

When Automation Creates New Jobs, Who Gets Them?

Automation can create plenty of new work without creating a path into it. The question that matters is not how many jobs appear. It is who can actually reach them.

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THE ANSWER

In most of the best-measured historical transitions, the new work did not go to the people the automation displaced. Usually it went to somebody else entirely, and the displaced were never fired.

That last part is what makes the pattern hard to see. There is no layoff event, no unemployment spike, no obvious victim. The occupation simply stops taking new people, empties out over fifteen or twenty years, and is gone.

The strongest recurring finding in the record:

Automation often replaces the next cohort before it replaces the current one.

This is a pattern, not a law. It comes from a deliberately narrow set of cases.

These findings apply to historical transitions where both the declining work and the new work can be measured. That requirement skews the evidence toward large, formal, American occupations and toward organized labor, because union records are often the only source that tracks named individuals through a transition. Read what follows as describing those cases rather than automation generally.

THREE QUESTIONS, ROUTINELY TREATED AS ONE

Almost every conversation about automation and employment collapses three separate questions into a single answer.

- Did new work appear?
- Was there enough of it to offset what disappeared?

- Did the displaced workers actually get it?

These resolve independently, and a transition can answer yes to the first two and no to the third. When that happens, the aggregate statistics look excellent and the people who were in the old job are still finished.

The clearest example is also the one most often cited as good news.

The spreadsheet

VisiCalc shipped in 1979. Over the decades that followed, the arithmetic that filled a bookkeeper's day became instantaneous and free.

Bookkeeping and accounting clerk jobs lost since 1980	≈ 400,000
Accounting jobs added over the same period	≈ 600,000
Replacement ratio	≈ 1.5

More jobs created than destroyed. Better-paid jobs, too. This is the case that gets quoted whenever somebody wants to argue that automation works out.

Now look at the boundary between the two columns. A bookkeeping clerk does not become an accountant by learning new software. They become an accountant by completing a bachelor's degree, and for the higher-value work, by passing the CPA exam. That is years of full-time study and real money, undertaken by someone in their forties whose current job is disappearing.

Some made the crossing. The available evidence does not tell us how many.

A replacement ratio above 1 is not evidence that anybody was reabsorbed. It is evidence that jobs exist.

HOW OCCUPATIONS ACTUALLY END

The second finding is more useful than the first, because it is a leading indicator rather than a postmortem.

Telephone operators

In 1920, telephone operators were roughly two percent of the entire American female workforce. AT&T was the largest employer in the country and operators were more than half of its people. Then exchanges began converting to automatic dial switching, city by city, over four decades.

Researchers at Boston University and Harvard reconstructed what happened using complete census records across roughly 3,000 cities, comparing places that converted early against places that converted late. At the moment of conversion, hiring of young operators fell by as much as eighty percent. Incumbents were largely kept on.

≈80%

Collapse in entry-level hiring at the moment a city's exchange converted to dial. Existing operators mostly stayed. National operator employment kept climbing for another two decades.

Read the national headcount in 1935 and you would have concluded the machine had no effect on employment. The effect was entirely in the age distribution, and the age distribution is not something anybody publishes.

The occupation was not emptied. It was sealed, and then it drained.

Newspaper compositors

The same mechanism, produced deliberately, in writing, by people trying to protect workers.

Hot-metal typesetting was a skilled trade with a long apprenticeship. By the early 1970s, computerized composition could do the work, and the New York papers wanted it. In July 1974, after a decade of conflict, the printers' union and the papers reached a settlement: lifetime employment for 1,785 compositors and press operators, in exchange for the right to automate. Members ratified it 1,009 to 41.

The deal held. The Times finished its conversion from hot metal in July 1978, and years later one member covered by that 1974 guarantee was still on the payroll. Nobody was thrown out.

What the union had traded was the apprenticeship. A contemporary account puts the consequence plainly: the agreement choked off the local's ability to bring younger printers into composing rooms. The International Typographical Union, founded in 1852, dissolved at the end of 1986.

Protecting the current workers and preserving the occupation are not the same thing. In this case they were opposites.

This is not an argument about unions. The printers secured a better outcome for their members than most unorganized workforces in the same position achieved. What they could not secure was a next generation, and an occupation with no entrants has a known end date. It is the retirement of its youngest current member.

Longshoremen

A third version, through a different instrument. The 1960 Mechanization and Modernization Agreement on the West Coast gave employers freedom to mechanize and gave the existing workforce a guarantee against layoff. It also divided the workforce into tiers: fully registered A men with dispatch preference and full benefits, partially registered B men, and casuals.

Cargo moved per worker-hour went from 1.5 tons to 37.5 tons. The union's research director could write in 1979 that no one had been laid off, and that was accurate. Registered West Coast longshoremen still fell from 16,002 in 1960 to 14,381 in 1970. On the Atlantic and Gulf coasts the equivalent registration fell from 27,998 to 18,197.

A tiered workforce lets an organization protect incumbents and close the entrance using one instrument, and it leaves no trace in any published series.

WHEN WORKERS DO MOVE

The pattern is not universal, and the exception is instructive.

Bank tellers

Banks installed more than 400,000 ATMs. Tellers needed to run an average urban branch fell from twenty to thirteen between 1988 and 2004. Teller employment did not fall. It rose, from roughly 500,000 to 550,000 across the three decades to 2010, because cheaper branches meant banks opened more of them, and urban branch counts rose forty-three percent.

The important detail for this study is not the headcount. It is that the same individuals kept their jobs while the content changed. Cash handling left. Sales, account service and relationship work filled the space. No teller had to change employer, change occupation, or acquire a credential.

Nobody had to be hired for the transition to happen, so nobody could be hired instead.

In the clearest worker-transition case, the new work stayed inside the existing job, at the existing employer. The further it moved organizationally, the less of it the existing workforce captured.

Drafters

A quieter form of substitution, and a common one. Computer-aided design did reduce the drafter, but not by creating a drafting-adjacent role for drafters to move into. It let engineers and architects do the work themselves. The task moved upstream into people who already held the specification and the degree.

The Bureau of Labor Statistics projects zero employment change for drafters through 2034, with about 16,200 openings a year, all of them from workers leaving the field. That last clause is the closed-entrance pattern, stated in plain language, in a current government projection, for a live occupation.

The task survived. The career path did not.

FIVE QUESTIONS

For assessing an automation transition in your own business, industry, or portfolio.

¹ Are you watching hiring, or only headcount?

If entry into a role has collapsed while incumbents remain, the transition is much further along than the headcount suggests. Look at entry-level openings,

apprenticeship or training intake, and median age. Total employment is the last number to move.

2 **Where will the new work sit?**

Inside the same role and the same company? In a different occupation? At a different employer? Behind a new credential? The further it moves organizationally, the less likely the existing workforce is to capture any of it.

3 **What is the credential distance?**

Ask how long and how expensive it would actually be for a current worker to qualify. Skill adjacency and career accessibility are different measurements. A role can be intellectually next door and practically out of reach.

4 **Is the new work large enough, and what kind is it?**

Separate genuinely new roles, complementary roles that grew, jobs supporting the tool itself, and work that was simply relabeled. Only the first two could plausibly absorb anyone. Counting all four together inflates the number that gets quoted.

5 **Who is entering the new role?**

Age, prior occupation, credentials, hiring source, wage level. If the answer is a different cohort, the automation has created jobs without creating a transition, and those are separate achievements.

WHAT THIS MEANS FOR AI

Most current discussion of AI and employment moves in one step from "new jobs will appear" to "workers will adapt." History treats those as two claims, and the second one fails far more often than the first.

Assume the optimistic case is right and AI generates real categories of work: agent operations, verification and quality assurance, implementation and integration, model supervision, AI compliance and audit, workflow design. Nothing in the historical record says those roles will not exist. Several of them plainly already do.

The question the record insists on is different. Can the people whose current work is being automated realistically enter them, on the timeline they actually have?

Some of the answer is already visible in what these roles require. Verification work demands judgment about a domain plus fluency with the system doing the work. Implementation work sits at a different employer, usually a vendor or a consultancy, not the firm where the displaced job was. Compliance work is heading toward certification. Each of those is an organizational or credential boundary of exactly the kind that often limited movement in the historical cases.

So for an executive or an investor looking at a workforce, an industry, or a company, the forecasting question is not how many jobs are created or destroyed.

It is whether this automation creates a transition path, or whether it creates a new labor market beside the old one.

Those look identical in the employment statistics. They are completely different events for everyone inside them, and only one of them is something a business can manage.

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Drawn from nine measurable historical transitions, 1920 to 2024. Employment figures from the US Bureau of Labor Statistics, the IMF, union registration and contract records, and peer-reviewed research on the mechanization of telephone operation. Spreadsheet figures via public reporting of federal jobs data. Prepress figures are BLS projections rather than realized outcomes.