

Computing the American Way: Contextualizing the Early US Computer Industry

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Drawing on work from business, social, and labor history, this article reinterprets the early domestic US computer industry in its broader economic and political context. Contrary to popular imagination, the early computer industry emerges as one devoted primarily to government business, liberal in its political leanings, and with a paternalist corporate culture profoundly shaped by the threat of unionization.

A great deal has been written about the early days of the American computer industry, but most work has been tightly focused on technical developments or on the internal stories of particular firms. This article reinterprets the early domestic US computer industry in its broader economic and political context, drawing on work from business, social, and labor history. Its genesis came from my participation in the Software for Europe project, for which Americanization emerged as a major concern. However, it is intended more as a complement to the project's work on this theme than a contribution to it. Americanization is a concept used primarily outside America, in a variety of contexts. Framing global modernization as "Americanization," however, often enshrines a cartoonish vision of America: a colossus of materialism, prosperity, high technology, crassness, and unreflective action.

Within this context, the American computer industry might be assumed, particularly by Europeans, to be an exemplar of free market enterprise, entrepreneurial innovation, ununionized work, and ruthless individualism. But this is not entirely true. Neither is it easy to pin down what is or is not definitively American. Americans do indeed talk a great deal about the essence of America and its special place in the world—an idea captured nicely in Superman's eternal fight for "Truth, Justice, and the American Way." Yet, as Americans themselves are well aware, fidelity to the true soul of America is a rhetorical position often claimed by both sides in the debates that have gripped the country since its founding.

In the pages that follow, I situate the early computer industry within some of those debates, as a paradigm of one particular kind of Americanness. This article is a synthesis and reinterpretation of the existing literature, much of which has a narrow or technical focus. Contrary to popular imagination, the early computer industry emerges as one devoted primarily to government business, liberal in its political leanings, and with a paternalist corporate culture profoundly shaped by the threat of unionization. Its roots go back to the office equipment industry of the 1880s, which by the 1920s developed as a leader in the welfare capitalism movement. I focus particularly on the shifting political economy of the US from the 1930s onward, as dramatic expansions in federal government activity during the New Deal, World War II, and early Cold War made it the leading creator of demand for administrative technology and technical computing services.

By the 1960s, the computer industry embodied American leadership in the world of high technology, and its leading companies represented a new vision of America as a place of political consensus in which business and government worked closely together, workers enjoyed excellent benefits and conditions, and technological advances created a more efficient and orderly world.

"Corporate liberal" roots

America's first standard commercial computer, the Univac I, was installed in the US Census Bureau in 1951. It is hard to talk about an American computer industry prior

to this date, despite the existence of a few one-off development contracts. Nevertheless, almost all the firms that would go on to compete credibly in the computer market of the 1950s and 1960s were already in existence. They just weren't making computers yet.¹

The new industry developed rapidly. By the mid-1950s, IBM had already established its dominance of the US computer market. People joked that the early computer industry of the 1960s consisted of IBM and the Seven Dwarves—Burroughs, Sperry Rand (parent of Univac), Honeywell, NCR, General Electric, RCA, and the Control Data Corporation. Although the American computer industry was a convergence of several streams of technological and industrial evolution, historians agree that the office machine industry was its most important antecedent. Not only the mighty IBM but also Burroughs, Univac, and NCR can trace their roots to the early days of the office mechanization boom in the late 19th century.²

Our knowledge of the internal cultures, political roles, and typical worker experiences within these firms remains surprisingly skimpy. Indeed, reading the history of computing literature it is often easy to forget that these firms employed workers other than managers or engineers. In fact, office machine companies were prominent among the “welfare capitalism” movement of the early 20th century. Under welfare capitalism, companies provided their workers with pension schemes, healthcare, recreation clubs, and even housing. National Cash Register, the firm where IBM's Thomas J. Watson Sr. learned the office equipment business, was a leader in this movement during the 1910s and 1920s. It was known for its worker suggestion schemes, company picnics, adult education offerings, sports grounds, and cultural events. NCR even hired a welfare worker and attempted to reform inhabitants of the local slum.³ Its leader, James Patterson, combined this commitment to worker welfare with an astonishingly capricious management style, frequently purging his subordinates and, on one occasion, the entire executive team.

Welfare capitalism was in part an extension of the Progressive Era's reformist spirit into business management and was closely tied to the emergence of personnel management as a corporate function and occupational specialty. The American office equipment industry boomed in part because of the success these companies enjoyed in promoting their machines as physical

manifestations of the vogue for systematization, efficiency, and modernity. So it is not surprising that many of them embraced a similarly modern and progressive approach to labor relations.⁴ Elspeth H Brown has recently shown that NCR made effective use of its factory improvement schemes for publicity purposes, using photography to create a “showcase for progressive business practices” that would “circulate in a global network of Progressive-era conferences, exhibitions, and educational endeavours.”⁵

Watson carried welfare capitalism practices into IBM, although it was not until the 1930s that the company grew large and profitable enough to support a similarly grand array of schemes.⁶ His son and successor, Thomas J. Watson Jr., noted that during the 1920s “there was no money available to duplicate Patterson's handsome factory buildings and his generous benefits programs. Father used showmanship instead ... every kind of fanfare was tried to create enthusiasm.”⁷ Watson relied on cheaper measures such as band concerts, baseball games, and company outings rather than high wages or formal pension programs.⁸ Employees were expected to sing from the company song book and study Watson's writings carefully. Corporate events had the flavor of religious revivals in which commercial success and personal virtue were intertwined. Songs echoed traditional Christian themes, putting Watson in an almost saintly light. A recent analysis of the IBM songbook identified paternalism, evangelism, and celebration of sales as its main lyrical concerns.⁹

These attempts to remake both companies and workers into more perfect forms reflect the faith of many American business leaders in the special character and unique virtue of their nation. Business leaders in favor of welfare capitalism have been called “corporate liberals” by historians. Politically, however, even advocates of welfare capitalism were usually no more tolerant of government interference in their business, worker rights, or labor unions than their conservative colleagues. Both sought unchecked power over their workers and the elimination of socialist sentiment, whether this was achieved through company-sponsored art classes and sports leagues or, as was more traditional, violent intimidation.

Administering the New Deal

America's national love affair with capitalism, big business, and free markets did not

survive the 1930s intact. Franklin Roosevelt used the decade-long economic emergency to justify a huge range of New Deal government programs that would have been anathema during a time of prosperity. Labor unions were given legal backing, prices and wages regulated, the banking industry was fundamentally restructured under tight government control, a state pension scheme was introduced, and millions went to work on the government payroll engaged in reconstruction projects.

Thomas J. Watson Sr. was Roosevelt's closest ally in the business community, something of a surprise as he had also expressed great admiration for Roosevelt's Republican predecessors. One biographer suggests that "Watson was apolitical; he identified with authority and the repositories of power regardless of party."¹⁰ Watson courted publicity, giving himself and his firm a much higher public profile than IBM's status as a medium-sized producer of specialized business products otherwise warranted. His son notes that Watson had managed to make himself "much more famous" than IBM itself.¹¹ At a time when most businessmen were vilified by the popular press, Watson established himself as the model of the enlightened and forward-looking industrialist.

Watson had supported and helped to fund Roosevelt's election campaign. He continued to speak out in favor of Roosevelt's policies even after the New Deal's early radicalism alienated the vast majority of corporate leaders. From 1933, he would correspond with the president on a weekly basis, volunteering IBM's services to perform statistical analysis on the economic impact of New Deal programs.¹² Watson Jr. recalls that his father slept in the White House several times as Roosevelt's guest and was flattered by the president's attentions, which allegedly included a proffered cabinet post as commerce secretary. He served instead "unofficially, as Roosevelt's representative in New York." In this capacity, he entertained foreign dignitaries with lavish, quasiofficial dinners with business leaders during their visits to the US.¹³

Watson supported the right of workers to unionize but remained keen to make sure that his own employees did not choose to exercise it. In the 1930s, as most companies practicing welfare capitalism cut back or abandoned their programs, IBM bucked the trend with higher wages, a pension system begun in 1934, health insurance, and in

1935, it built a country club open to all workers. By the same year, piecework had been abandoned at all IBM factories. He also favored promotion from within and education programs for workers, providing workers with the same kind of prospects for internal mobility won by unionized workers.¹⁴ David L. Stebenne has recently surveyed the development of IBM's personnel policies during this era, drawing connections between Watson's management policies and his public involvement with New Deal policies.¹⁵

One need not be a cynic to note that Watson's devoted support of Roosevelt and the New Deal was in his firm's own interest. IBM's tabulating business had its roots in the contract Herman Hollerith received to build machines for the 1890 US Census. However from 1930 to 1932, immediately prior to the New Deal, government business accounted for only one or two percent of the firm's revenues (and was shrinking as the census bureau returned equipment to cut costs).¹⁶ Thanks to the New Deal, the federal government was growing rapidly at a time when most private industries were unable to make new investments. The 1935 passage of the Social Security Act created a massive new market for tabulating machines, which were used to keep records for the program and to issue payments. Social Security payments were made via special checks issued on punched cards, giving many people their first sight of machine-processed data.

By 1937, IBM had already provided social security offices around the country with more than 400 tabulators and 1,200 key-punches.¹⁷ As well as establishing the Social Security Agency itself as a leading user of tabulating machines, this—like other New Deal initiatives—imposed new and complex record keeping and reporting obligations on private businesses, such as carefully documenting wages and hours worked.¹⁸ This increasing bureaucratization of employment also helps to explain why payroll processing was established as a key application for tabulating machines by the 1940s.

In 1936, the first shipment of punched-card machines to the Social Security Administration was made. IBM's sales revenues, which had been stagnant since the late 1920s, jumped by approximately 20% and continued to rise rapidly for the rest of the decade. Watson himself achieved new celebrity as America's highest-paid man.¹⁹ By 1940, IBM's revenues were more than double its 1935 levels.²⁰

World War II

Unemployment vanished after 1941 with America's entry into World War II and its industrial mobilization on an unprecedented scale to create the ships, planes, vehicles, and other war supplies. This further shifted the relations of business and government, turning the government into the dominant customer for manufactured goods and adding thousands of executives to the public payroll as temporary government administrators.

Even the production of simple business machines such as typewriters was determined by production quotas and distribution priorities set by the War Production Board.²¹ NCR rolled out aircraft engines, gun magazines, and rockets as well as inventing special code-breaking equipment. Burroughs built the famous high-precision Norden bomb-sight, a special-purpose analog computer. IBM produced guns and other military items as well as delivering punched-card machines in record numbers for wartime administrative and technical computing purposes. Members of the armed services were given special training with IBM punched-card machines, and the firm sent experts to work with the government in developing new procedures and applications. IBM also built new products, including mobile punched-card facilities for field use by invading forces and new products for the remote transmission of machine-readable information via teletype and encrypted radio.²² It contributed to operations research analysis for antisubmarine warfare and performed calculations for ballistics and weather forecasting.²³ Thanks to all these wartime contracts, IBM's revenues further tripled between 1940 and 1945.²⁴

In 1945, as the war came to an end, many worried that America would lapse back into a recession when this massive stimulus was withdrawn. In fact, years of pent-up demand ensured that the economy continued to grow, with high technology companies like IBM, RCA, and General Electric leading the way. The corporate liberals played an important role in constructing the political economy of the early Cold War era and stabilizing the conditions for their own future success.

Welfare capitalism reborn

Nobody knew which New Deal measures would become permanent when prosperity returned. During the late 1940s, the country's future direction was uncertain and

bitterly contested. Division of power between employers, labor unions, and government remained the key domestic political issue. Harry Truman, Roosevelt's successor, struggled to deal with a wave of strikes. Republicans pledged to roll back many New Deal reforms. In 1946, campaigning with the slogan "Had Enough?" they won a majority in both houses of Congress.

The Taft-Hartley Act greatly limited the scope of political action by unions, preventing them from funding political parties or striking in support of other unions. It also let the federal government break strikes and forbade communists from holding office within unions. In response to Taft-Hartley, unions retreated from general political involvement and the interests of the working class in general, instead focusing on the direct economic interests of their members. The shift was cemented in the so-called "Treaty of Detroit" agreed in 1950 between the United Auto Workers union and the major American car companies. This ended a period of labor militancy and frequent strikes. American business was partitioned into union and nonunion sectors.

Companies could stave off the threat of unionization if they provided competitive wages and the other benefits enjoyed by unionized workers. In his book *Modern Manors: Welfare Capitalism Since the New Deal*, Sanford Jacoby has persuasively argued that the human resources policies adopted by modern corporations of the 1960s were a modernization and broad dissemination of the traditions of welfare capitalism practiced prior to the war by firms such as IBM and NCR. Companies sought to bridge class barriers by creating "bonds of shared belief, ethnicity, and gender" so that workers felt themselves part of industrial communities in which they aspired to rise through the corporate ranks. Profit sharing and the creation of internal labor markets bound workers more closely to firms.²⁵

IBM and NCR fit this model, building carefully on their welfare capitalism traditions and strong corporate culture while modernizing both for an era in which management was based more on committee and less on dictatorial whim. Elizabeth Fones-Wolf has argued that World War II played a key role in reviving welfare capitalism at firms such as NCR, which had fallen on hard times in the 1930s but took advantage of wartime prosperity and decreased union opposition to experiment with new programs aimed to

win worker loyalty.²⁶ They mirror Eastman Kodak, one of Jacoby's main case studies, as leaders in the welfare capitalism movement that retained their programs through the depression, enjoyed prosperity during the 1940s and 1950s in technological niches with little competition, and developed highly distinct corporate cultures based on the internal promotion of managers.

Their benefit programs and grievance procedures gave union organizers little to appeal to other than resentment of managerial paternalism. Thus, by the 1960s, both IBM and NCR had taken steps to retire the most obviously paternalist elements of their cultures. Watson Jr. was later critical of the "cult like" atmosphere created around his father.²⁷ His father's style of celebration with its public carnivals, company songbooks, picnics for thousands, rallies, and fireworks seemed outmoded.²⁸ At NCR, Patterson's reign of terror was followed in the 1950s by a calmer style of leadership under Stanley C. Allyn. In his autobiography, Allyn struck a similar balance in honoring his predecessor but updating his legacy, stressing the extent to which his own initiatives, such as a golf course, a systematic complaints system, and consultation with workers, built on Patterson's principles. He lauded Patterson's commitment to the well-being of the workers while documenting his flaws and eccentricities.

IBM's North American operations were never unionized, but the threat of unionization continued to shape its culture. Its ballyhooed "open door" policy allowed employees to go over the heads of their bosses, even to Watson himself, with complaints or neglected ideas. This was stressed within the company and was also featured prominently when Watson Jr. delivered a series of lectures in 1962 on "A Business and Its Beliefs." Watson claimed that this might make "many a traditional manager's blood run cold" because "whenever a manager makes a decision affecting one of his people, he knows that he may be held accountable to higher management for the fairness of that decision."²⁹

By 1969, IBM was introduced by the author of a history as "the world's largest non-union company," having grown to more than a quarter of a million workers and having become America's sixth largest industrial firm measured by revenue.³⁰ According to Nancy Foy, author of a 1974 study of IBM's history and culture, "incurring a unionization threat is a cardinal sin in IBM terms." She explains that in 1960 the manager of

the firm's Data Processing Division was removed from his post after a subordinate cut costs too aggressively and left workers delicately hinting that unionization was looking more attractive.³¹

The culture of IBM remained a distinctive blend of paternalism and Darwinian struggle for survival. Lower-level employees received more coddling, in part to ensure that unionization remained unattractive and turnover minimal. They benefited from education programs, internal labor markets that offered the chance of rising from low-level jobs into professional positions, job security, and excellent benefits.

Managers, on the other hand, especially at the more senior levels, were at constant risk of being removed from their posts if they failed to meet targets or deliver promised projects within time and budget targets. They struggled mightily to win promotions. Yet, they were not often fired. According to Foy, "once the company has selected a man and trained him, it has assumed a responsibility for him." Managers who failed at one task would be placed elsewhere. In reality, the firm might just "put a man in a backwater where he can cause no trouble and then forget him. Eventually the man in Siberia is expected to retire or be paid off to leave—but he is never directly ill-treated."³¹

International engagement

Business leaders, among them Thomas Watson, played an important role in shaping America's engagement with the world in the years after World War II. While the ensuing Cold War with the Soviet Union might seem inevitable, in retrospect, it took several chaotic years for a political consensus to develop around this struggle. Initially, the dominant Republican faction was fervently isolationist, opposed to the formation of NATO and the United Nations, deeply uneasy about the Marshall Plan, and more focused on the threat of unchecked government spending at home than of communism abroad.

Watson had been a champion of world trade since the dark days of the protectionist 1930s, serving as head of the International Chamber of Commerce in 1937. His faith in the moderating influence of increased trade with Nazi Germany and the USSR would later cause some embarrassment.³² IBM opened small operations in dozens of countries, many of them named "Watson Business Machines" rather than IBM. He toured these scattered outposts frequently and with

great pomp, collecting medals from local dignitaries. However, even at their interwar peak in 1935, IBM's foreign operations accounted for no more than \$1.6 million of its \$21 million in revenue.³³

Immediately after the war, the formation of the UN created controversy within the US. It reopened old partisan debates about the proper level of American entanglement with the outside world. Again, the corporate liberals acted to support international engagement. In particular, Watson Sr. was a fervent UN supporter, committing IBM staff to the support of its New York operations.³⁴ Among the attendees at Watson's funeral in 1956 were Secretary of State John Foster Dulles and UN Secretary General Dag Hammarskjöld.³⁵ Watson retained his belief in world peace through world trade, creating the IBM World Trade Corporation in 1949 to consolidate control of IBM's international business in the hands of his son Dick (actually Arthur) Watson. Upon its foundation, it already included sales offices in 58 countries.³⁶ IBM's foreign operations grew even more rapidly than its domestic business over the following decades, and by 1973, it provided most of the firm's profits and almost half of its revenues.³⁷

At NCR, Allyn shared Watson's belief in the power of world trade to bring global peace and prosperity and took part in UN and UNESCO delegations. Writing of his experiences visiting German and Japanese subsidiaries immediately after the war, he claimed "when we sat down to talk cash registers, accounting machines and business operations we needed no cultural, religious or social interpreters. We spoke a common language, believed in identical principles, sought mutual objectives. ... [T]rade is perhaps the best of all meeting grounds."³⁸

The New Deal Order

In the elections of 1948, the Republicans planned to retake the presidency, expand their majorities in Congress, and repudiate the New Deal once and for all. Yet, when the votes were counted, Truman had pulled off the biggest political upset of the century. Democrats regained majorities in both chambers, and the Republican assault on the New Deal legacy was checked. Over the 62-year period from January 1933 to January 1995, the Republicans held majorities in the House for just two years and the Senate for just 10 years (six of those in the 1980s). An unofficial block of Southern conservative

Democrats and conservative Republicans held an effective veto over legislation for most of this period.

Historians interested in the political economy of the US have come in retrospect to see the entire period from Roosevelt's election in 1932 to Regan's triumph in 1980 as a single era: the New Deal Order.³⁹ It was characterized by government regulation of key industries (banking, telecommunications, airlines, and public utilities); a patchwork of social programs to support the poor, elderly, and disabled; and industrial unions focused narrowly on defending the interests of their existing members, progressive taxation, and a broadly Keynesian commitment to an active role of the government in managing economic cycles. By the 1950s, a similar general consensus on foreign policy ensured that both parties supported massive Cold War defense spending, a global commitment to fight against the expansion of communist influence, and the expansion of free trade. While Democratic presidents were more likely to push for the expansion of government programs—most notably Lyndon Johnson's hugely ambitious Great Society initiatives—Republican presidents did not disrupt the status quo. Even Richard Nixon, an exceptionally divisive and partisan leader, extended government oversight of industry with the creation of the Environmental Protection Agency. Only the economic crisis of the 1970s and the growing power of the conservative movement brought this fundamental consensus to an end.

The New Deal Order provided exactly the foreign and domestic conditions best suited for the growth of the computer industry during the 1950s and 1960s. The values of internationally minded corporate liberals such as Thomas Watson were triumphant, while the combination of Cold War spending and a booming international economy laid the foundations for rapid and sustained business expansion.

Stability in Congress encouraged moderation of the domestic policies of successive presidents. A popular military leader with no obvious political beliefs, Dwight Eisenhower represented the liberal wing of the Republican party in his successful 1952 campaign to reclaim the White House after five successive defeats for his party. Eisenhower was a paradox. His administration built the Cold War version of the New Deal Order that would endure for decades. In this sense, he deserves to be remembered as

a transformational president, yet this transformation consisted of accepting and entrenching the fragile status quo that existed at the start of his presidency.

In Eisenhower's America, unions were neither outlawed nor freed from the restrictions imposed by the Taft-Hartley Act. Government regulation of key sectors of the economy was neither deepened nor abolished. The Social Security system of state pensions remained in place, but the US failed to follow the pattern of other industrialized democracies in creating a national healthcare system.

Eisenhower's reassuring persona was needed because the 1950s were not nearly as dull at home or abroad as popular memory would have it. Only in hindsight, and through the monochromatic lens of television, do the 1950s seem a time of inevitable consensus, social conformity, and easy prosperity. While the economy grew strongly over the decade, it did so in fits and starts, with deep recessions in 1954 and 1958. The Korean War took America by surprise toward the end of Truman's term in office, and in early 1951, UN troops came close to suffering an abject defeat at the hands of what was then called "Red China." During the 1950s, the USSR posted record economic growth rates, apparently outstripping those of the US, and was stockpiling its own nuclear arsenal. In October 1957, the Soviets launched Sputnik, triggering a wave of recriminations within the US and a wholesale revamping of the nation's education in science and engineering.

Military spending drove developments in jet engines, rockets, atomic weapons, electronic components, and nuclear submarines. The scientists and engineers engaged in these projects viewed themselves as radical innovators, creating new technologies, systems, and managerial methods able to coordinate projects of unprecedented ambition and complexity.⁴⁰

Cold War spending ensured that the US federal government was the world's most important customer. Vast new high technology industries grew up to serve its ever-growing appetite for bombs, missiles, jets, electronics, rockets, and ships. This played an understandable role in blunting the opposition of business leaders to government spending. At the end of his time in office, Eisenhower famously warned of the danger of the massive new "military industrial complex" posed to the country's traditional individualist values.⁴¹

The corporate commonwealth

Eisenhower gave business leaders positions in his cabinet and established new networks of advisory councils to weave their influence into policy making. The 1950s and 1960s were a time of rapid and sustained growth for American corporations. The S&P 500 (an index representing the 50 largest publicly traded firms) fell in five of these 20 years, but never by more than 11 percent. Each annual decline was made up several times over the next year (with the exception of 1969, which in economic terms was the beginning of the troubled 1970s). During this long boom, computer, electronics, and other high-technology firms such as GE, IBM, Xerox, Polaroid, DEC, Texas Instruments, and ITT came to represent the new mainstream of corporate America.

IBM in particular became a quintessential blue chip stock, a "widows and orphans" investment that would provide assured dividend income for decades. Eisenhower remained close with Watson until the latter's death. Indeed, Watson's authorized biography (ominously titled *The Lengthening Shadow*) begins with the text of a short letter Eisenhower wrote to Watson in 1949 urging him to consider commissioning a biography because "an account of your life would be a story of practicable achievement in the free enterprise system that would be far more effective in support of my argument [against paternalistic government] than almost anything else could be."⁴²

Eisenhower is remembered by historians as the personification of what is often called the "corporate commonwealth." In his classic 1982 article, "Dwight D. Eisenhower and the Corporate Commonwealth," Robert Grifith provides the following summary of this philosophy:

As president, Eisenhower sought to create a noncoercive, self-disciplined, and harmonious society by limiting the New Deal state, forging cooperative relations between business and government, promoting social harmony and consensus at home, and maintaining a stable a Western-oriented international order abroad.⁴³

As a "product of the organizational revolution that had transformed American life in the twentieth century, a member of the new managerial class that led the nation's great public and private bureaucracies," Eisenhower felt a natural kinship with his opposite numbers in the corporate world.⁴⁴ The feeling was

mutual, and Thomas Watson built an increasingly close relationship with Eisenhower from the mid-1940s onward. Watson Jr. claims that his father “was using the Truman years to build a relationship with the one American he thought was as great as Roosevelt.”⁴⁵ As a head of the board of trustees, Watson led Columbia University’s search for a new president and made the decision to offer the job to Eisenhower, an appointment that one biographer suggests “was supported by many members of the New York financial, management, real estate, and political establishment” but was opposed by many faculty members.⁴⁶ Once installed at Columbia, Eisenhower was soon trying to bring together leaders of business, labor, government, and professional groups for cooperative long-term planning. As president, he tried the same thing on national and international levels, believing that global prosperity and American self interest were inseparably intertwined.

As an editor of Eisenhower’s presidential papers, historian Lou Galambos was particularly well placed to understand the coevolution of corporate and political institutions in this era. Galambos used Griffith’s phrase in the title of his historical overview of American business “The Rise of the Corporate Commonwealth.”⁴⁷ This reflects a national system that had made a decisive break from the free market and minimal government of American myth. Galambos is most closely associated, however, with another phrase: the “organizational synthesis.” Introduced in a seminal 1970 article, this historiographic position echoed Eisenhower’s own world view: that the shift to “large national formal organizations . . . characterized by a bureaucratic structure of authority” and increasing professionalism had given business, professional, religious, reform, labor, and government organizations “orientation . . . values and . . . institutionally defined roles” similar to big business.⁴⁸

This deliberate blurring of boundaries politicized business leadership at the same time it depoliticized government administration. The Cold War required a strong and united America, committed to military strength, the aggressive containment of communist abroad, and social harmony at home. The contentment of the American worker was the best argument against communism, and it would have been hard to make that argument if the government had tolerated a return to the pre-New Deal tendency to beat, intimidate, and occasionally shoot striking workers. Meanwhile, rapid growth

in living standards and corporate profits during the 1950s and 1960s suggested that worker rights and corporate capitalism could thrive together. After being nominated as Eisenhower’s Defense Secretary in 1953, auto industry executive Charles E. Wilson defended himself from suggestions that his huge holdings of company stock might skew his actions in government with the famous rejoinder that he believed “what was good for the country was good for General Motors and vice versa.”

This depiction of the early 1950s as a time marked by the emergence of a centrist political consensus in the face of a perceived Soviet challenge might seem hard to square with popular impressions of the era as a time of witch hunts, loyalty oaths, Hollywood blacklists, and the rampages of Senator Joe McCarthy and the House Committee on Un-American Affairs. This new Red Scare led to the purging from public life of anyone with leftist sympathies (which in turn ensured the Democratic Party’s natural role as a centrist governing party in Congress). However, McCarthy soon proved an embarrassment to his own party and the anti-communist cause. His extremism alienated many business leaders, particularly those committed to international trade. Watson Jr. claims in his memoir to have attacked McCarthy as dangerously undermining America with “evil or unjustified suspicions” at the height of the latter’s fame.⁴⁹

Computing in the corporate commonwealth

Millions of Americans had their first exposure to computer technology in 1952 when a Univac correctly projected an unexpectedly strong victory for Eisenhower in the presidential election on the basis of a handful of early vote totals. The prognosticating Univac might be suspected of self interest, as the Eisenhower years saw the computer industry grow with astonishing speed. This was the key period in establishing both the technical and commercial viability of computers as tools for administration, scientific calculation, and military control. Computers and electronics came to symbolize America’s booming high-technology business sector, culminating in the stock market’s so-called “tronics boom” at the end of Eisenhower’s term in which investors rushed to purchase the stocks of firms with names such as Circuitronics and Videotronics, with little regard to their actual prospects.

Computer companies grew rapidly as an increasingly crucial part of Eisenhower's corporate commonwealth. In part, this was a natural extension of their existing strengths in administrative technology. The US Defense Department was the world's largest administrative user of electronic computers. Indeed, it was its growing array of incompatible machines that inspired the DoD to nurture the Cobol standard language and then to spur compiler development by requiring computer manufacturers to provide an implementation of the language if they wanted their computers considered for procurement.

Computer companies also moved quickly to win government contracts in new military markets far removed from their roots in the office machine business. Burroughs, renowned for its adding and bookkeeping machines, became a major supplier of military command and control systems. Office machine conglomerate Remington Rand became part of Sperry Rand, bringing expertise in computer technology to a firm best known for its specialized military automation technologies such as the marine gyro stabilizer, computer-controlled bombsights, autopilots, and airborne radar systems. Other firms that entered the computer industry in the 1950s made similar transitions. Honeywell pioneered thermostatic heating control, but it built up defense production during World War II and manufactured missile guidance systems, bombs, land mines, and napalm for the US military during the Cold War. Its computing business grew out of a 1955 joint venture with military electronics firm Raytheon. GE had previously diversified into the production of a range of equipment for producers, industrial consumers, and domestic users of electrical power. Expertise in power and turbines led to major new government contracts to build jet engines and nuclear reactors.

IBM underwent a dramatic shift toward defense work. Its first stored-program electronic computer to reach market, the IBM 701, was originally code-named the "Defense Calculator" and was launched as a response to the outbreak of the Korean War.⁵⁰ These expensive number crunchers were designed for scientific calculation and were ordered almost exclusively by defense contractors and military installations to support the development of airframes, missiles, turbines, and atomic weapons. It was so closely associated with the Cold War that the delivery schedule was drawn up not by IBM but by the National

Production Authority according to "the relative urgency of each situation."⁵¹

Even this, however, understates the importance of the Cold War's new political economy to IBM's emergence as the computer industry's leviathan. Government funds supported the development of crucial computer technologies.⁵² These funds also built up the emerging industry's capacity. In 1950, IBM accepted a government contract to produce the world's fastest computer, the Naval Ordnance Research Calculator (NORC). According to Emerson Pugh, this reflected a new policy of supporting the firm's move into electronic computers with government funding. IBM gained "favorable publicity, experience in design, construction, and maintenance of a supercomputer, and profits."⁵³

Another government contract was to be still more important. In 1953, IBM won an initial competition to supply two prototype computers for the massive SAGE air defense network.⁵⁴ Delivery of production models followed from 1956 to 1963 as the system entered operation. These were the largest standard computers ever produced, with two identical systems filling an entire floor in each of the 23 SAGE command centers. During IBM's first years in the computer industry, from 1952 to 1955, it brought to market the successful 701, 702, 704, 705, and 650 computers. Still, 80% of its revenue from stored-program computers over this four-year period came from its contract to supply the snappily named AN/FSQ-7 computer at the heart of SAGE.⁵⁵ IBM also produced Bomb-Nav analog guidance computers for use in B-52 bombers. By the end of the 1950s, IBM had installed well over 1,000 general-purpose computers within the US, but over the entire decade, revenue from these product lines was smaller than that received from SAGE and the other military computer contracts (\$705 million versus \$792 million).⁵⁶

IBM faced a new antitrust investigation from 1952 onward, centered on anticompetitive abuses of its monopoly position in the punched-card market. Watson Sr. refused to sign a consent decree issued by a judge, but his son's 1956 decision to sign the decree and make peace with the government over his father's objections signaled both the final transfer of power within the firm and the arrival of a new and less-personalized managerial culture for the new era.⁵⁷

Watson Jr. quickly produced what he claimed was the first formal organization

chart ever drawn of IBM, and he launched the first in what became a regular series of reorganizations to prune the dozens of executives reporting directly to the top and create clearer areas of responsibility and accountability. A Corporate Management Committee was established. Rhetorically, at least, the company's management and design became a more collegial affair. His father had preferred an idiosyncratic management style relying less on formal organization and more on force of personality and constant personal tinkering.

A few years later, Watson Jr. recalled, "In late 1956 ... we called the top 100 or so people in the business to a three-day meeting ... we went into that meeting a top-heavy monolithic company and came out of it decentralized."⁵⁸ According to David Hart's recent analysis of the evolution of IBM's relationship with the US government, however, Watson Jr. continued his father's pattern of personally handling IBM's political relationships. Only in 1975, after his retirement, did the firm establish a formal Washington lobbying office, something Watson criticized as "the worst way" to manage this relationship.⁵⁹

Similar transitions were taking place in other computer-producing firms. Allyn's successor at NCR, Robert Oleman, wrote that

Management by despotic rule, no matter how benevolent, has today been almost universally superseded; teams of specialists run the vast majority of today's large enterprises, and their decisions are of necessity based on much broader factors than those of a simpler era.³

General Electric, in particular, stood as the exemplar of a new and distinctively American approach to the professionalization of management in its commitment to decentralized organization, its faith in the power of managerial education, and its attempt to create a class of managers equipped with the tools to manage any part of the company.

GE also popularized the use of a multidivisional structure to manage a range of fundamentally different business units within a single corporation. Under its decentralized regime, managers were supposed to receive considerable leeway to run their own parts of the company, provided that they met agreed performance targets. Talented young managers were educated at Crotonville, its internal business school. As they rose through the ranks, they were liable to be moved

many times, to different plants, different states, and for the most successful, fundamentally different businesses.⁶⁰ Alfred Chandler set the agenda for decades of work in American business history in 1962 with his book *Strategy and Structure*, which mirrored the mood of this era by presenting the multidivisional form as the key technical innovation in the emergence of the modern corporation. A decentralized, multidivisional structure could separate activities geographically as well as by business area. Its adoption was a crucial step in the evolution of American firms into true multinational enterprises.⁶¹

Continuity and conformity in the 1960s

Space limitations prevent a thorough discussion of the developments of the 1960s. For American business in general, and the computer industry in particular, however, the decade was one of continuity rather than revolution. In this sense, the corporate commonwealth Eisenhower had established lived on well into the 1960s. To corporate leaders, particularly in the high-technology field, the challenges and priorities of business and government seemed to be growing closer together. In his 1969 autobiography, Allyn suggested that techniques pioneered by business could and should replace the messy traditions of politics. He believed that "the city is in fact a corporation" and so can be best run by experienced businessmen.⁶² Allyn funded many civic projects and charities and claimed that the selling and organizational skills of business leaders made them natural experts to run community affairs.

The Cold War remained at the center of political discourse for much of the decade and leaders were not ashamed to publically tie their own interests to those of world freedom. In 1961, Dick Watson gave the keynote speech at the annual meeting of the Systems and Procedures Association, which was home to what were called "systems men" in the US and would have been called "organization and methods" experts in the UK. Taking as his theme "major world issues," he warned of the need to "mobilize the resources of the free world" to fight the forces of international communism.⁶³ After being rejected by his brother as a possible successor to head IBM, Richard Nixon named Dick Watson Ambassador to France in 1970, repaying support during his election campaign.⁶⁴ However, Dick's growing alcoholism led to the end of his ambassadorial career in 1972 (and apparently contributed to his premature

death two years later). A few years later, Thomas Watson Jr., having retired from IBM, was serving as American ambassador to the USSR when Soviet troops marched into Afghanistan. Under his leadership, IBM had begun efforts toward sales and technical collaboration with the USSR and China in the early 1970s.⁶⁵ Their careers show the ease with which well-placed individuals could shift between political and business spheres during the final decades of the New Deal Order.

The initial impact of the celebrated 1960s counterculture on the computer industry appears to have been limited. Hippies were not welcome in the corporate world of the 1960s. Computer company employees, particularly in sales departments, were expected to dress and act like neater versions of the managers they were selling to or servicing. By the end of the 1960s, American work clothes had become more casual, and even Watson Jr. abandoned the wearing of detachable stiff collars and experimented with colored shirts. Neatly trimmed beards were glimpsed on the faces of IBM employees, although as late as 1971 Watson issued a reminder to his employees that “they looked best in white collars and short hair.”⁶⁶

Alongside a new concern over urban development and race relations, the late 1960s also saw the rise of what was then most often called the “women’s liberation movement.” Liberally minded companies such as IBM began making a particular effort to hire and retain black and female employees in more senior positions. Statistics on these areas began to appear in the firm’s annual report, and in 1971, IBM was pleased to announce the appointment of Patricia R. Harris, a black female lawyer, to its board.⁶⁷

By the end of the 1960s, some corporate leaders had begun to talk about the “social responsibilities” of their firms to address major problems such as urban poverty and racial inequality. The movement spread further during the 1970s. This was the latest evolution of corporate liberalism, and again computer companies led the way. IBM added social responsibility to its corporate mission, and in the early 1970s, employees were able to devote up to 10 percent of their working time to community projects and to apply for small cash grants for worthy organizations.⁶⁸

Supercomputer pioneer CDC was another leader in this area. Social initiatives became a personal priority for its leader, Bill Norris. He ordered factories constructed in areas of

urban blight and channeled hundreds of millions of dollars into the development of computerized education technology.⁶⁹

Conclusion

The computer firms of the 1950s were at the forefront of a number of key shifts in American business and society. As they began to market computers internationally, they represented a particular and historically grounded version of the American Way. They were at the heart of a new and enduring political consensus, favoring America’s engagement with the world and a newly active role for government in both domestic and foreign arenas. They had embraced the Cold War and used the massive expansion in military spending to support their entry into new businesses and their development of new technologies. They were not unionized, but several led the way in offering workers generous benefit packages and job security designed to keep workers so happy that they would never consider unionization. They were among the fastest-growing, most innovative firms in an era of rapid economic growth and technological advance. Theirs was not the only version of the American Way, and it did not fully survive the turmoil of the 1970s, but for a while, it seemed a product with considerable export potential.

References and notes

1. Two firms founded in 1957 did achieve real success in the computer industry by the end of the 1960s: DEC and CDC. Rather than compete head to head with the strengths of IBM and other entrenched firms, they targeted the opposite extremes of computer power, creating the minicomputer and supercomputer markets, respectively.
2. J. Cortada, *Before the Computer: IBM, Burroughs and Remington Rand and the Industry they Created, 1865–1956*, Princeton Univ. Press, 1993. The IBM story has been told in shelves of books, although these tend to recycle the same anecdotes and to focus on the outsized personalities at the top of the firm. We know much less about the experiences of mid- and low-level employees. The first few years of Univac have been addressed by several historians, but we know little of its development after the mid-1950s. NCR has received some analysis as a pioneer of welfare capitalism, and the managerial and technical woes of General Electric’s computer division are chronicled in a number of memoirs. Material on the others is still patchy.

3. A firsthand account of NCR during this era, from its future chairman, is given in S.C. Allyn, *My Half Century at NCR*, McGraw-Hill, 1967.
4. The best history of the early human resources movement and the bureaucratization of personnel management is S.M. Jacoby, *Employing Bureaucracy: Managers, Unions and the Transformation of Work in American Industry, 1900–45*, Columbia Univ. Press, 1985. An overview of welfare capitalism is presented in S.D. Brandes, *American Welfare Capitalism, 1880–1940*, Univ. of Chicago Press, 1976.
5. E.H. Brown, "Welfare Capitalism and Documentary Photography: N.C.R. and the Visual Production of a Global Model Factory," *History of Photography*, vol. 32, no. 2, 2008, pp. 137–151.
6. Watson was also inspired by a local shoe company. Endicott-Johnson was a famously progressive firm, building municipal buildings, a gold course, and sports facilities for the town and providing health and other benefits to workers. G. Zahavi, "Negotiated Loyalty: Welfare Capitalism and the Shoeworkers of Endicott Johnson, 1920–1940," *J. American History*, vol. 70, no. 3, 1983, pp. 602–620. According to Watson Jr., its founder, George F. Johnson, was a major influence on his father. T. Watson Jr. and P. Petre, *Father, Son & Co: My Life at IBM and Beyond*, Bantam, 1990, p. 67. An account of their relationship is given in W. Rodgers, *Think: A Biography of the Watsons and IBM*, Stein and Day, 1969, 71–73.
7. T. Watson Jr. *A Business and Its Beliefs: The Ideas that Helped Build IBM*, McGraw-Hill, 1962.
8. T.G. Bedlen and M.R. Bedlen, *The Lengthening Shadow: The Life of Thomas J. Watson*, Little, Brown and Company, 1962, p. 151.
9. A. El-Sawad and M. Korczynski, "Management and Music: The Exceptional Case of the IBM Songbook," *Group and Organization Management*, vol. 32, no. 1, 2007, pp. 79–108.
10. Rodgers, *Think*, p. 106.
11. Watson and Petre, *Father, Son & Co*, p. 147.
12. Bedlen and Bedlen, *The Lengthening Shadow*, pp. 185–189.
13. Watson and Petre, *Father, Son & Co*, pp. 44–45.
14. Bedlen and Bedlen, *The Lengthening Shadow*, pp. 150–154.
15. D.L. Stebenne, "IBM's 'New Deal': Employment Policies of the International Business Machines Corporation, 1933–1956," *J. Historical Soc.*, vol. 5, no. 1, 2005, pp. 47–77.
16. R. Sobel, *IBM: Colossus in Transition*, Times Books, 1981, 85.
17. Sobel, *IBM*, p. 86.
18. See L. Heide, *Punched-Card Systems and the Early Information Explosion, 1880–1945*, Johns Hopkins Univ. Press, 2009, pp. 211–221.
19. Watson and Petre, *Father, Son & Co*, p. 46. Watson was already the highest-paid man in America in 1934 when figures were first gathered, but this was not disclosed until 1936. Rodgers, *Think*, p. 127.
20. Annual figures on IBM income, net profit, and sales revenues are from Cortada, *Before the Computer*, p. 152. Cortada identifies "select sale revenues" but does not explain what this means.
21. A detailed discussion of the role of the War Production Board in coordinating wartime production of office machines is given in Cortada, *Before the Computer*, pp. 193–199.
22. E.W. Pugh, *Building IBM: Shaping an Industry and Its Technologies*, MIT Press, 1994, pp. 90–107, is by far the most complete published summary of IBM's work during the war.
23. Rodgers, *Think*, p. 150.
24. A complete annual summary of IBM's revenues is compiled in Pugh, *Building IBM*, pp. 323–324.
25. S. Jacoby, *Modern Manors: Welfare Capitalism Since the New Deal*, Princeton Univ. Press, 1997, p. 6.
26. E. Fones-Wolf, "Industrial Recreation, the Second World War, and the Revival of Welfare Capitalism, 1934–60," *Business History Rev.*, vol. 10, no. 2, 1986, pp. 234–258.
27. Watson and Petre, *Father, Son & Co*, p. 82.
28. Rodgers, *Think*, p. 226.
29. Watson, *A Business and its Beliefs*, p. 20.
30. Rodgers, *Think*, p. 9.
31. N. Foy, *The IBM World*, Eyre Methuen, 1974, p. 84.
32. Watson accepted a decoration from Hitler in 1937, returning the medal only after the outbreak of war in Europe. Rodgers, *Think*, pp. 121–127. IBM's trade with Germany in the Nazi era has been the topic of considerable controversy, most notably with the publication of the popular polemic E. Black, *IBM and the Holocaust*, Crown, 2001. Watson's 1937 call for closer ties with the USSR accompanied the restoration of diplomatic relations between the two nations. Rodgers, *Think*, p. 109.
33. Sobel, *IBM*, pp. 184–185. The figure on total revenue is from Pugh, *Building IBM*, p. 323.
34. Watson and Petre, *Father, Son & Co*, p. 162.
35. R.S. Tedlow, *The Watson Dynasty: The Fiery Reign and Troubled Legacy of IBM's Founding Father and Son*, Harper Business, 2003, p. 187.
36. Cortada, *Before the Computer*, p. 229.
37. Foy, *The IBM World*, p. 55.
38. Allyn, *My Half Century at NCR*, p. 109.
39. S. Fraser and G. Gerstle, *The Rise and Fall of the New Deal Order*, Princeton Univ. Press, 1989.
40. T.P. Hughes, *Rescuing Prometheus*, Pantheon Books, 1998.
41. D.D. Eisenhower, Eisenhower's Farewell Address, January 17 Eisenhower Nat'l Memorial, 1961;

- at <http://www.eisenhowermemorial.org/speeches/19610117%20farewell%20address.htm>.
42. Bedlen and Bedlen, *The Lengthening Shadow*, front matter.
43. R. Griffith, "Dwight D. Eisenhower and the Corporate Commonwealth," *American Historical Rev.*, vol. 87, no. 1, 1982, pp. 87–122, 100.
44. Griffith, "Dwight D. Eisenhower and the Corporate Commonwealth," p. 88.
45. Watson and Petre, *Father, Son & Co*, p. 163.
46. Rodgers, *Think*, pp. 204–208.
47. L. Galambos and J. Pratt, *The Rise of the Corporate Commonwealth: United States Business and Public Policy in the 20th Century*, Basic Books, 1987.
48. L. Galambos, "The Emerging Organizational Synthesis in Modern American History," *Business History Rev.*, vol. 44, no. 3, 1970, pp. 279–290.
49. Watson and Petre, *Father, Son & Co*, pp. 234–238. Watson mentions having early, private outrage over McCarthy, expressed initially in small groups and later in a public address. Internal chronology suggests that this took place after McCarthy was humiliated during televised hearings with the famous question "Have you no sense of decency?" and after journalist Edward R. Murrow denounced McCarthy on television. Watson himself suggests that, while "many prominent people" had already criticized McCarthy, his remarks retained the power to shock the conservative business audience in Indiana to which he delivered them.
50. According to Pugh, IBM's official decision to proceed with the IBM 701 stemmed from Watson Sr.'s suggestion that IBM create a new division to provide specialized defense products on the outbreak of the Korean war. Pugh, *Building IBM*, pp. 167–172.
51. H.R. Keith, "Letter to R E Clement, October 27, 1952," Cuthbert C. Hurd Papers, CBI 95, Charles Babbage Inst.
52. This topic is explored with some thoroughness in K. Flamm, *Creating the Computer: Government, Industry, and High Technology*, Brookings Institution, 1988.
53. Pugh, *Building IBM*, p. 161.
54. The story of SAGE is told from a technical perspective in K. Redmond and T. Smith, *From WHIRLWIND to MITRE: The R&D Story of the SAGE Air Defense Computer*, MIT Press, 2000, and from a cultural and political one in P. Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America*, MIT Press, 1996, chapt. 3.
55. Pugh, *Building IBM*, p. 219. The figure should be read carefully, as IBM was paid up front for the AN/FSQ-7s whereas investment in developing and manufacturing machines for its regular product line was recouped via lease payments spread over a number of years. Still, the military revenues were certainly invaluable in underwriting its entry into the computer business, especially given Watson Sr.'s deep aversion to incurring corporate debt.
56. Pugh, *Building IBM*, p. 326.
57. The story appears prominently in most company histories and is well told by Watson himself in Watson and Petre, *Father, Son & Co*.
58. Watson, *A Business and Its Beliefs*, p. 67.
59. D.M. Hart, "Red, White, and 'Big Blue': IBM and the Business-Government Interface in the United States, 1956–2000," *Enterprise and Soc.*, vol. 8, no. 1, 2007, pp. 1–34.
60. In fact, GE ultimately failed in the computer business, and accounts by former members of its computer division invariably single out the firm's repeated installation of managers with no understanding of the computer industry as the primary reason.
61. A.D. Chandler, Jr. *Strategy and Structure: Chapters in the History of the American Industrial Enterprise*, MIT Press, 1962.
62. Allyn, *My Half Century at NCR*, p. 138.
63. A.K. Watson, "Major World Issues," *Ideas for Management: 14th Int'l Systems Meeting*, anonymous, ed., Systems and Procedures Assoc., 1961, pp. 1–3.
64. On the end of Dick Watson's career, see Tedlow, *The Watson Dynasty*, pp. 230–258.
65. Foy, *The IBM World*, pp. 166–167.
66. Foy, *The IBM World*, p. 4.
67. Foy, *The IBM World*, p. 117.
68. Foy, *The IBM World*, p. 187.
69. Norris is profiled in P. Eckstein, "Biographies: William Charles ('Bill') Norris," *IEEE Annals of the History of Computing*, vol. 29, no. 2, 2007, pp. 80–86.



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