idea of war in Iraq.

See: http://www.creators.com/opinion_show.cfm?columnsName=ono

[174] See: http://www.truthout.org/docs_01/02.20B.Bush.Conspirator.htm. It is striking that another of the figures implicated in the Iran story is John Negroponte, (brother of MIT Professor Nicholas Negroponte) who now is US Ambassador to the UN and active in Iraq "aid":

See: http://usinfo.state.gov/topical/global/refugees/archive/03031906.htm

[175] See: http://www.darpa.mil/iao/BAA02-08.pdf. For criticism cf: "Military intelligence system draws controversy", *CNN.com*, Thursday, November 21, 2002 Posted: 8:26 AM HKT (0026 GMT).

See: http://asia.cnn.com/2002/US/11/20/terror.tracking/. This has since been complemented by a new plan for a LifeLog system.

See: http://www.wired.com/news/print/0,1294,58909,00.html. For recent criticism see: Declan McCullagh, "Senator presses Pentagon on spy plan," CNET News.com, June 24, 2003, 5:07 PM PT. See: http://news.com.com/2100-1029_3-1020674.html?tag=fd_top. Cf. also the Talon initiative Brian McWilliams, "DoD Logging Unverified Tips," Wired News, 25 June 2003, at: http://www.wired.com/news/politics/0,1283,59365,00.html. For other recent developements which include lie detecting dogs see: "Anti Terror agency Turns Heads, Wired News, 24 June 2003, at: http://www.wired.com/news/politics/0,1283,59241,00.html. The most recent development in this context is an Urban Surveillance System. Michael J Sniffen, "U.S. Develops Urban Surveillance System", *Associated Press*, Tuesday, July 1, 2003; 9:35 PM .

See: http://www.washingtonpost.com/wp-dyn/articles/A60564-2003Jul1.html

Cf. http://www.darpa.mil/baa/sn03-13.htm

One of the reactions to TIA has been the Government Information Awareness Project.

See: http://opengov.media.mit.edu/GIA/links.html which also draws attention to related work such as: Open Secrets
Project Vote Smart
The Center for Public Integrity
Columbia Journalism Review
NameBase

[176] See: http://www.darpa.mil/iao/BAA02-08Q&Afirst.pdf

[177] Eliot Borin, "Feds Open 'Total' Tech Spy System," *Wired News*, 7 August 2002.

See: http://www.wired.com/news/conflict/0,2100,54342,00.html

[178] This logo has since been abandoned.

See: http://www.thememoryhole.org/policestate/iao-logo.htm

[179] See: http://www.darpa.mil/iao/TIASystems.htm.

His deputy is Dr Robert Popp.

See: http://www.marketaccess.org/bio_popp.asp.

[180] "Civil liberties groups including the Electronic Frontier Foundation find the prospect of such a system very worrisome without strict rules to prevent it from becoming a powerful secret spy machine." Cf. *Wired News*, 7 August 2002.
See: http://www.wired.com/news/conflict/0,2100,54342,00.html
[181] See: http://www.darpa.mil/iao/TIDES.htm
[182] See: http://www.eff.org/effector/HTML/effect16.04.html
[183] Dan Rosenbaum, "TIA Funding Snuffed, But…," *Over the edge*, 24 January 2003.
See: http://www.danrosenbaum.com/ote/2003/01/24.html
Even so the trend continues. Cf. Bruce Schneier, "Total Surveillance becoming Reality," *Special to ZDNet*, January 30, 2004, 5:01 AM PT.
See: http://zdnet.com.com/2100-1107_2-5150608.html
Cf. that author's recent book: "*Beyond Fear: Thinking Sensibly About Security in an Uncertain World,"* New York: Copernicus Books, 2003.
[184] See: (2003-01-27 07:31:58.0 category: XML-SemanticWeb) # Comments [0] TrackBackURL for this post:
See: http://www.freeroller.net/trackback/shareme?anchor=tia_killed_by_seante_but
Cf. http://www.freeroller.net/page/shareme?catname=XML-SemanticWeb
[185] See: http://defensetech.blogspot.com/2003_01_26_defensetech_archive.html
[186] *EFFector*, Vol. 16, No. 4; February 7, 2003, as in note above.
[187] See: http://www.pineappletown.blogspot.com/2003_02_02_pineappletown_archive.html
[188] See: http://www.leanleft.com/archives/000996.html
[189] Association of Former Intelligence Officers (AIFO), Weekly Intelligence Notes #17-03, 3 May 2003. section III.
See: http://www.afio.com/sections/wins/2003-17.html#darpa
[190] See: http://stacks.msnbc.com/news/940582.asp?0sl=-21
[191] See: http://www.triptronix.net/ishbadiddle/
[192] See: http://www.unionwriters.org/news/hearsay/issues.htm
[193] See: http://www.glreach.com/globstats/. Recently there have been times when it appeared that those leading the discussions concerning the Internet were speaking of the Internet as it was back in 1969 or during the 1970s or 1980s and to an extent this is no surprise. Stephen Crocker, who helped write the original Arpanet code is now ICANN's security chairman.
See: http://www.computerworld.com/securitytopics/security/story/0,10801,68514,00.html). Important pioneers such as Robert Kahn, and Vint Cerf, who were there on day one, are still very much in the center of action.
[194] *Visionary Manufacturing Challenges for 2020*, ed. Committee on Visionary Manufacturing Challenges, Board on Manufacturing and Engineering Design; Commission on Engineering and Technical Systems; National Research Council Washington: National Academy Press, 1998.
See: http://bob.nap.edu/readingroom/books/visionary/ch2.html#gc3
[195] It is disturbing to realize that when the Internet Society had a chance to become formally linked with certain international non-governmental organizations, or with the ICANN at Large membership, the idea was rejected because the numbers of ISOC's standards based and at the same time often US based membership could have been overshadowed by those in other countries, and its role "potentially distorted".

In Salt Lake City in December 2001, the Internet Society's Board of Trustees "revamped" itself from a democratically elected Board of 15 individual members, to a constituency cooptation with no direct representation from membership, and de-chartered the Internet Societal Task Force it had established early 1999. Some fear this may lead to marginalisation of independent non-standard voices in the formulation of ISOC policies, andsee a link between Verisign's .org divestiture, and ISOC's candidacy to run the .org registry which recently received provisional official support.

See: http://www.icann.org/tlds/org/preliminary-evaluation-report-19aug02.htm

[196] For an interesting analysis on the complexities of this development cf. Alvaro de Miranda and Morten Kristiansen, Technological Determinism and Ideology: The European Union and the Information Society, Public Agendas for Sustainable Technological Innovation. 3rd POSTI Conference, London, 1-3 December 2000.

See: http://www.esst.uio.no/posti/workshops/miranda.pdf. I am grateful to Suzanne keene for this reference.

[197] See: http://www.dnso.org/clubpublic/ga/Arc10/msg00299.html;

See: http://www.dnso.org/clubpublic/ga/Arc10/msg00300.html

[198] *Caroline Humer*, " IBM to Buy Pricewaterhouse Consulting," Yahoo News, Tue Jul 30, 8:15 PM ET.

See: http://story.news.yahoo.com/news?tmpl=story2&cid=569&e=4&u=/nm/20020731/tc_nm/services_pricewaterhouse_dc_8

[199] Sir Christopher Gent, "Don't Shoot the Messenger," *The Guardian. Finance*, August 3, 2002, p. 16.

[200]Scott Moritz, "Cash Flow Worries Shadow Sprint," *The Street.com*, 07.26.2002.

See: http://www.thestreet.com/tech/scottmoritz/10034424.html

[201] See: http://www.redherring.com/insider/2001/0806/1250019925.html

[202] See: http://www.businessweek.com/magazine/content/02_06/b3769074.htm. It is noteworthy that Verizon is mentioned as an established carrier in 1996 when in fact it was not founded until 2000. Of course as a Baby Bell was an established carrier.

[203] See: http://www.plunkettresearch.com/finance/financial_overview.htm

[204] This concept was introduced in a speech by Dwight Eisenhower in 1961.

See: http://coursesa.matrix.msu.edu/~hst306/documents/indust.html

[205] See: http://news.bbc.co.uk/1/hi/business/2145193.stm

[206] See: http://www.accountingweb.com/news/

[207] See: http://finance.pro2net.com/x34614.xml.

[208] See: http://www.accountingweb.com/news/

[209] See: http://finance.pro2net.com/x34614.xml. Firms such as EDS are in many Internet activities particularly with respect to education.

[210] This was available at http://www.ibig5.com/financial.cfm but since then the big five has become the big 4. See: http://www.big4.com/big4/B4FinancialInfo.aspx

[211] See: http://www.big4.com/big4/B4FinancialInfo.aspx

[212] See: http://finance.pro2net.com/x34615.xml. For a discussion that these are not a co-incidence See:
http://www.smartmoney.com/print/index.cfm ?printcontent=/aheadofthecurve/index.cfm?story=20020712
Dan Gillmor, "Insiders want us to believe it's all just coincidence," *Mercury News Technology*, Posted on Tue, Jul. 30, 2002.

See: http://www.siliconvalley.com/mld/siliconvalley/3767541.htm

[213] Cf. Ien Cheng, "Survivors who laughed all the way to the bank," *Financial Times*, July 31, 2002, p. 7.

[214] See: http://www.plunkettresearch.com/finance/financial_overview.htm

[215] For instance, Andersen, in its new guise as Accenture, has just produced a comprehensive report on e-government.

See: http://www.accenture.com/xd/xd.asp?it=enWeb&xd=newsroom\epresskit\egov\epres_realizing.xml. Recently there have also been cases where the accountancy firms are auditing government departments which they then claim to be exempt from further examination. This is posing new challenges for the traditional question: who inspects the inspectors?

[216] See: http://news.bbc.co.uk/1/hi/business/1917627.stm

[217] Stephen Rosenbush and Heather Timmons, "Inside the Telecom Game," Business Week, August 5-12 2002, pp. 64-70.

[218] See: http://www.snl.com/press/20000224.asp. For more stats concerning banks and money companies

See: http://www.plunkettresearch.com/finance/financial_overview.htm.

[219] See: http://www.hereinreality.com/news/axis.html#5. Cf. the recent book by Dan Brody on: The Iron Triangle: Inside the Secret World of the Carlyle Group. These connections have continued in the 2003 Iraq war. Jamie Doward, "'Ex-presidents club' gets fat on conflict," The Observer, 23 March 2003.

See: http://observer.guardian.co.uk/iraq/story/0,12239,919897,00.html.

[220] See: http://www.boursorama.com/infos/actualites/detail_actu_societes.phtml?news=938061. Here one of the interesting developments has been a move by Sagem. Cf. "Sagem s'invite par surprise dans le capital de Gemplus," *Le Monde*, Paris, 04.12.02 | 12h32.

See: http://www.lemonde.fr/article/0,5987,3234--300807-,00.html

[221] Cf. www.viasystems.com

[222] This was at site http://www.clw.org/sept11/1. Interestingly enough it is now to be found under October 11: http://www.clw.org/sept11/pakupdate1012.html

[223] See: http://www.marsh.com/MarshPortal/PortalMain?PID=AppDocumentListing&t=1057142817468&2=inEnglish&1=AboutMarsh

[224] Meanwhile, in 2000, a European firm, Gerling Global was one of the six largest insurance and re-insurance companies in the world. Two years later it is near bankrupt.

[225] See: http://www.conspiracyplanet.com/channel.cfm?ChannelID=67

[226] For past examples see: http://www.benbest.com/business/finance.html Sheila McNutty, "Chevron reports 80% fall in earnings," *Financial Times*, 31 July 2002, p. 18.

See: http://yahoo.smartmoney.com/bn/index.cfm_?story=20020801084928&afl=yahoo

See: http://www.hereinreality.com/news/axis.html#5

See: http://www.americanfreedomnews.com/afn_articles/bushsecrets.htm

Cf. Ahmed Rashid, *Taliban: Militant Islam, Oil, and Fundamentalism in Central Asia* (Yale UP, 2000).This was available at: http://www.worldpress.org/specials/pp/pipeline_timeline.htm and is now available at http://www.hartford-hwp.com/archives/51/119.html

See: http://dir.salon.com/tech/feature/2001/11/19/bush_oil/index.html

See: http://www.defenders.org/wildlife/arctic/armyths.html

See: http://ist-socrates.berkeley.edu/~pdscott/qfmobil.html
See: http://dir.salon.com/tech/feature/2001/11/19/bush_oil/index.html
FLASH 36: Is US Arms Buildup In Response to Crisis in Saudi Arabia ? (8/3/02)
See: http://ist-socrates.berkeley.edu/~pdscott/qfsaud.html
This link is no longer available: http://www.orlandosentinel.com/news/opinion/orl-edpkelly02080202aug02.story_?coll=orl-opinion-headlines
By: Lee Siu Hin, "Oil Wars. Palestine, Iraq, Cuba and Venezuela - The Oil Connection. The politics of the covert oil war in 2002."
See: http://www.change-links.org/Oilwars.htm
Cf. "Het nieuwe grote spel, De groene Amsterdamer, 6-10-2001.
See: http://www.groene.nl/2001/0140/jb_oliespel.html.

[227] James Woolsey, Tenemos que demantelar el poder del arma petrolifera Saudi, *El Pais*, 3 August 2002, p. 4. FLASH 36: Is US Arms Buildup In Response to Crisis in Saudi Arabia? (8/3/02)
See: http://ist-socrates.berkeley.edu/~pdscott/qfsaud.html
See: http://www.groene.nl/2001/0140/jb_oliespel.html

[228] Michael Geist," US extends its hegemony over the Net," *Toronto Star*, 3 June 2003.
See: http://shorl.com/jegijotejivo

[229] Timeline of Competition between Unocal and Bridas for the Afghanistan Pipeline.
See: http://www.hartford-hwp.com/archives/51/119.html.

[230] See: http://www.saic.com/about/timeline/2002.html

[231] "CIA worked in tandem with Pak to create Taliban" *Times of India*, 7 March 2001.
See: http://www.multiline.com.au/~johnm/taliban.htm. Cf. "The Taliban, CIA and Oil." *World Press review Online*, 18 October 2001.
A related article at http://www.worldpress.org/Americas/169.cfm is no longer extant.

[232] *Peter Dale Scott*, Poppy Paradox - U.S. War in Afghanistan Boosts Terror Funds, *Pacific News Service, Aug 01, 2002.*
See: http://news.pacificnews.org/news/view_article.html_?article_id=824.

[233] See: http://www.mail-archive.com/do-wire@tc.umn.edu/msg00544.html

[234] Shaykh Dr. Abdalqadir as-Sufi, "Now it is Clear! A Ramadan Review."
See: http://www.murabitun.org/article12.html
See: http://www.ilbolerodiravel.org/filosofia/SAQ_Iraq_03.htm
Cf. The Kuffar move to the Endgame,
See: http://www.geocities.com/Athens/Delphi/6588/endgame.html and the Battle of the Oil Barons.
See: http://www.islamidag.dk/

[235] See: http://www.fromthewilderness.com/ cited by Michel Bauwens in Global Governance, July 2002.

[236] Some insist that the real story involves the US quest for oil.
See: http://www.fromthewilderness.com/free/ww3/02_11_02_lucy.html
The following two references are no longer extant:
1) See: http://globalfire.tv/nj/e2001/politics/wtc_mossad.htm
2) See: http://www.greenspun.com/bboard/q-and-a-fetch-msg.tcl_?msg_id=007uDJ

[237] See: http://www.pbs.org/newshour/updates/egypt_06-04-02.html. There are many unexplained aspects of the event. For instance, some claim that it was actually a military missile rather than a passenger jet which hit the Pentagon.

See: http://www.asile.org/citoyens/numero14/missile/temoins_fr.htm
http://www.asile.org/citoyens/numero13/pentagone/erreurs_en.htm
http://www.asile.org/citoyens/numero14/missile/trou_fr.htm
http://www.asile.org/citoyens/numero14/missile/missile_fr.htm

[238] See: http://www.savethemales.ca/130202.html.
"The attack on the World Trade Center gave Bush an excuse to launch an undeclared war on Afghanistan, and possibly extend it to Iraq. Thus, it is not surprising that Bush and Cheney both made calls to Senator Majority Leader Tom Daschle asking him to limit his investigation of the WTC attack…. (*CNN.com* Jan.29).
Possibly they don't want Congress to ask why on Sept. 11 the National Command Authority waited for 75 minutes before scrambling aircraft, even though it was known that four simultaneous hijackings had occurred an event that has never happened in history. Or, perhaps they do not want to examine reports of explosions at the base of the World Trade Center buildings. Never before have buildings collapsed due to fire alone. Or perhaps they don't wish to ask what happened to the five Israelis who were arrested in New Jersey apparently celebrating the WTC collapse."

[239] Cf. http://www.darpa.mil/iao/BSS.htm;
See: http://www.lanl.gov/worldview/news/pdf/anthrax.pdf;
See: http://www.pogo.org/m/ep/ep-platts.pdf;
See: http://www.hopkins-biodefense.org/pages/agents/anthraxprimer111401.html

[240] Chris Mooney, The Secret War on Tom Daschle," The American Prospect, *Web Exclusive: 7.2.01*
Cf. http://www.prospect.org/webfeatures/2001/07/mooney-c-07-02.html

[241] For an insightful view of how others are looking differently see: Kishore Mahburani, *Can Asians Think ? Understanding the Divide between East and West*, Southrovalton, Vermont: Steerforth Press, 2002.

[242] In 1976, after George Bush was appointed head of the CIA, at his confirmation hearings, he is reported to have said: "I think we should tread very carefully on governments that are constitutionally elected."
See: http://prorev.com/bush2.htm

[243] Cf. http://www.suntimes.com/output/couch/cst-spt-greg01.html.

[244] Robert King, Ross Levine, "Finance and Growth: Schumpeter Might Be Right," *The Quarterly Journal of Economics*, Volume 108, Issue 3, August 1993, pp. 717-37.
See: http://ideas.repec.org/a/tpr/qjecon/v108y1993i3p717-37.html.

[245] Marco Travaglio e Peter Gomez, *Berlusconi*, Turin: Stampato in proprio ufficio parlemantare dell On. Gianni Vattimo, 2003.
See: http://www.giannivattimo.it/newsletter/.

[246] Elisabeth Becker, "U.S. suspends some military aid over international court," *The New York Times*, 2 July 2003.
See: http://seattlepi.nwsource.com/national/129066_court02.html

[247] *Above the Law: Secret Deals, Political Fixes and Other Misadventures of the U.S. Department of Justice.* New York: Scribner, 1996.
Cf. http://www.namebase.org/sources/YK.html;
http://www.epic.org/epic/board/burnham/

http://www.epic.org/epic/board/burnham/book.html. Ironically, it is in the law courts that so many American films, television series and especially soap operas are centred: perhaps precisely because one believes the legal framework can be circumvented.

[248] See: http://www.tvtome.com/tvtome/servlet/ShowMainServlet/showid-1385/

[249] See: http://www.guerrillanews.com/counter_intelligence/doc233.html

[250] See: http://www.judicialwatch.org/2221.shtml

[251] See: http://www.cepr.net/treasury_tanzania.htm

[252] See: http://news.bbc.co.uk/2/hi/americas/3003886.stm

[253] See: http://www.dartreview.com/archives/000946.php. This is an almost humorous example. Less so is the book by Brian J. Karem, *Above the Law*, New York: Pinnacle Books, 1999 which tells the story of Thomas Capano.

[254] Some, of course, would claim that all this needs to be seen in a wider context of globalization. For instance, according to the theses of Michael Hardt and Antonio Negri's *Empire*:

> we have been living since 1989 in an imperial inside that recognizes no outside. This space is characterized by several tendencies: by a transition from discipline to control, by an increasing imperialization of work, by an internationalization of hegemonic politics through the G8states, transnational corporations and organizations such as the WTO, IMF or the World Bank.

Cited by the European institute for progressive cultural policies (eipcp), Vienna, 20 June 2003. [contact@eipcp.net].

Cf. http://www.republicart.net/disc/empire/index.htm.

Others such as Fukayama have argued that we are entering the end of history and the triumph of markets and liberal democracy. Along similar lines Kingworth has argued that consumerism is leading to a clash of civilisations. Paul Kingsworth, "The next clash of civilizations?," *Open Democracy*, 16 1 2002,

Cf. http://www.opendemocracy.net/debates/article-6-27-282.jsp. Samuel Huntingdon set out to counter Fukuyama's thesis claiming that the source of conflicts are not ideological or economic, but cultural. Unfortunately, Huntingdon's crude maps of the world in terms of the West and the rest either consciously distort or simply are unaware of many historical and present complexities. Cf also Paul Thomson, Liberalism, contested communities and the clash of civilizations, June 2002.

See: http://www.renewal.org.uk/issues/Web%20content/Clash%20of%20civilisations.htm.

European discussions, especially in French with clear distinctions between (economic) globalisation and (cultural) mondialisation deserve much more attention.

Cf. http://www.mondialisations.org/mondial/public/pages/index.html

See: http://www.academie-universelle.org/annexes/mondial.htm;

See: http://www.cyberhumanisme.org/repertoire/humanisme.html.

These are important discussions which will be studied at the new European University of Culture (Strasbourg) and go far beyond the scope of this modest paper.

[255] See: http://www.airspan.com/home.html#. A Michael C. Desch is active in military theory and international activities:

See: http://www.carlisle.army.mil/ssi/pubs/2001/cities/cities.htm . Interestingly enough a Joseph Desch was director of Research at the NCR from 1938 onwards and was closely linked with America's cryptography activities.

See: http://ei.cs.vt.edu/~history/WAVES.pdf.

[256] SEC Chief Scorches WorldCom, WASHINGTON, July 2, 2002CBS News.com. See: http://www.cbsnews.com/stories/2002/06/25/national/main513425.shtml:

[257] See: http://www.nwfusion.com/columnists/2001/0604anderson.html. Cf. Dan Briody, "MEN Behaving Badly," *Red Herring*, July 2002, pp. 43-45.

[258] These are also fields to which Jeremy Rifkin has drawn attention in books such as *The End of Work*, *The Age of Access* and *the Biotech Century*.

[259] Traditionally this was linked with faith in the religious sense along with the other two cardinal virtues of love and hope.