From Machine Man to Information Manager:

Class Formation and Group Mobility in Corporate Computing, 1953-1964

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The theme of this conference is “labor and the millennium”. As labor history grapples with the last half of the century, its most pressing problem will be to make sense of the putative "information society" and "new economy". My paper examines the origins of the quintessential worker of the information age: the computer technician. During the mid-1950s American corporations turned in large numbers to electronic computers. In the process they created new spaces – physical, cultural and occupational – whose outlines were not yet defined. The computer proved an extraordinarily powerful emblem of technological modernity, as it brought new prestige and responsibility to the punched card "machine accounting" supervisors to whom it was entrusted. They embraced it as a resource for mobility within the social world of the corporation, from a quasi-blue collar technician status to a quasi-managerial professional status. To do so, they launched an ambitious and ultimately unsuccessful attempt to replicate the professional structures of accountants.

My presentation today uses the idea of “class formation” but is not explicitly theoretical. What I’m trying to do is to borrow some of the perspective used in books like “Chants Democratic” and “Making A New Deal” to gain similar insights into the identities of technical and managerial workers. There are obvious ties in what I’m discussing to the bodies of literature of Taylorism, deskilling and female office workers but I don’t have time to explore them during the presentation.

The punched card machine was introduced in 188X by Herman Hollerith for the purpose of tabulating the results of the 1890 census. The machines made it easy to count large bodies of data aggregated in different ways. Today the punch card machine is best remembered as a direct technical precursor of the electronic computer, but at that time this glorious destiny was as yet unmanifest. During the first decades of the twentieth century it spread slowly through the corporations of America, moving from an initial beachhead in insurance firms into utilities and eventually banks. In 1930 it was still quite obscure. It is mentioned only briefly in the office management textbooks of the period, and its operators accounted for just 3% of the female office workers even in the firms that used it. Its capabilities slowly evolved, as new models gained printing abilities, electric motors, multiplication, the encoding of letters as well as numbers and so on. IBM, the main producer of the machines, experienced a breakthrough in 1935 when the punch card became the administrative centerpiece of the new social security system.

[picture of a punch card installation]

As the machines were used for more and more accounting applications, such as billing, payroll and inventory control they were rechristened “Accounting Machines”. At the dawn of the 1950s, staff of punch card machine departments in Chicago came together to from the Machine Accountants Association. It defined its membership as “those directly connected with the operation and supervision of punched card accounting machines in a supervisory capacity.” As such they were really technicians rather than professional accountants - the choice of name was a statement of aspiration.

The association excluded the lowest level of punch card machine operators – those who punched data onto cards, carried decks of cards between machines and so on.

These jobs were likely to be carried out by women, and were clearly clerical rather than professional – not something the aspiring "machine accountants" wanted to be associated with. But the culture of the "tab room" was a surprisingly traditional and craft-based. Colleges and vocational schools offered very few courses in punched card techniques. Few punch card staff had college degrees, and few trained accountants paid much attention to the technical operation of the machines. Staff generally started with routine jobs configuring machines for new jobs according to written instructions. This was done by adjusting wires on a "plug board" – unlike computers, these punch card machines did not hold a program. An interesting point is that the overall program was not INSIDE any given machine but in the processes and operations of all the machines and their human operators taken together. These procedures were often not written down.

As punch card workers learned more they were trusted with more complex tasks, and gradually moved toward the design of new procedures and wiring schemes to produce additional reports or tackle new jobs. Supervisors and managers had worked their way up through the ranks and maintained a close connection with their machines. For example, in his unpublished memoir "From Punched Cards to Personal Computers", John J. McCaffrey recalls starting work in 1942 a timekeeper in the Wright Aeronautical firm of Cincinnati. Punched cards were used to record the hours worked by each employee. After his promotion to senior timekeeper, he was charged with taking these cards to be processed. From these humble beginnings followed a career in punch card processing, early involvement in the National Machine Accountants Association and, in 1956, work as an early computer programmer. Like (almost) all of his fellows he was white, male and not particularly well educated.

[Picture – changing nature of tabulating machine]

These men toiled far down the organizational ladder, little noticed by executives. Their group might find itself reporting to a head of accounting methods, who would report in turn to a head of accounting. The head of accounting was responsible to the controller – an executive with overall responsibility for accounting and the administrative aspects of corporate finance such as budgets.

[Picture of the first issue of The Hopper]

In the first issue of their newsletter, "The Hopper", they laid out a self-conscious program to achieve greater professional status. Their claim to be "machine accountants" is a fascinating one. Their primary relationship was unquestionably to their machines, like that of a machinist to his lathe. Their newsletter took its very name from the hopper in which punch cards were stacked. And indeed, "machine accountant" is an unimaginative reversal of the phrase "accounting machine". But in the corporate atmosphere of the 1950s they saw the corporate professionalism of accountants as their best hope of group mobility. Accountants themselves had risen from the lowly status of bookkeepers to ever greater organizational power as controllers, auditors and certified professionals.

The leaders of the Machine Accountants Association conceived professionalism in the most prosaic terms imaginable – a series of procedures by which they could join the higher status groups all around them. "Why Be Different? Look around your company and you will find that the Credit Manager, Traffic Manager and practically all department heads belong to associations designed to further them in their professions….

Certainly, as a forward looking Machine Accountants, you should follow a similar pattern to show that you too are interested in being of greater service to your management."

They did not seek elevation one at a time by abandoning their craft skills and taking on a new identity as a supervisor or junior manager doing a different kind of work. Their goal was to get closer to and ultimately become part of management - not by struggling alone and rising through the ranks but by a process of group mobility, raising the status of their whole occupation. In this they rejected the accommodation between engineers and managers made during the Progressive era and discussed in the work of Noble and Layton. Like craft unions, they sought to advance the autonomy, status and rewards of their members through collective action. What was different was the nature of this action. Their writings, textbooks, conference addresses and newsletter articles show a constant striving to present a common front and reiterate the need to stick together to achieve their goals. Their president, Robert L. Jenal illuminated this when he expressed the hope that "through continuing efforts in this direction all of us in the Machine Accountants Association will soon see the day when we take an ever-increasing part in the thinking and planning of Management." Clearly money was at the back of their minds, but this was rarely made explicit – their goal was more prestige and recognition by their superiors.

The new association tapped into an unmet need. In 1952 it became the core of a new National Machine Accountants Association. The national association grew rapidly and by 1955 it already boasted 7,500 members in 103 chapters. But recognition from management was slower to come. Executives viewed its members as uppity blue-collar technicians, tainted by their association with machinery. In 1958 it invited the

Comptroller of Mutual Life to join its convention in Atlantic City and supply management's viewpoint as a keynote address. He was strikingly blunt about his opinion of the machine accountants, or, as he made a point of calling them the "machine men". The "machine men" are "regarded by management in very much the same way as management regarded factory workers or automobile mechanics". While he conceded that they had removed much of the "blue piping from their white collars" he charged that they relied on an "aura of technical mystery", had little concern with profits and were in love with machinery for its own sake. Their instinct was to "put a lot of unnecessary frosting on a cake which was only half baked to start with." The reaction of his audience is not recorded.

Undaunted, the machine accountants pushed forward with their drive toward accounting-style professionalism. By the early 1960s they had all its trappings in place. They published a textbook, "The Hopper" had been renamed "The Journal of Machine Accounting, Systems and Management" and they had a code of ethics. They produced a mass of education and public relations packets for use by chapters, including public work in high schools and so on. They introduced a new "Certificate in Data Processing", closely modeled on the accountant's CPA examinations and intended to lay out a common core of essential professional knowledge for the field. (The questions in the Certificate in Data Processing covered Computing Concepts, Punched-card Data Processing, Computer Systems Organization, Accounting, Mathematics and Statistics). They even offered a Boy Scouts badge in the topic. These programs were not without their problems. After negotiating a poor contract they lost control of their own journal for five years and launched a long lawsuit against their own past president and the journal's

publisher. The code of ethics was vague, toothless and was never used to discipline anyone. The certification program proved controversial, and its requirement for college education was deferred and eventually removed. No more than about 3% of its target market ever held it.

[Slide of the Univac]

But even as the machine accountants worked, the technological and organizational base of their profession was changing under them. In 1954 the first American computer to perform a routine office job was in action. By the end of the 1950s, almost 2000 had been installed. The vast majority of these were much smaller, cheaper and simpler than the million dollar, floor-filling "giant brains" that grabbed headlines. Most companies made an evolutionary change from mechanical (but electrically powered) punch card machines to small but electronic and programmable computers. These machines could even be hooked up to existing punch card equipment, allowing a gradual transition.

[DPMA leadership picture]

IBM favored this gradual approach as a means of translating its existing lock on the punch card machine market into dominance of the emerging market for corporate computers. It christened its new computers "electronic data processing" (EDP) and lumped them together with the existing punched card machines as "data processing" equipment. In 1962, after several earlier attempts, the leadership of the National Machine Accountants Association succeeded in persuading its membership to adopt a new identity: The Data Processing Management Association.

The installation of a computer was a source of pride for a company during the 1950s. The computer room became a destination for visitors to the plant, complete with plate glass windows and air-conditioning. Pictures of managers standing next to the new machine were printed in local newspapers. The computer served as an emblem of modernity and forward thinking, tapping into the prestige enjoyed by science and technology during that era. As a result, the computer offered both literal and metaphorical visibility to its guardians.

However gradual the transition, the shift to the computer era brought a new one major new task for the machine accountants: programming. Although computers had been in use for several years in university departments, military contractors and corporate research centers these pioneers had only trained a few thousand programmers, few of whom had any urge to switch from these glamorous scientific tasks to the writing of payroll programs. Neither did management fully understand the scale or complexity of the programming task. An abiding concern of the association became the support of its membership in their transformation from punch card staff to computer technicians and programmers.

The shift of identity from “machine accountant” to “data processing” reflected a new and broader push for status within the corporation. “Data Processor” was a broad identity, intended to allow a progression from a junior technician through programming, systems analysis and design work and into the ranks of management itself. The identity and status of the DPMA’s members was thus intricately bound up with a particular technology (the computer) and with the structural evolution of a particular corporate department. Their attention turned to the organization chart as a tangible and constantly

contested diagram of the status of different groups. The Machine Accountants had always spent a great deal of time discussing exactly what the boundaries of their profession were and how it related to adjacent areas of expertise, such as "systems and procedures" experts, accountants and operations research.

They now used the new power of the computer to seek a higher position in the organizational chart. Most data processing departments fell under the auspices of the controller and his accounting operations. The conferences of the Data Processing Management Association were soon alive with presentations calling for the creation of data processing as a "top level function in its own right". In a 1962 presentation, one member called for management to recognize that "We no longer belong to just the Accounting department but to all departments." Like many such papers, this one included an idealized description of the stages through which data processing had already passed and laid out the future steps of its evolution – together with a series of charts showing its inevitable future progression in four stages to attain a rank equal to that of finance or operations.

[Picture of charts]

The machine accountant's struggle to build a new identity for themselves constituted a kind of class formation. Like nineteenth century craft workers, the strengthening of their occupational identity involved a weakening of ties with their particular employer and a strengthening of their relationship to their tools and techniques. Like unionized workers, they sought to raise the status of their occupation as a whole, through collective action. They recognized that the nature and scope of the new data processing department was undefined, and would evolve together with their own standing

as professionals and credible managers. Their efforts were thus tied not to a union but to a corporate function. They talked continually of the need to "educate" senior managers about the true nature and importance of their work, to raise their public profiles and to report directly to a senior manager.

We now understand working class consciousness as an unstable phenomenon that has been built during certain historical eras through a complex process of politics, social transformation and alliances. Workers came to feel part of a broader, overarching proletariat not despite of but through their more local identities of race, gender, geography and skill. During the 1950s and 60s a similar process of **managerial** class formation was at work. Externally produced changes in the work of the machine accountants, through the higher status of the computer, did not in themselves dictate a new identity. They constantly discussed what their role should be, what management is, why they belong there, how to achieve a higher status. The leaders of their association pushed their members to act more managerially, to take seminars on management and to seek professional certification. This often lead to great tension between head office and the chapters – the association's leadership saw itself as a vanguard of managerial professionalism dragging a sometimes unruly rabble of old-school tab technichians.

The DPMA offered one vision of computer professionalism – as a certified, business like professional ready to assume a managerial role. This was not the only vision of computing professionalism being promoted during the period. Another leading association was the Association for Computing Machinery (ACM). Founded in 1947, the ACM was led by academics and organized along the model of a scientific society. It, too, claimed to represent the computing profession but preferred to focus on universal and

theoretical topics such as the theory of programming, rather than the pragmatic and corporate concerns of the DPMA. Merger talks in 1960s and 1970s foundered repeatedly on cultural differences – powerful factions within the DPMA resented the ACM's air of superiority and ridiculed its leadership as "long-hairs". ACM members, in return, condescended to the DPMA as "Electronic Accounting Machine" operators who lacked the intelligence and education to understand their work. "Would you want your sister to marry one?" asked one leading ACM member, poking fun at the attitudes of his less tolerant colleagues. The ACM tried to undermine the DPMA's Certificate in Data Processing as a required credential for programming work. One of its leaders slammed the certificate as suitable only for "the sub-professional worker or technician in computer programming to do the work not requiring the technical competence, experience and responsibility of professionals."

Ironically, the DPMA's vision of professionalism rested on uniting technicians, programmers, business analysts, supervisors and managers as different steps of development in a single profession. In this vision of corporate professionalism, greater professionalism meant an increasing focus on business and a close relationship to executives. But this very practicality seemed tawdry and unprofessional to the ACM with its vision of scientific professionalism focused on theoretically informed programming excellence.

[Picture of SPA]

Within the corporation, the DPMA's data processors contested control of the computer with members of the Systems and Procedures association. The "systems men" as the SPA's members called themselves, had attempted to stake out the higher ground as

corporate staff experts, policing the management of divisions and ensuring the efficient operation of overall corporate systems. They were better educated than the machine accountants, and enjoyed a higher status in the eyes of top management. But although they fancied themselves following in the steps of Robert McNamara and his team of Ford whiz-kids, most were trusted with little more than the design of forms and the definition of clerical procedures.

During the last few years of the 1950s the systems men were split on the question of the computer. As experts in the analysis and formal documentation of administrative procedures, they had an obvious part to play in the automation of these procedures. Some welcomed the computer as a powerful new ally that would bring them authority and command greater attention from top management. In his 1958 keynote address F. Walton Wanner, the SPA's President, argued that the computer "opens doors heretofore not open to systems activities." Others thought such technical details best delegated -- "Is the analyst turning into an artisan making application of punched card and magnetic tape equipment?" asked one. Not being a labor historian, he considered this a bad thing. This comment captures the complex challenge facing would-be technical professionals. The computer was a remarkable resource for professional growth, catapulting the machine accountants into a position of considerable organizational power. On the other hand, dominant managerial culture viewed the “technical” status needed to reap these benefits with considerable disdain.

Membership of the DPMA peaked at around 30,000 during the late 1960s. Its numbers remained stagnant during the 1970s and 80s, even as corporate computing boomed around it. Off all the associations involved with computing it was the most active

in its pursuit of the traditional hallmarks of professional status. The interesting thing is that fewer and fewer computer programmers and supervisors felt the need to seek certification or to join a professional society of any kind. The relative success of the ACM and IEEE has been as organizations for computer academics and engineers, rather than rank and file corporate computer people. The enduringly tight labor market and increasing diversity of computer skills and technologies made it impossible ever to agree on a common overarching identity for a "data processor". While corporate computer workers began by earnestly aping the status of better established groups like accountants, their success without the apparatus of certification and examination has made them the paradigm of the "knowledge worker".

Although historians have begun to deal with the social history of corporate managers we have so far done little to separate the divergent interests and identities of the many technical and professional groups that proliferated during the second half of the twentieth century. During this era there is no simple dichotomy of managers and workers. Ideas like "information", "professional" and "technician" held the same importance and power during these upheavals as did ideas like "republicanism" and "artisan" a century before. Just like the American working class, the American managerial class was assembled painstakingly and through a long historical process in which participants privileged certain aspects of their identities and submerged others. Corporate computing staff were torn between their identities as members of a particular firm, an industry sector, a technical profession and a group of artisans defined by set of craft skills such as programming a particular machine. These identities variously reinforced and competed

with their sense of belonging to an overarching managerial class as heterogeneous and fragile as the broad working class consciousness constructed by the labor movement.

[Dilbert cartoon]

Despite the best efforts of the DPMA the status of corporate computer programmers and their supervisors remained ambiguous. The cultures of corporate computing and corporate management are still mutually distrustful. Executives see computer department managers as “narrow tecchies”, while the same managers are seen by programmers they oversee as ignorant “suits”. Yet hope springs eternal that a new breed of manager is about to finally bridge the gulf separating the stubbornly disconnected cultures of the executive suite and the data room. The endurance of such divides suggests that we must look to the structure of corporate society for answers. The dominant culture of business demarcates certain kinds of knowledge as “technical” and certain kinds as “managerial”. This emerges as the main class divide BETWEEN different corporate administrative groups. Systems and computer staff needed to establish technical expertise to win a corporate niche, but their attempts to use technician status as a springboard to managerial authority failed. Unlike financial experts, whose corporate authority rose steadily through the twentieth century, they were unable to win “managerial” status for their arcane techniques.