

Change in the Service Industry, post-WWII - present Final Report

Kallie Hedberg

Undergraduate Major in Environmental Engineering
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139 USA

June 18, 2010

Submitted to Professor Richard C. Larson in support of his work on Services Industries.

Overview

The service industry, as it comprises so much of the current US economy, is defined more by what it isn't than by what it is. For our purposes, we will define the service industry to include any occupation that does not do work that aids in the production of a physical object. This means that every job that is not directly related to agriculture, manufacturing, or resource extraction and harvesting is a service job.

At the top of the service industry's wage distribution we have occupations such as lawyers, doctors, and university professors. At the bottom, we have security guards, cashiers, and waiters. In the middle, we have a number of shrinking occupations, mostly clerical.

Change

The purpose of this research is to identify and analyze the shift and elimination of occupations in the service industry due to two factors: replacement of all or part of a job by technology, and a fundamental change in the consumer-provider relationship that places the burden of service on the consumer (self-service).

Occupations we were asked to consider include elevator operator, gas pump operator, switchboard operator, bank teller, and grocery clerk. Additional occupations under scrutiny include retail clerk (clothing), milk deliverer, and fare collector. The assumption is that while a very many people were employed in these occupations in 1950, today there are comparatively few. This assumption is warranted for several of these occupations, unwarranted for others, and difficult to prove or disprove for most.

Sources of data

Occupational employment data that is detailed enough to include these specific occupations is difficult to come by. The most comprehensive (but by no means consistent or complete) sources of detailed occupational employment statistics come from the US government. Governmental sources are commonly used in literature analyzing occupational change¹.

The US decennial census is the best source of this data. Although the 72-year confidentiality rule prevents the publication of all of the data we are interested in, the census bureau publishes anonymized

¹ Levy and Murnane, *The New Division of Labor* (Princeton: Princeton University Press 2004); Glazer, *Women's Paid and Unpaid Labor* (Philadelphia: Temple University Press 1993); Sheets, Nord, and Phelps, *The Impact of Service Industries on Underemployment in Metropolitan Economies* (Lexington: DC Heath and Company 1987)

'microdata,' 1 in 1000 or 1 in 100 samples of census data, for every census. These microdata have been compiled and scaled-up by sociological researchers, who provide secondary sources of this information.

A particularly useful secondary source for detailed occupational data is the volume *Historical Statistics of the United States*, published by the Cambridge University Press. They provide a table of employment in detailed occupations for 1850 – 1990 at ten year intervals. They claim to have classified occupations according to the 1950 census scheme. Whether this means we can assume that their table's definition of “telephone operator” is what we might today call a “switchboard operator” is open to interpretation. Definitional inconsistencies are a major obstacle to providing accurate historical occupational comparisons.

A source of more recent data (1999 – present) is the National Occupational Employment and Wage Statistics compiled by the Bureau of Labor Statistics based on employer surveys. These data are directly available for our use.

A third source I have investigated is the National Employment Matrix published by the Employment Projections Program of the Department of Labor. This program estimates current employment in detailed occupations and projects employment in those occupations in ten years. These projections will be of interest to us if we decide to look ahead as well as behind for trends indicating change in the service industry.

Data

Data are based on the *Historical Statistics of the United States* (Table 1, 1950-1990), the National Occupational Employment and Wage Statistics (Table 2, 2000-2009), and the Employment Projections Program (Table 3; 2008, 2018). Data for other specified occupations were unavailable.

Clearly, there are several problems with the terms we are using to search for occupational statistics. A well-defined occupation is that of the elevator operator, for which we obtain very convincing data. I find the data for bank teller/teller to be similarly convincing, as the current definition given by the BLS for 'teller' is:

“Receive and pay out money. Keep records of money and negotiable instruments involved in a financial institution's various transactions.”

An occupation whose definition is almost certainly changeable over time is that of the telephone/switchboard operator. The definition for 'switchboard operator, including answering service' given in recent publications by the BLS is

“Operate telephone business systems equipment or switchboards to relay incoming, outgoing, and interoffice calls. May supply information to callers and record messages.”

This is contrasted by the definition for 'telephone operator,' which reads:

“Provide information by accessing alphabetical and geographical directories. Assist customers with special billing requests, such as charges to a third party and credits or refunds for incorrectly dialed numbers or bad connections. May handle emergency calls and assist children or people with physical disabilities to make telephone calls.”

We can only assume that the 1950 definition of telephone operator was limited to the tasks accomplished by a switchboard operator.

	Elevator operator	Telephone operator	Bank teller
1950	91700	380100	66900
1960	75100	354400	131400
1970	36300	410600	251200
1980	20200	358500	495300
1990	10200	224900	489200

Source: *Historical Statistics of the United States: Millennial Edition*, ed. Susan Carter, Scott Sigmund Gartner, Michael Haines, Alan Olmsted, Richard Sutch and Gavin Wright (Cambridge: Cambridge University Press, 2006), <http://hsus.cambridge.org>, accessed June 4, 2010

Table 1

		Switchboard operator, including answering service	Teller
2000	NA	243100	492950
2009	NA	146980	576580

Source: Bureau of Labor Statistics, U.S. Department of Labor, Occupational Employment Statistics, 2000 National Occupational Employment and Wage Estimates [June 4, 2010] [http://www.bls.gov/oes/2000/oes_nat.htm]. May 2009 National Occupational Employment and Wage Estimates [June 4, 2010] [http://www.bls.gov/oes/2009/may/oes_nat.htm]

Table 2

		Switchboard operator, including answering service	Teller
2008	NA	155200	600500
2018	NA	138300	638000

Source: Bureau of Labor Statistics, U.S. Department of Labor, Employment Projections Program, Table 1.2 Employment by occupation, 2008 and projected 2018 [June 15, 2010] [<http://www.bls.gov/emp/#tables>]

Table 3

That we are unable to find data for gas pump operator or milk deliverer is expected, as these definitions are almost certainly too specific and would be classified under broader headings, such as “garage employees” or “delivery truck driver.”

Terms that are too general or too vague include 'grocery clerk' and 'retail clerk (clothing)'. By grocery

clerk, we mean a clerk working on the floor of a grocery store who takes orders from customers and fills them. Such an occupation is unheard of today, but employees of that nature did exist in the era before self-service groceries. However, the term grocery clerk could encompass any number of occupational functions both in the past and the present. By retail clerk we mean a service position that aided customers in choosing garments, helping to fit them, and filling orders in a manner similar to a grocery clerk. Similarly, the term retail clerk can mean many things, then and now.

It is important to note the development of the self-service retail and grocery industries. The first self-service store, a Piggly Wiggly, opened in 1916. In the 1930s, King Kullen, Big Bear, and A&W were all popular self-service stores. By 1964, 98% of all food retailing in the United States was done through self-service.² Thus, there has not been much of a remarkable shift in self-service retail since the 1950's. The potential of fully self-service retail employing RFID and minimal to no staff is discussed below and in the appended articles.

Analysis

Several trends emerge from the body of literature that examines changes in employment and the workplace over the past 60 years. In the service industry, two key practices have led to the 'mechanization' of service work: division of labor and standardization. Division of labor has allowed employers to segment employee responsibilities into increasingly smaller and routinized tasks, creating factory-line-like specialties. Standardization ensures that these tasks are carried out the same way by every employee. Combined, these practices have in the past made it easier for employers to replace one worker with another, and now to replace a specific task or an entire worker with technology.

These shifts have led to enhanced employer control over employees and product. Standardization is applied to each small work process (writing up a legal document, creating a powerpoint presentation) and to the front end consumer experience (online banking, customer service). Coupled to this, division of labor allows simple, routinized tasks to be coded into technology (ATMs, assessing a mortgage application). Along with reengineering, which collapsed many traditional corporate hierarchies, these changes have eliminated many jobs and fundamentally altered the nature of employment. Temporary, contingent, or project-based jobs are now commonplace. Only in 1995 did the Bureau of Labor Statistics begin to document such workers, and by 2001 it estimated that 18 million working Americans (not self-employed) had no ongoing contract with an employer³.

Outlook

Already, whole occupations have been rendered obsolete by technology, including elevator operator, gas pump operator, milk deliverer, and fare collector. Shifts to self-service have eliminated more occupations, including grocery and retail clerk. Of those occupations under consideration, only two remain significant enough to be scrutinized by the Bureau of Labor Statistics. The Occupational Outlook Handbook predicts the demise of the switchboard operator:

“Employment of communications equipment operators is expected to decline rapidly due to new labor-saving communications technologies, such as voice recognition technology and internet directory assistance services. The movement of jobs to foreign countries, proliferation of cell phones, and consolidation of telephone operator jobs into fewer locations also will continue to negatively impact employment growth.”⁴

2 Towsey, *Self-Service Retailing* (London: Iliffe Books Ltd 1964)

3 Greenbaum, *Windows on the Workplace* (New York: Monthly Review Press 2004)

4 Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*, 2010-11 Edition, [June 15,

However, the occupational category of bank teller is supposed to remain viable, though not as a full-time occupation:

“Employment of tellers is expected to grow more slowly than average. To attract customers, banks are opening new branch offices in a variety of locations, such as grocery stores, and keeping their branches open longer during the day and on weekends. Both of these trends are expected to result in some job growth for tellers, particularly those who work part time.”

Both of these occupations are rendered obsolete by a combination of technology (cell phones, ATMs) and a self service shift (internet browsing, online banking).

Other occupations that have declined and continue to decline include that of secretary and telephone operators (service). Between 1994 and 2002, the occupation of secretary lost one million members⁵, and its future growth is predicted to be very slow⁶. AT&T eliminated 140,000 telephone operators between 1950 and the early 1980s⁷, and the occupational employment as a whole is expected to decline rapidly over the next decade⁸. These occupational declines are attributable to collapsing job responsibilities, technology, and internet-based customer support that enables self-service.

Further in the future, we may begin to see staff-free shopping. RFID-enabled shopping has been implemented in test in only a few locations in this country, but according to a report published by the International Labour Office in Geneva⁹, retailers expect it to be commonplace eventually. I have attached several articles detailing the implementation of such stores.

Assessment

An assessment of *why* skills are constantly being redefined to enable technological support or self-service can be found in *The New Division of Labor*¹⁰ by Frank Levy (MIT) and Richard Murnane. They identify five categories of skills that are useful to employers: expert thinking, complex communication, routine cognitive tasks, routine manual tasks, and nonroutine manual tasks. Routine tasks, like distributing money, are easily programmed into computers *and* are done better by computerized systems. However, expert thinking, which allows a scientist to come up with a new methodology, and complex communication, which allows a teacher to engage her class, cannot be programmed. Similarly, non-routine manual tasks, like cooking a meal, are not easily programmed. The occupations we have been studying all require routine cognitive or manual work, and thus, through technology, human work is either eliminated from these occupations altogether, or a small, technologically-mediated work burden is placed upon the consumer.

Levy and Murnane's analysis leads to the conclusion that for those routine middle skill jobs that remain in the market, the higher skills will become increasingly important for hiring and job maintenance. For example, a cashier at a clothing store will need to be equipped with the complex communication skill of persuasion in order to be a valuable employee.

2010] [<http://www.bls.gov/oco/>]

5 *Windows on the Workplace*

6 *Occupational Outlook Handbook*

7 Rifkin, *The End of Work* (New York: Tarcher/Penguin 2004)

8 *Occupational Outlook Handbook*

9 International Labour Office, Sectoral Activities Programme. *Social and labour implications of the increased use of advanced retail technologies*. 2006

10 Levy and Murnane, *The New Division of Labor* (Princeton: Princeton University Press 2004)