

computers are bad

<https://computer.rip> - me@computer.rip - fax: +1 (505) 926-5492

2024-03-17 wilhelm haller and photocopier accounting

In the 1450s, German inventor Johannes Gutenberg designed the movable-type printing press, the first practical method of mass-duplicating text. After various other projects, he applied his press to the production of the Bible, yielding over one hundred copies of a text that previously had to be laboriously hand-copied.

His Bible was a tremendous cultural success, triggering revolutions not only in printed matter but also in religion. It was not a financial success: Gutenberg had apparently misspent the funds loaned to him for the project. Gutenberg lost a lawsuit and, as a result of the judgment, lost his workshop. He had made printing vastly cheaper, but it remained costly in volume. Sustaining the revolution of the printing press evidently required careful accounting.

For as long as there have been documents, there has been a need to copy. The printing press revolutionized printed matter, but setting up plates was a labor-intensive process, and a large number of copies needed to be produced at once for the process to be feasible. Into the early 20th century, it was not unusual for smaller-quantity business documents to be hand-copied. It wasn't necessarily for lack of duplicating technology; if anything, there were a surprising number of competing methods of duplication. But all of them had considerable downsides, not least among them the cost of treated paper stock and photographic chemicals.

The mimeograph was the star of the era. Mimeograph printing involved preparing a wax master, which would eventually be done by typewriter but was still a frustrating process when you only possessed a printed original. Photographic methods could be used to reproduce anything you could look at, but required expensive equipment and a relatively high skill level. The millennial office's proliferation of paper would not fully develop until the invention of xerography.

Xerography is not a common term today, first because of the general retreat of the Xerox corporation from the market, and second because it specifically identifies an analog process not used by modern photocopiers. In the 1960s, Xerox brought about a revolution in paperwork, though, mass-producing a reprographic machine that was faster, easier, and considerably less expensive to operate than contemporaries like the Photostat. The photocopier was now simple and inexpensive enough that they ventured beyond the print shop, taking root in the hallways and supply rooms of offices around the nation.

They were cheap, but they were costly in volume. Cost per page for the photocopiers of the '60s and '70s could reach \$0.05, approaching \$0.40 in today's currency. The price of photocopies continued to come down, but the ease of photocopiers encouraged quantity. Office workers ran amok, running off 30, 60, even 100 pages of documents to pass around. The operation of photocopiers became a significant item in the budget of American corporations.

The continued proliferation of the photocopier called for careful accounting.



Figure 1: Illustration

Wilhelm Haller was born in Swabia, in Germany. Details of his life, in the English language and seemingly in German as well, are sparse. His Wikipedia biography has the tone of a hagiography; a banner tells us that its neutrality is disputed.

What I can say for sure is that, in the 1960s, Haller found the start of his career as a sales apprentice for Hengstler. Hengstler, by then nearly a hundred years old, had made watches and other fine machinery before settling into the world of industrial clockwork. Among their products were a refined line of mechanical counters, of the same type we use today: hour meters, pulse counters, and volume meters, all driving a set of small wheels printed with the digits 0 through 9. As each wheel rolled from 9 to 0, a peg pushed a lever to advance the next wheel by one digit. They had numerous applications in commercial equipment and Haller must have become quite familiar with them before he moved to New York City, representing Hengstler products to the American market.

Perhaps he worked in an office where photocopier expenses were a complaint. I wish there was more of a story behind his first great invention, but it is quite overshadowed by his later, more abstract work. No source I can find cares to go deeper than to say that, along with Hengstler employee Paul Buser, he founded an American subsidiary of Hengstler called the Hecon Corporation. I can speculate somewhat confidently that Hecon was short for "Hengstler Counter," as Hecon dealt entirely in counters. More specifically, Hecon introduced a new application of the mechanical counter invented by Haller himself: the photocopier key counter.

Xerox photocopiers already included wiring that distributed a "pulse per page" signal, used to advance a counter used for scheduled maintenance. The Hecon key counter was a simple elaboration on this idea: a socket and wiring harness, furnished by Hecon, was installed on the photocopier. An "enable" circuit for the photocopier passed through the socket, and had to be jumpered for the photocopier to function. The socket also provided a pulse per page wire.

Photocopier users, typically each department, were issued a Hecon mechanical counter that fit into the socket. To make photocopies, you had to insert your key counter into the socket to enable the photocopier. The key counter was not resettable, so the accounting department could periodically collect key counters and read the number displayed on them like a utility meter. Thus the name key counter: it was a key to enable the photocopier, and a counter to measure the keyholder's usage.

Key counters were a massive success and proliferated on office photocopiers during the '70s. Xerox, and then their competitors, bought into the system by providing a convenient mounting point and wiring harness connector for the key counter socket. You could find photocopiers that required a Hecon key counter well into the 1990s. Threads on office machine technician forums

about adapting the wiring to modern machines suggest that there were some users into the 2010s.

Hecon would not allow the technology to stagnate. The mechanical key counter was reliable but had to be collected or turned in for the counter to be read. The Hecon KCC, introduced by the mid-1990s, replaced key counters with a microcontroller. Users entered an individual PIN or department number on a keypad mounted to the copier and connected to the key counter socket. The KCC enabled the copier and counted the page pulses, totalizing them into a department account that could be read out later from the keypad or from a computer by serial connection.

Hecon was not only invested in technological change, though. At some point, Hecon became a major component of Hengstler, with more Hengstler management moving to its New Jersey headquarters. "Must have good command of German and English," a 1969 newspaper listing for a secretarial job stated, before advising applicants to call a Mr. Hengstler himself.

By 1976, the "Liberal Benefits" in their job listing had been supplemented by a new feature: "Hecon Corp, the company that pioneered & operates on flexible working hours."

During the late '60s, Wilhelm Haller seems to have returned to Germany and shifted his interests beyond photocopiers to the operations of corporations themselves. Working with German management consultant Christel Kammerer, he designed a system for mechanical recording of employee's working hours.

This was not the invention of the time clock. The history of the time clock is obscure but they were already in use during the 19th century. Haller's system implemented a more specific model of working hours promoted by Kammerer: flexitime (more common in Germany) or flextime (more common in the US).

Flexitime is a simple enough concept and gained considerable popularity in the US during the 1970s and 1980s, making it almost too obvious to "invent" today. A flexitime schedule defines "core hours," such as 11a-3p, during which employees are required to be present in the office. Outside of core hours, employees are free to come and go so long as their working hours total eight each day. Haller's time clock invention was, like the key counter, a totalizing counter: one that recorded not when employees arrived and left, but how many hours they were present each day.

It's unclear if Haller still worked for Hengstler, but he must have had some influence there. Hecon was among the first, perhaps the first, companies to introduce flexitime in the United States.

Photocopier accounting continued apace. Dallas Semiconductor and Sun Microsystems popularized the iButton during the late 1990s, a compact and robust device that could store data and perform cryptographic operations. Hecon followed in the footsteps of the broader stored value industry, introducing the Hecon Quick Key system that used iButtons for user authentication at the photocopier. Copies could even be "prepaid" onto an iButton, ideal for photocopiers with a regular cast of outside users, like those in courthouses and county clerk's offices.

The Quick Key had a distinctive, angular copier controller apparently called the Base 10. It had the aesthetic vibes of a '90s contemporary art museum, all white and geometric, although surviving examples have yellowed to the pallor of dated office equipment.

As the Xerographic process was under development, British Bible scholar Hugh Schonfield spent the 1950s developing his Commonwealth of World Citizens. Part micronation, part NGO, the Commonwealth had a mission of organizing its members throughout many nations into a world community that would uphold the ideals of equality and peace while carrying out humanitarian programs.

Adopting Esperanto as its language, it renamed itself to the Mondcivitan Republic, publishing a provisional constitution and electing a parliament. The Mondcivitan Republic issued passports; some of its members tried to abandon citizenship of their own countries. It was one of several organizations promoting "world citizenship" in the mid-century.

In 1972, Schonfield published a book, *Politics of God*, describing the organization's ideals. Those politics were apparently challenging. While the Mondcivitan Republic operated various humanitarian and charitable programs through the '60s and '70s, it failed to adopt a permanent constitution and by the 1980s had effectively dissolved. Sometime around then, Wilhelm Haller joined the movement and established a new manifestation of the Mondcivitan Republic in Germany. Haller applied to cancel his German citizenship, he would be a citizen of the world.

As a management consultant and social organizer, he founded a series of progressive German organizations. Haller's projects reached their apex in 2004, with the formation of the "International Leadership and Business Society," a direct extension of the Mondcivitan project. That same year, Haller passed away, a victim of thyroid cancer.

A German progressive organization, Lebenshaus Schwäbische Alb eV, published a touching obituary of Haller. Hengstler and Hecon are mentioned only as "a Swabian factory," his work on flextime earns a short paragraph.

In translation:

He was able to celebrate his 69th birthday sitting in a wheelchair with a large group of his family and the circle of friends from the Reconciliation Association and the Life Center. With a weak and barely audible voice, he took part in our discussion about new financing options for the local independent Waldorf school from the purchasing power of the affected parents' homes.

Haller is, to me, a rather curious type of person. He was first an inventor of accounting systems, second a management consultant, and then a social activist motivated by both his Christian religion and belief in precision management. His work with Hengstler/Hecon gave way to support and adoption programs for disadvantaged children, supportive employment programs, and international initiatives born of unique mid-century optimism.

Flexitime, he argued, freed workers to live their lives on their own schedules, while his timekeeping systems maintained an eight-hour workday with German precision. The Hecon key counter, a footnote of his career, perhaps did the same on a smaller scale: duplication was freed from the print shop but protected by complete cost recovery. Later in his career, he would set out to unify the world.

But then, it's hard to know what to make of Haller. Almost everything written about him seems to be the work of a true believer in his religious-managerial vision. I came for a small detail of photocopier history, and left with this strange leader of West German industrial thought, a management consultant who promised to "humanize" the workplace through time recording.

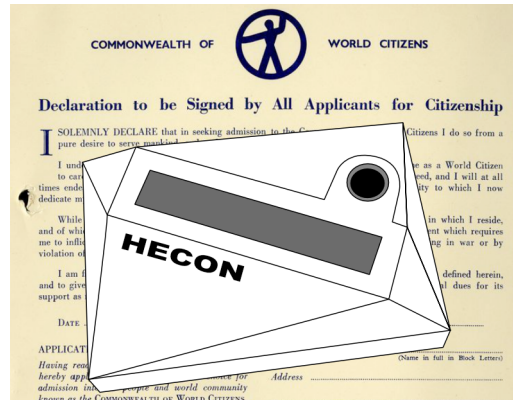


Figure 2: Illustration

For him, a new building in the great "city on a hill" required only two things: careful commercial accounting with the knowledge of our own limited possibilities, and a deep trust in God, who knows how to continue when our own strength has come to an end.