The Fix is Information, Now What Was The Problem?

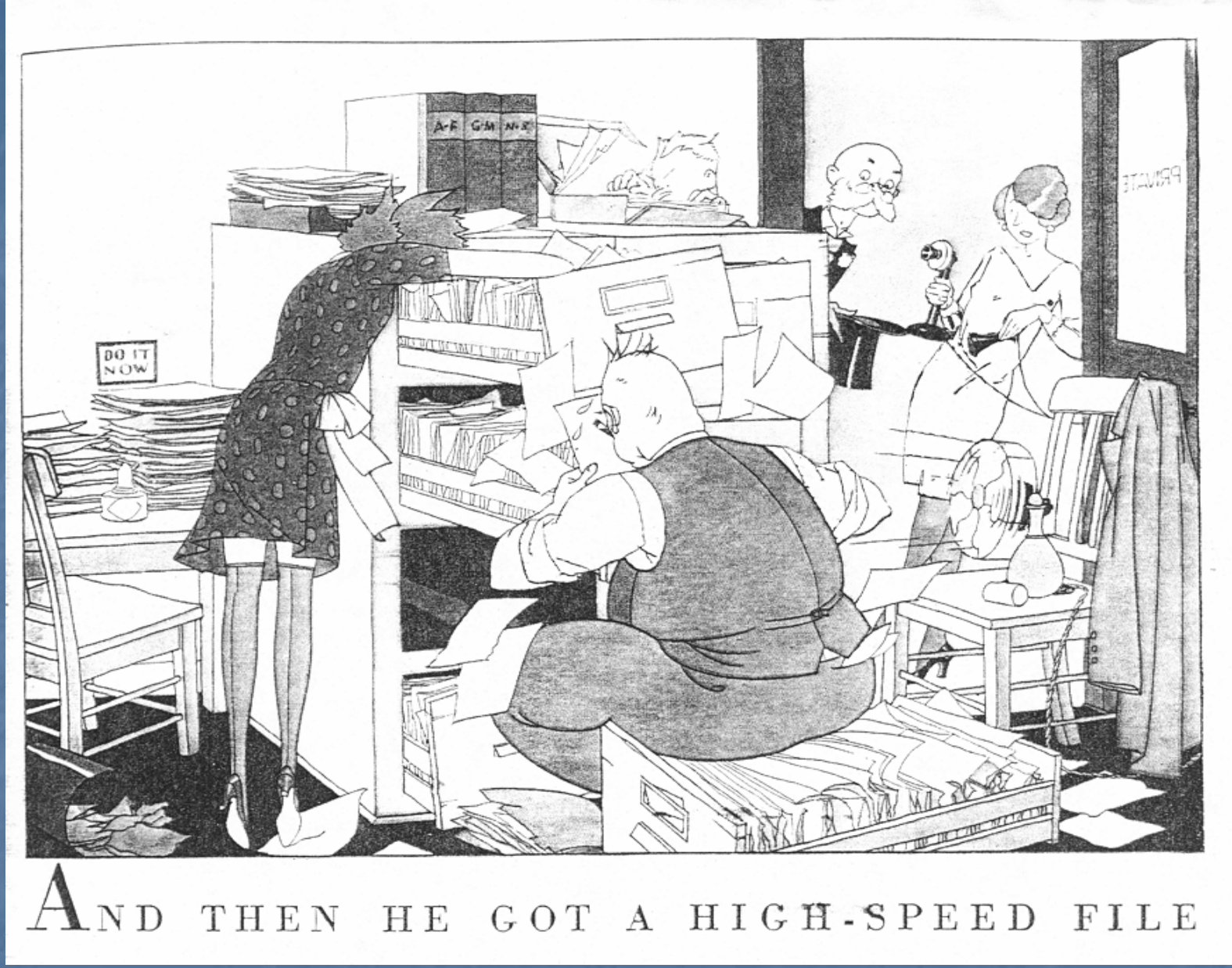
Thomas Haigh

Hagley Conference on the Technological Fix

5th October 2002

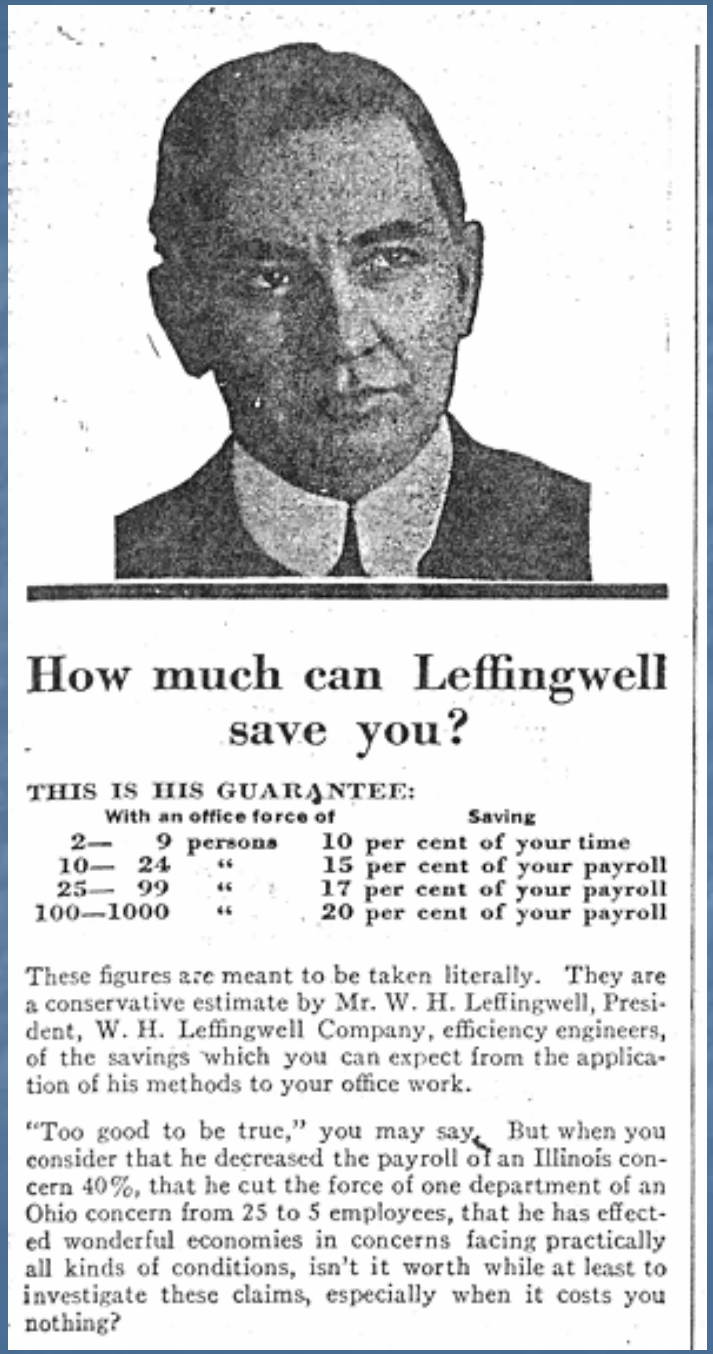
Era I: Office Management & Early Office Technology

1910s and 1920s



AND THEN HE GOT A HIGH-SPEED FILE

Advertisement from System Magazine, mid-1910s



How much can Leffingwell save you?

THIS IS HIS GUARANTEE:

With an office force of		Saving
2— 9	persons	10 per cent of your time
10— 24	"	15 per cent of your payroll
25— 99	"	17 per cent of your payroll
100—1000	"	20 per cent of your payroll

These figures are meant to be taken literally. They are a conservative estimate by Mr. W. H. Leffingwell, President, W. H. Leffingwell Company, efficiency engineers, of the savings which you can expect from the application of his methods to your office work.

"Too good to be true," you may say. But when you consider that he decreased the payroll of an Illinois concern 40%, that he cut the force of one department of an Ohio concern from 25 to 5 employees, that he has effected wonderful economies in concerns facing practically all kinds of conditions, isn't it worth while at least to investigate these claims, especially when it costs you nothing?

- Advertisement for Leffingwell's first book (1917, from System magazine)
- 10-20% savings guaranteed
- Note the appeal to efficiency and cost savings

The Power of File Cards

"… Acme visible records force their owners to use the facts - profit by them, save money by them, stop losses before they get started…. Its successful operation in your business will be automatic…"

(Advertisement for Acme file cards, System magazine 1932)

Leffingwell, from 1925 textbook

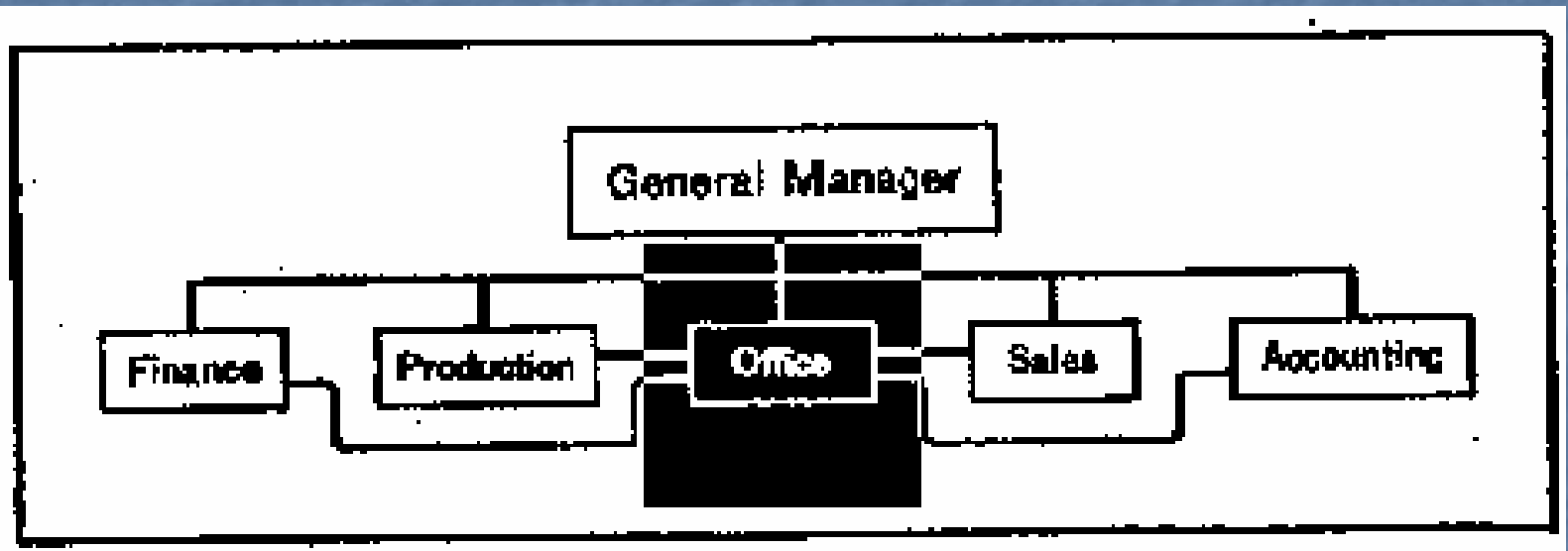


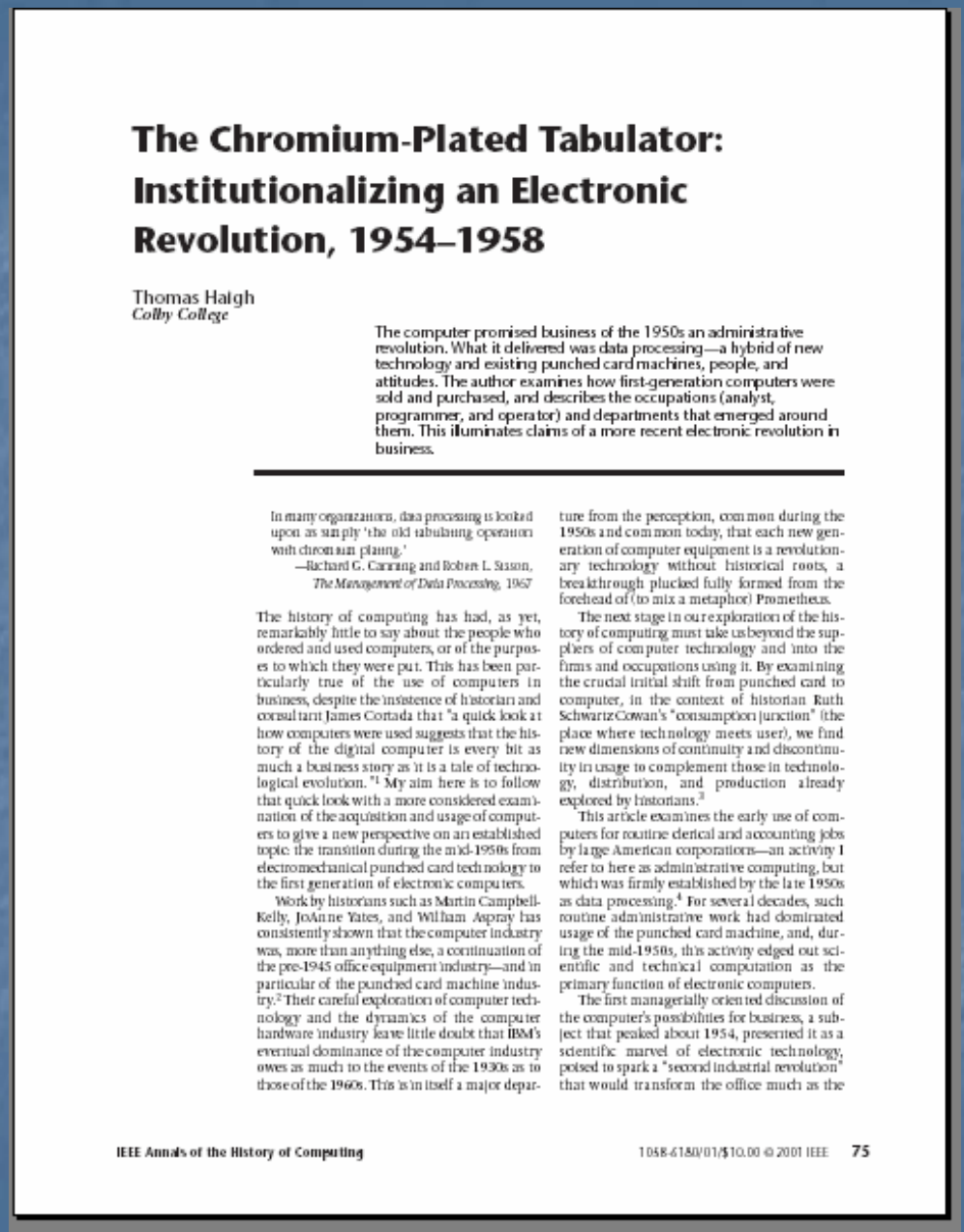
Figure 6: Chart showing relationship of office to other major departments of a business

Systems, Facts – NOT information

Era 2: Management Information Systems and the Computer

Late 1950s & 1960s

The Computer Enters Business



The Chromium-Plated Tabulator: Institutionalizing an Electronic Revolution, 1954–1958

Thomas Haigh
Colby College

The computer promised business of the 1950s an administrative revolution. What it delivered was data processing—a hybrid of new technology and existing punched card machines, people, and attitudes. The author examines how first-generation computers were sold and purchased, and describes the occupations (analyst, programmer, and operator) and departments that emerged around them. This illuminates claims of a more recent electronic revolution in business.

In many organizations, data processing is looked upon as simply 'the old tabulating operation with chromium plating.'
—Richard G. Canning and Robert L. Sisson, *The Management of Data Processing*, 1967

The history of computing has had, as yet, remarkably little to say about the people who ordered and used computers, or of the purposes to which they were put. This has been particularly true of the use of computers in business, despite the insistence of historian and consultant James Cortada that "a quick look at how computers were used suggests that the history of the digital computer is every bit as much a business story as it is a tale of technological evolution."[1] My aim here is to follow that quick look with a more considered examination of the acquisition and usage of computers to give a new perspective on an established topic: the transition during the mid-1950s from electromechanical punched card technology to the first generation of electronic computers.

Work by historians such as Martin Campbell-Kelly, JoAnne Yates, and William Aspray has consistently shown that the computer industry was, more than anything else, a continuation of the pre-1945 office equipment industry—and in particular of the punched card machine industry.[2] Their careful exploration of computer technology and the dynamics of the computer hardware industry leave little doubt that IBM's eventual dominance of the computer industry owes as much to the events of the 1930s as to those of the 1960s. This is in itself a major departure from the perception, common during the 1950s and common today, that each new generation of computer equipment is a revolutionary technology without historical roots, a breakthrough plucked fully formed from the forehead of (to mix a metaphor) Prometheus.

The next stage in our exploration of the history of computing must take us beyond the suppliers of computer technology and into the firms and occupations using it. By examining the crucial initial shift from punched card to computer, in the context of historian Ruth Schwartz Cowan's "consumption junction" (the place where technology meets user), we find new dimensions of continuity and discontinuity in usage to complement those in technology, distribution, and production already explored by historians.[3]

This article examines the early use of computers for routine clerical and accounting jobs by large American corporations—an activity I refer to here as administrative computing, but which was firmly established by the late 1950s as data processing.[4] For several decades, such routine administrative work had dominated usage of the punched card machine, and, during the mid-1950s, this activity edged out scientific and technical computation as the primary function of electronic computers.

The first managerially oriented discussion of the computer's possibilities for business, a subject that peaked about 1954, presented it as a scientific marvel of electronic technology, poised to spark a "second industrial revolution" that would transform the office much as the

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Early corporate computer use as Data Processing

Haigh, Thomas. "The Chromium-Plated Tabulator: Institutionalizing an Electronic Revolution, 1954-1958." *IEEE Annals of the History of Computing* 23, no. 4 (2001): 75-104.

Business History Review

Special Issue: Computers and Communications Networks

(Burroughs Corporation photograph from 1961 courtesy of Charles Babbage Institute, Univ. of Minnesota, Minneapolis.)

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Haigh, Thomas. "Inventing Information Systems: The Systems Men and the Computer, 1950-1968." *Business History Review* 75, no. 1 (2001): 15-61.

Thomas Haigh

Inventing Information Systems: The Systems Men and the Computer, 1950–1968

During the 1960s, many academics, consultants, computer vendors, and journalists promoted the "totally integrated management information system" (MIS) as the destiny of corporate computing and of management itself. This concept evolved out of the frustrated hopes of 1950s corporate "systems men" (represented by the Systems and Procedures Association) to establish themselves as powerful "generalist" staff experts in administrative techniques. By redefining the computer as a managerial "information system," rather than a simple technical extension of punch-card "data processing," the systems men sought to establish jurisdiction over corporate computing and to replace accountants as the primary agents of managerial control. The apparently unlimited power of the computer supported a new conception of information, defined as the exclusive domain of the systems men (assisted by operations research specialists and computer technicians). While MIS proved impossible to construct during the 1960s, both its dream of all-encompassing automated information systems and the resulting association of information with the computer endured into the twenty-first century.

During the late 1950s and early 1960s, a new and exciting concept swept through corporate America: the "totally integrated management information system" (MIS)—a comprehensive computerized system designed to span all administrative and managerial activities.

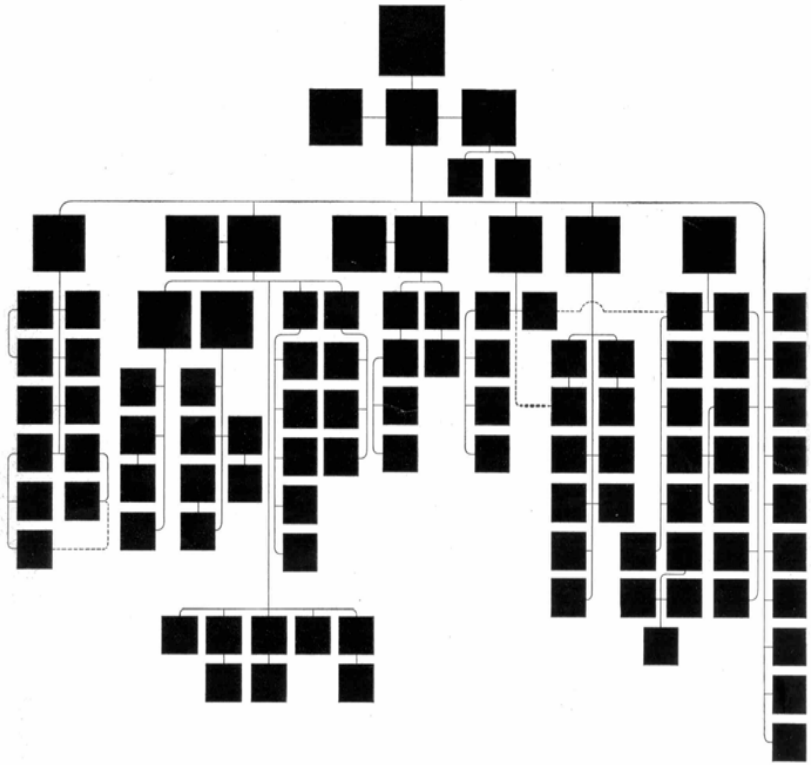
THOMAS HAIGH is a Ph.D. candidate in the History and Sociology of Science Department of the University of Pennsylvania. He would like to thank Richard R. John, Walter Licht, Mauro Guillen, Rosemary Stevens, Walter Friedman, William Aspray, David Mindell, Burt Grad, Robert V. Head, David Hounshell, John Agar, Siegfried Buchhaupt, Helmuth Trischler, Jeremy Vetter, Josh Buhs, Carla Keirns, Jeffrey Tang and Nathan Ensmenger for their comments on earlier versions of this paper. Its preparation has been supported by fellowships from the IEEE History Center, the Charles Babbage Institute and the University of Pennsylvania.

Business History Review 75 (Spring 2001): 15–61. © 2001 by The President and Fellows of Harvard College.

MIS: Facts Speak for Themselves

"When complete information is available, the policy or decision may already have been made. Another way to say this is the facts speak for themselves and require only a formal acceptance and stamp of approval by the line executive rather than a decision."

(McDonough, Adian. "The Scope of Management Systems: Past, Present and Future." In Total Systems, edited by Alan D. Meacham and Van B. Thompson, 20-24. Detroit, MI: American Data Processing, Inc., 1962.)



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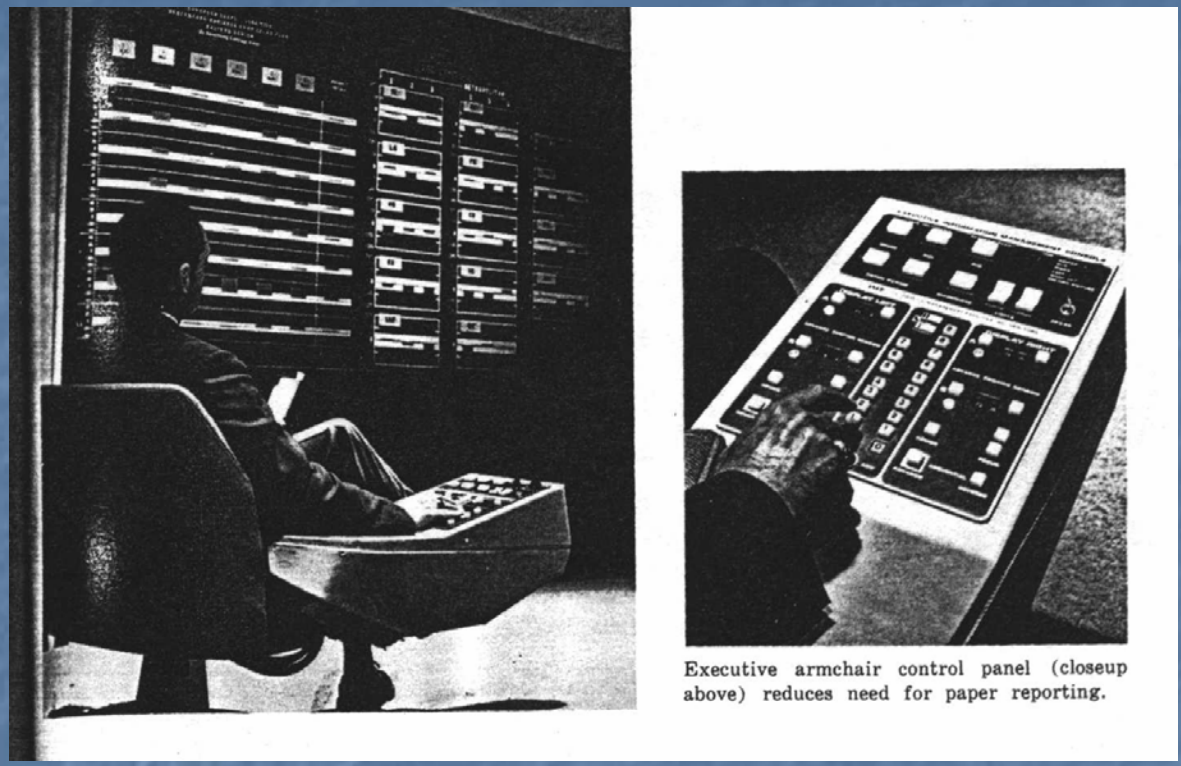
Univac Advertisement, Business Week 1965

Utopian Promises for MIS



Executive armchair control panel (closeup above) reduces need for paper reporting.

"a more relaxed, leisurely management environment. The uneasiness will be replaced by a feeling of confidence in the completeness and timeliness of information and in the decisions based on that information…."

Information Theory Arrives in Business

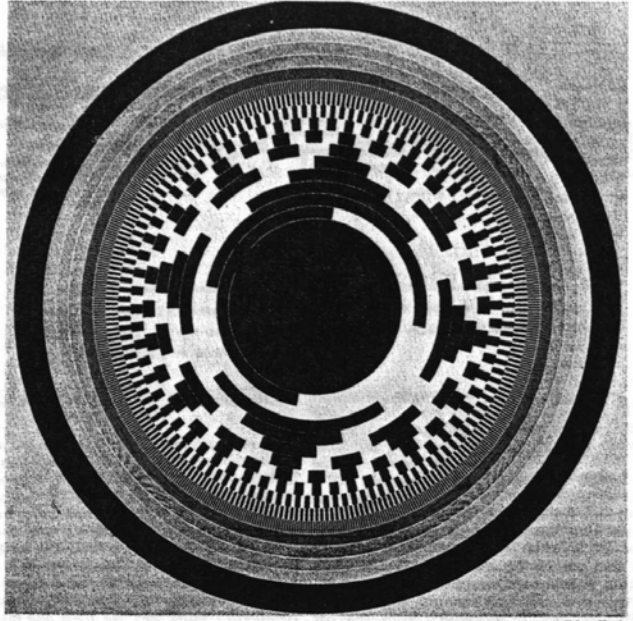


Figure 1. This checkered wheel is at the heart of experimental communication systems of high reliability being studied by the Army Signal Corps. As explained in this article, it converts information into a starkly simple code symbolic of communication's new era.

The Information Theory

by Francis Bello

Great scientific theories, like great symphonies and great novels, are among man's proudest—and rarest—creations. What sets the scientific theory apart from and, in a sense, above the other creations is that it may profoundly and rapidly alter man's view of his world.

In this century man's views, not to say his life, have already been deeply altered by such scientific insights as relativity theory and quantum theory. Within the last five years a new theory has appeared that seems to bear some of the same hallmarks of greatness. The new theory, still almost unknown to the general public, goes under either of two names: communication theory or information theory. Whether or not it will ultimately rank with the enduring great is a question now being resolved in a score of major laboratories here and abroad.

The central teachings of the theory are directed at electrical engineers. It gives them, for the first time, a comprehensive understanding of their trade. It tells them how to measure the commodity they are called upon to transmit—the commodity called "information"—and how to measure the efficiency of their machinery for transmitting it. Thus the theory applies directly to telegraph, telephone, radio, television, and radar systems; to electronic computers and to automatic controls for factories as well as for weapons.

It may be no exaggeration to say that man's progress in peace, and security in war, depend more on fruitful applications of information theory than on physical demonstrations, either in bombs or in power plants, that Einstein's famous equation works. As might be expected, military applications are coming first. For example: The recently disclosed "Distant Early Warning Line" of automatic radar stations, stretching from Alaska to Greenland, almost certainly incorporates more of the lessons of information theory than any other communication system yet devised. The warning line was designed by the two organizations that should know more about the theory than anyone else: Massachusetts Institute of Technology (working through its Lincoln Laboratory) and Bell Telephone Laboratories.

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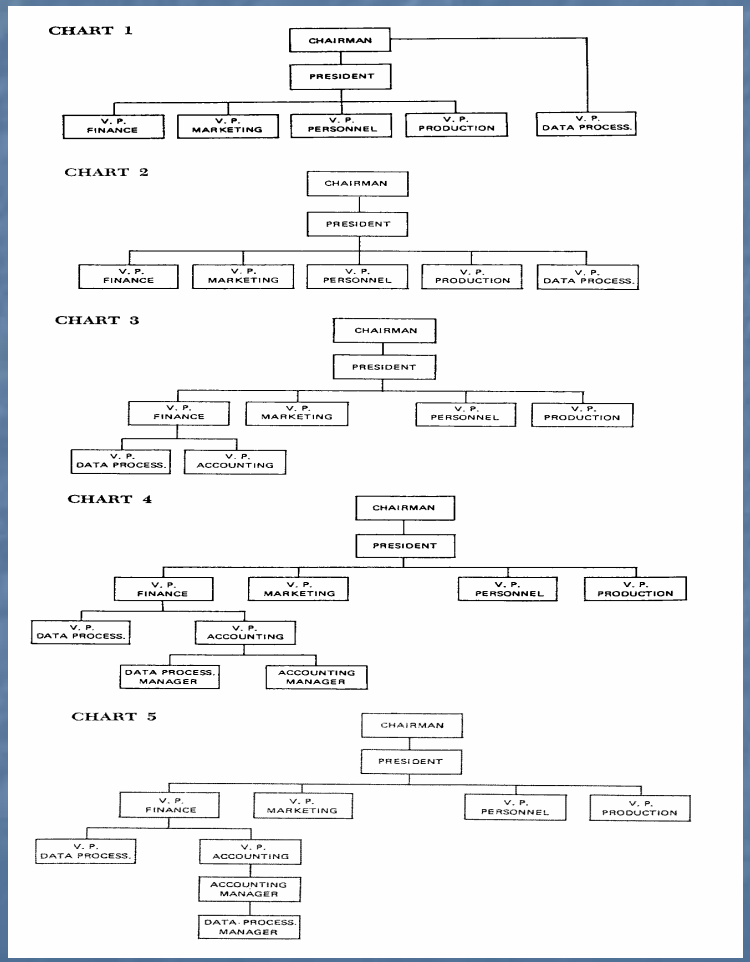
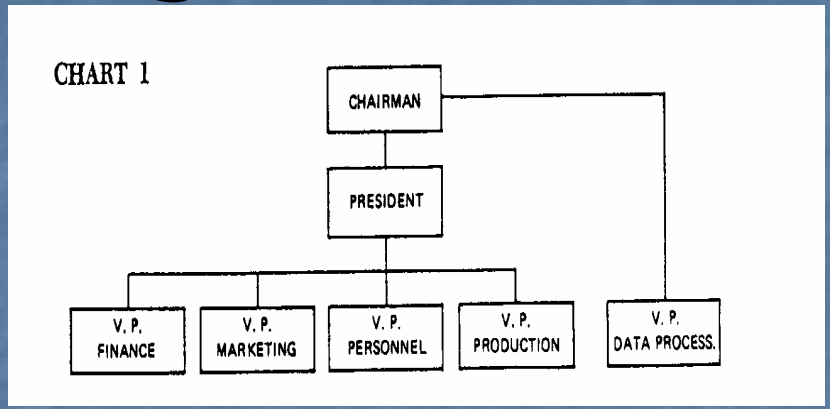
Fortune, 1953

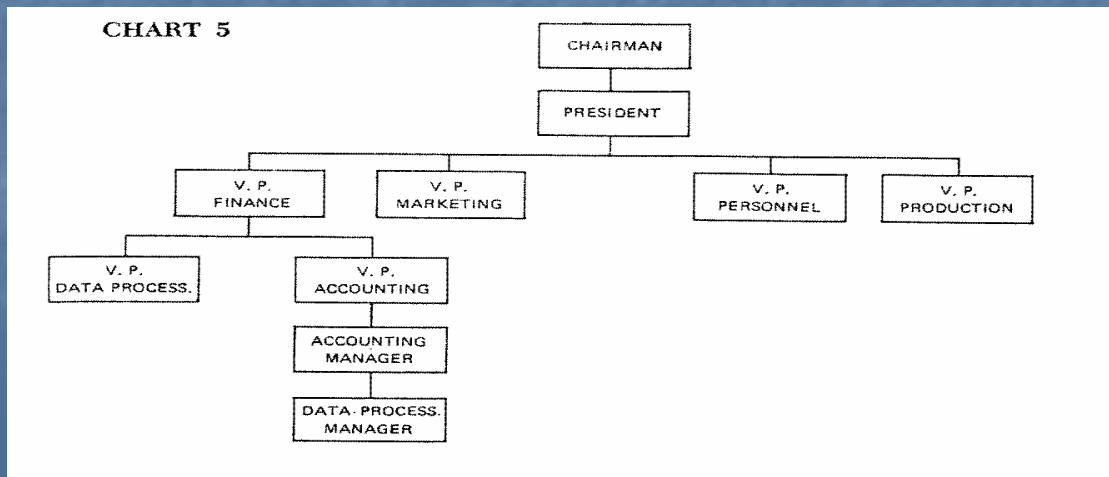
A Manifesto in Org Charts, 1969





Closeups: above is endpoint

Below is startpoint



Era 3: The Chief Information Officer & Personal Computers

1980s – early 1990s

CIO
Buying Power

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