



Revising the Standard Occupational Classification system

A new system for classifying occupations was introduced in 1998, reflecting the many changes to the world of work in recent decades, especially the shift towards more services-oriented and high-technology jobs

Chester Levine,
Laurie Salmon,
and
Daniel H. Weinberg

Although occupational data has been collected in the United States since the 1850 Census of Population, the modern Standard Occupational Classification (SOC) system was not introduced until 1977. The SOC is intended to include all occupations for which work is performed for pay or profit. As with any new taxonomy, there were flaws and omissions in the original SOC, and the system was revised in 1980, in time to be used for tabulations from the 1980 decennial census.

Despite plans for frequent review, it was not until the mid-1990s that the validity and usefulness of the 1980 SOC for current needs was examined. To determine how accurately the 1980 SOC reflected the world of work 15 years later, the Office of Management and Budget (OMB) chartered the Standard Occupational Classification Revision Policy Committee (SOC Committee).

This article provides a description of the SOC revision process. For background, it begins with a brief summary of the Standard Industrial Classification (SIC) revision process and the work of the Economic Classification Policy Committee (ECP Committee), much of which was emulated by the SOC Committee. The article then details why the SOC was revised and describes its key characteristics.

The sic revision process

The ECP Committee was established by OMB in 1992 to reexamine the SIC system. At the time, the SIC had been in use for more than 50 years. So pervasive was the system throughout U.S. indus-

try that virtually every business establishment in the Nation knew its SIC code. Yet, many SIC-based statistics were out of step with the changes that have occurred in the U.S. economy in recent decades.

The SIC system had been introduced in the 1930s to help classify the growing number of new manufacturing industries that had developed since the early 1900s. By 1992, however, it was clear that a new classification system was needed to accommodate newly developed industries in such areas as information services, health care services, and high-tech manufacturing. Further, the initiation of the North American Free Trade Agreement in 1994 increased the need for comparable statistics from the United States, Canada, and Mexico.

The resultant system, the North American Industry Classification System (NAICS), is a complete restructuring of the SIC, organized to conform to the principle of grouping establishments by their production processes alone—that is, NAICS is a supply-based or production-oriented classification system. By contrast, the former system used a combination of supply and demand characteristics to classify industries. Another advantage of NAICS is that each participating country can individualize the new system to meet its own needs, as long as data can be aggregated to standard NAICS industries.¹

The SOC Committee identified four key steps in the ECP Committee process that the members thought would be useful to emulate in the SOC revision process: 1) identification of issues (including commissioned issue papers), 2) designa-

See authors' identification on page 42.

tion of an organizing principle, 3) work by subgroups, and 4) adjudication of differences of opinion.

Occupational classification history

Occupational classification is not a new topic of government interest. The published tabulations from the 1850 Census of Population constitute the first de facto classification. There were 322 occupations listed, including such interesting jobs as *daguerrotypists* (photographers) and *salaeratus* (baking soda) *makers*. (See appendix for a complete list of the occupations used in the 1850 Census.) In early classification systems, too much emphasis was placed on the industry in which one worked. While it is true that the work setting can influence the job, it is the hallmark of more recent classification systems that characteristics of the work performed comes first.

More frequent data collection began in 1942 with the monthly labor force survey. The U.S. Employment Service needed occupational statistics for its work and developed a Convertibility List of Occupations with Conversion Tables to serve as a bridge between its statistics and information from the 1940 Census of Population. Continued revisions to the census classification scheme and publication of the third edition of the Department of Labor's *Dictionary of Occupational Titles* in 1965 encouraged the government to begin a thorough reexamination of occupational taxonomy.

Without a standard, initially comparable systems will tend to drift apart, reducing the ability of an analyst to compare similar data collected for different purposes. Occupational data from household surveys, for example, which provide demographic information, could not easily be compared with occupational data from industry-supplied, or establishment-based surveys. Similarly, detailed job descriptions from the *Dictionary of Occupational Titles* could not easily be linked to survey data. The need to devise such a standard in order to link these different systems resulted in the 1977 SOC (revised and reissued in 1980).

Despite agreements to maintain and update the original SOC system, for various reasons—the need to maintain each program's historical continuity, a lack of Federal funding, and the absence of a clear directive to enforce comparability—the original system was not revised after 1980. Consequently, many agencies set up data collection systems with occupational classification schemes that differed from the SOC. Observing this problem, BLS hosted an International Occupational Classification Conference to establish a context for a new SOC revision process.² Many new ideas and approaches were presented that influenced the SOC Committee. Similarly, the Employment and Training Administration's Advisory Panel for the *Dictionary of Occupational Titles* had just completed a review of the dictionary and had recommended substantial changes.³

Persuaded that a reconciliation was in order, OMB subsequently invited all Federal agencies with an occupation classification system to join together to revise the SOC. The SOC Committee included representatives from BLS, the Bureau of the Census, the Employment and Training Administration, the Defense Manpower Data Center, and the Office of Personnel Management. In addition, ex-officio members included the National Science Foundation, the National Occupational Information Coordinating Committee, and OMB. Other Federal agencies, such as the Department of Education, the Department of Health and Human Services, and the Equal Employment Opportunity Commission, participated in several meetings of the SOC Committee as well, or as part of the Federal Consultation Group.

The SOC revision process

OMB chartered the SOC Committee in October 1994. Shortly afterward, the SOC Committee published a notice in the *Federal Register* calling for comments specifically on the following: 1) the uses of occupational data, 2) the purpose and scope of occupational classification, 3) the principles underlying the 1980 SOC, 4) conceptual options for the new SOC, and 5) the SOC revision process.⁴

The SOC Committee's main concern was identifying an organizing principle for the revised SOC, which required careful consideration of the conceptual options. Four options were identified in the notice for public comment. The first, and the basic concept behind the 1980 SOC, was the type of work performed. The second option was to model the new SOC after the International Standard Classification of Occupations in recognition of the increasing internationalization of employment. The third option was to devise a "skills-based system," following the recommendations of the Advisory Panel for the *Dictionary of Occupational Titles*. The fourth option identified, an "economic-based system," echoed the choice of the ECP Committee in their revision of the SIC system.

After the public comment period, the SOC Committee established the following criteria to guide the revision process:

- The new classification system covers all occupations in which work is performed for pay or profit, including work performed in family-operated enterprises by family members who are not directly compensated. It excludes occupations unique to volunteers.
- The new system reflects the current occupational structure of the United States and has sufficient flexibility to assimilate new occupations.
- Occupations are classified on the basis of work performed, and required skills, education, training, or credentials.
- Each occupation is assigned to only one group at the lowest level of the classification.

- Supervisors of professional and technical workers usually have a background similar to the workers they supervise and are therefore classified with the workers they supervise. Likewise, team leaders, lead workers, and supervisors of production workers who spend at least 20 percent of their time performing work similar to the workers they supervise, are classified with the workers they supervise.
- Supervisors of production workers who spend less than 20 percent of their time performing the same work as the workers they supervise are classified separately.
- First-line supervisors/managers are generally found in smaller establishments where they perform both supervisory and management functions, such as accounting, marketing, and personnel work.
- Apprentices and trainees should be classified with the occupations for which they are being trained, while helpers and aides should be classified separately.
- Some data-reporting agencies may collect and report data at a more aggregated level, such as broad occupation, minor group, or major group, when enough detail is not available to classify workers into a detailed occupation.
- If an occupation is not included as a distinct detailed occupation listed in the structure, it should be classified in the appropriate residual occupation. Residual occupations are all other occupations in a major, minor, or broad group that are not classified separately.
- When workers may be classified in more than one occupation, they should be classified in the occupation that requires the highest level of skill. If there is no measurable difference in skill requirements, the worker is included in the occupation in which he or she spends the most time.

The SOC Committee opted for practical approaches to classification rather than for (perhaps more appealing) theoretical approaches. The key classification principle chosen for the new SOC was to continue the previous focus on work performed (with “skills-based considerations”). In the SOC Committee’s judgment, the ability to identify and measure skills consistently had not advanced far enough.⁵ The International Standard Classification of Occupations was not used because it was not flexible enough for U.S. needs.⁶ Finally, the SOC Committee believed that an economic-based approach would not provide sufficient practical guidance to employers or employees.⁷

The SOC Committee also solicited public participation in the next part of the process, building the revised SOC. To develop the new system of occupations, the Committee formed six work groups—five of which were based on skills groupings of Occupational Employment Statistics (OES) occupations and one of which dealt with military occupations. The OES was used as a starting point partly because doing so would enable some historical comparability and partly because BLS

was leading much of the work group efforts and thus using BLS survey data would speed the revision process. The following six work groups were formed: 1) management, administrative, and clerical; 2) natural science, law, health, education, and arts; 3) sales and service; 4) construction, extraction, agricultural, and transportation; 5) mechanical and production; and 6) military.

The work groups invited experts from many areas to testify and also requested written recommendations using the SOC revision guidelines. Their procedure was to develop a proposed structure plus a title, a definition, and a list of associated job titles. Each proposed occupation was reviewed by the SOC Committee.

Once most of the occupations were defined and accepted, another work group was formed to discuss and recommend a hierarchy, a key characteristic of the 1998 SOC. Developing the hierarchy ultimately proved one of the more challenging aspects of the process. Perhaps more than any other part of the SOC revision, the hierarchy changed most from its preliminary stage to its final structure, as the Committee struggled to make the SOC more transparent to its users.

In July 1997, the SOC Committee published the proposed new structure. After considering more than 200 comments, a revised structure was submitted to OMB and issued in August 1998.⁸ Subsequently, additional comments were requested by OMB and minor further changes were made.

Purpose: a standardized system

The 1998 SOC was developed in response to a concern that the existing SOC did not meet the need for a universal occupational classification system to which all Federal Government agencies and—it was hoped—other collectors of occupational information would adhere. The following selected government agencies have collected and used occupational data based on unique occupational classification systems that suit their needs.

Bureau of Labor Statistics. The Occupational Employment Statistics (OES) program collects employment data annually on nearly 800 occupations by industry based on establishment surveys of wage and salary workers, who account for about 9 out of 10 workers in the Nation. The OES survey classifies workers according to occupational definitions, a characteristic used for classification in 1998 SOC.

Bureau of the Census. Both the decennial Census of Population and the monthly Current Population Survey (CPS) tabulate data for about 500 occupations for each of the three classes of workers—wage and salary workers, the self-employed, and unpaid family workers. In addition to employment, these programs collect data on a number of demographic characteris-

tics—age, sex, race, and Hispanic origin—as well as a wide range of other characteristics, such as educational attainment, number of hours worked, number of job openings, and employment status. Both the decennial Census of Population and the CPS classify workers according to the job titles given by the survey respondents. Classifying workers according to associated job titles is another characteristic of the 1998 SOC.

Employment and Training Administration. The *Dictionary of Occupational Titles* identified and defined more than 12,000 jobs. This classification system has been replaced by the Occupational Information Network (O*NET), which adheres to the SOC.

Other agencies. The Department of Education collects data on teachers, the Bureau of Health Professions gathers information on health occupations, and the National Science Foundation surveys focus on scientists and engineers. The Office of Personnel Management publishes data on occupations in the Federal Government, and the Department of Defense maintains data on military personnel.

The existence of different occupational data collection systems in the Federal Government presents a major problem—data collected by one program often is not suitable for other uses. Comparisons across programs are limited to the effectiveness and accuracy of crosswalks between different occupational classification systems. For example, data on educational attainment collected through the CPS can only be used with data on employment from the OES program for occupations that are considered comparable from both surveys. Universal adherence to the 1998 SOC will aid analysis of educational, demographic, economic, and other factors that affect employment, wages, and other worker characteristics.

Key characteristics

Structured for comparability. The SOC is composed of four hierarchical levels to enable data collectors to choose a level of detail corresponding to their interests and abilities to collect data on different occupations. The Bureau of Labor Statistics, through its establishment survey that classifies workers according to occupational definitions, is generally able to collect data on more detailed occupations than is the Bureau of the Census, whose household surveys rely almost exclusively on job titles given by respondents to classify workers. The Bureau of Labor Statistics collects data on both heavy and light truck drivers, for example, while the Bureau of the Census cannot differentiate between the two.

The following list shows the 23 major occupational groups of the revised SOC:

- Management occupations
- Business and financial operations occupations
- Computer and mathematical occupations
- Architecture and engineering occupations
- Life, physical, and social science occupations
- Community and social services occupations
- Legal occupations
- Education, training, and library occupations
- Arts, design, entertainment, sports, and media occupations
- Healthcare practitioners and technical occupations
- Healthcare support occupations
- Protective service occupations
- Food preparation and serving related occupations
- Building and grounds cleaning and maintenance occupations
- Personal care and service occupations
- Sales and related occupations
- Office and administrative support occupations
- Farming, fishing, and forestry occupations
- Construction and extraction occupations
- Installation, maintenance, and repair occupations
- Production occupations
- Transportation and material moving occupations
- Military specific occupations

These major groups include 98 minor groups, 452 broad occupations, and 822 detailed occupations.⁹ Occupations with similar skills or work activities are grouped at each of the four levels of hierarchy to facilitate comparisons. For example, the major group, life, physical, and social science occupations, is divided into four minor groups—life scientists, physical scientists, social scientists and related workers, and life, physical, and social science technicians. Life scientists contains broad occupations, such as agriculture and food scientists, as well as biological scientists. The broad occupation, biological scientists, includes detailed occupations such as biochemists and biophysicists as well as microbiologists. The following example shows the hierarchical structure of the 1998 SOC:

19-0000 Life, physical, and social science occupations

(major group)

19-1000 Life scientists (minor group)

19-1020 Biological scientists (broad occupation)

19-1021 Biochemists and biophysicists (detailed occupation)

19-1022 Microbiologists (detailed occupation)

19-1023 Zoologists and wildlife biologists (detailed occupation)

19-1029 Biological scientists, all other (detailed occupation)

Broad occupations often include several detailed occupations that are difficult to distinguish without further informa-

tion. For example, people may report their occupation as biologist or psychologist without identifying a concentration. Broad occupations, such as psychologists, include more detailed occupations, such as industrial-organizational psychologists, for those requiring further detail. For cases in which there is little confusion about the content of a detailed occupation, the broad occupation is the same as the detailed occupation. For example, because it is relatively easy to identify lawyers, the broad occupation, lawyers, is the same as the detailed occupation.

Reflects structure of current workforce. In addition to ensuring comparability among various surveys, the 1998 SOC was designed to mirror the current occupational structure in the Nation, and, in effect, serve as a bridge to occupational classification in the 21st century. The new system should lead to the collection of meaningful data about the workforce and benefit various users of occupational data. These users might include education and training planners; jobseekers, students, and others seeking career guidance; various government programs, including occupational safety and health, welfare-to-work, and equal employment opportunity; and private companies wishing to relocate or set salary scales.

Reflecting advances in factory and office automation and information technology, the shift to a services-oriented economy, and increasing concern for the environment, the new classification structure has more professional, technical, and service occupations and fewer production and administrative support occupations than earlier classification systems. Although the designation “professional” does not exist in the 1998 SOC, the new classification system reflects expanded coverage of occupations classified as professional and technical in earlier classification systems. These occupations have been dispersed among a number of major occupational groups, such as computer and mathematical occupations, community and social services occupations, healthcare practitioners and technical occupations, and legal occupations.

Designers, systems analysts, drafters, counselors, dentists, physicians, artists, and social scientists are among the occupations that are covered in greater detail in the new SOC. For example, the SOC breaks out a number of designer specialties—commercial and industrial, fashion, floral, graphic, interior, and set and exhibit designers. Similarly, the new classification breaks out additional social science specialties—market and survey researchers, sociologists, anthropologists and archeologists, geographers, historians, and political scientists. Examples of new occupations include environmental engineers; environmental engineering technicians; environmental scientists and specialists, including health; environmental science and protection technicians, including health; computer software engineers; multimedia artists and animators; and forensic science technicians; among others.

In the services groups, gaming occupations, such as gaming and sportsbook writers and runners, have been added as a result of growth among these occupations in several States. Other relatively new service occupations include skin care specialists, concierges, massage therapists, and fitness trainers and aerobics instructors.

Production occupations, on the other hand, have undergone significant consolidation. For example, various printing machine operators have been combined into one occupation in the 1998 SOC. Because many factories now employ one person to perform the tasks of setting up and operating machines, both tasks have been combined into one occupation. In addition, many factories now employ teams in which each team member is able to perform all or most of the team assembly activities; these people are included in the occupation, team assemblers. The SOC also includes relatively new production occupations such as semiconductor processors and fiberglass laminators and fabricators.

Office and administrative support occupations—for example, office machine operators—also have been consolidated. Relatively new office and administrative support occupations include customer service representatives and executive secretaries and administrative assistants.

Greater flexibility. To accommodate the needs of different data collection agencies, the SOC enables data collection at more detailed or less detailed levels, while still allowing data comparability at certain levels of the hierarchy. Each occupation in the SOC is assigned a 6-digit code. (The first two digits represent the major group, the third digit represents the minor group, the fourth and fifth digits represent the broad occupation, and the sixth digit represents the detailed occupation.) Data collection agencies wanting more detail to measure additional worker characteristics can split a defined occupation into more detailed occupations by adding a decimal point and more digits to the SOC code. For example, secondary school teachers (25-3031) is a detailed occupation. Agencies collecting more detailed information on teachers by subject matter might use 25-3031.1 for secondary school science teachers or 25-3031.12 for secondary school biology teachers. Additional levels of detail also may be used to distinguish workers who have different training, demographic characteristics, or years of experience. For users wanting less detail, the SOC Committee suggests combining the 23 major groups into 11 or even 6 groups if needed for tabulation purposes.¹⁰

Comprehensive. The Standard Occupational Classification covers all workers in the United States. In some cases, the worker will not exactly fit into a defined occupation and will be classified in a residual occupation at the most detailed level possible. These residual categories are placed throughout the structure as needed. Like other detailed occupations, residual

Implementation of the 1998 SOC

The final 1998 SOC will be published formally by the Office of Management and Budget. All Federal Government agencies that collect occupational data are expected to adopt the 1998 SOC over the next few years. The following implementation schedule will be used by the Bureau of Labor Statistics and the Bureau of the Census—the agencies with the most comprehensive occupational data collection systems.

Bureau of Labor Statistics. The annual Occupational Employment Statistics survey will first reflect the 1998 SOC in 1999; national, state, and metropolitan statistical area data are expected to be available in early 2001.

The Bureau's Office of Employment Projections develops new national employment projections every 2 years, reflected in its "industry-occupation matrix." This matrix presents estimates of current and projected employment—covering a 10-year period—by detailed industry and occupation. The occupational staffing pattern, or detailed occupational makeup, of each industry in the matrix reflects Occupational Employment Statistics survey data. The 1998 SOC will first be reflected in the industry-occupation matrix covering the 2002–12 period, which is expected to be released in late 2003.

The Office of Employment Projections also produces the *Occupational Outlook Handbook*, which is among the most widely used career guidance resources in the Nation, and related publications based on the Bureau's biennial employment projections. Occupational definitions and data completely based on the 1998 SOC will be incorporated for the first time in the 2004–05 edition of the *Handbook*, which is expected to be published in early 2004.

Bureau of the Census. Data collected by the 2000 Census of Population will be coded to the 1998 SOC and published in 2002. Data from the Current Population Survey will be based on the new classification for the first time in 2003.

Where to find more information

The complete occupational structure of the 1998 SOC will be contained in BLS report 929, forthcoming.

The final 1998 SOC ultimately will be published in a two-volume manual. Volume I will contain the hierarchical structure, a complete list of occupational titles and their definitions, a description of the SOC revision process, and a section on frequently asked questions. Volume II will contain a list of some 30,000 job titles that are commonly used by individuals and establishments when reporting employment by occupation. The second volume also will include an alphabetical index of all associated titles and industries and will reference them to the occupation in which they are found. Volumes I and II of the 1998 SOC also will be available at the following Internet address:

http://stats.bls.gov/soc/soc_home.htm

O*NET, the Occupational Information Network, adheres to the 1998 SOC. Information on this occupational classification system appears in "Replace with a Database: O*NET Replaces the Dictionary of Occupational Titles," *Occupational Outlook Quarterly* (Bureau of Labor Statistics, Spring 1999). O*NET also may be accessed at the following Internet address:

<http://www.doleta.gov/programs/onet>

The 1998 SOC will be incorporated into the *Occupational Outlook Handbook* and the Bureau of Labor Statistics industry-occupation matrix. Both the *Handbook* and matrix can be accessed at the following Internet address:

<http://stats.bls.gov/emphome.htm>

To facilitate historical comparisons, the Bureau of Labor Statistics will develop a crosswalk showing the relationship between occupations in the 1998 SOC and the 1997 Occupational Employment Statistics survey.

The Bureau of the Census also is developing a crosswalk showing the relationship between the occupations in the 1998 SOC and those of the 1990 and 2000 censuses. The crosswalk will be available at the following (Bureau of the Census) Internet address:

<http://www.census.gov/hhes/www/occupation.html>

occupations may be individually defined so that separate data can be collected. For example, the broad occupation, biological scientists, lists three types of biological scientists explicitly, but this list is not exhaustive. In order to include all workers in the appropriate classification, residual occupations are added for the workers not defined separately. Geneticists, for example, are included in the residual category, all other biological scientists.

Associated job titles. To facilitate consistent classification by data collection agencies across surveys, the 1998 SOC associates some 30,000 job titles with detailed occupations. For example, associated titles will ensure that a podiatric surgeon consistently will be classified as a podiatrist rather than as a surgeon. Because many of these job titles are industry-specific, the industries also are listed for many titles.

Occupational definitions. A universal occupational classification cannot rely on job title alone. To further facilitate consistent classification, each detailed occupation has a definition that uniquely defines the workers that are included. Definitions begin with tasks that all workers in the occupation are expected to perform. The qualifier “may” precedes duties that only some workers perform. Where a definition includes duties also performed by workers in another occupation, cross-references to the occupation are provided. A sample of occupational definitions follows:

(15-1081) *Network systems and data communications analysts:* Analyze, design, test, and evaluate network systems, such as local area networks (LAN), wide area networks (WAN), Internet, intranet, and other data communications systems. Perform network modeling, analysis, and planning. Research and recommend network and data communications hardware and software. Include telecommunications specialists who deal with the interfacing of

computer and communications equipment. May supervise computer programmers.

Illustrative examples: Internet developer; Systems integrator; Webmaster

Military occupations. The new SOC also covers military jobs. Workers in military occupations that are similar to non-military occupations, such as physicians, cooks, or secretaries, are classified with nonmilitary workers. Those in occupations specific to the military, such as infantry, are in a separate group. However, data on all military personnel—whether specific to the military or not—usually will be separate from data on the civilian labor force collected by the Bureau of Labor Statistics, the Bureau of the Census, and other government agencies.

Historical comparability. Comparability with older classification systems is important for analyzing long-term trends in employment and other characteristics of workers. While such comparability was not the primary consideration in development of the 1998 SOC, researchers will retain the ability to make most historical comparisons.

Flexibility for change. The SOC Committee has proposed that a permanent review committee be established to keep the SOC up to date, and OMB currently is considering the proposal. This committee would consider proposals for new occupations, redefine occupations as job duties change, and amend the list of associated job titles accordingly. For example, some associated job titles in the 1998 SOC might become detailed occupations in future versions of the SOC. The next major revision is expected to begin in 2005, in preparation for the 2010 Census of Population. □

Footnotes

AUTHORS' IDENTIFICATION: Chester Levine is a supervisory economist in the Division of Occupational Outlook, Bureau of Labor Statistics, and Chair of the Construction, Extraction, Agricultural, and Transportation Occupations Work Group of the Standard Occupational Classification Revision Policy Committee (SOC Committee). Laurie Salmon is an economist in the Division of Occupational and Administrative Statistics, Bureau of Labor Statistics, and a member of the SOC Committee Secretariat. Daniel H. Weinberg is Chief, Division of Housing and Household Economic Statistics, Bureau of the Census, and Chair of the SOC Committee.

ACKNOWLEDGMENT: The authors thank the members of the SOC Committee for their helpfulness, good humor, and the many insights offered during the revision process; they also thank Thomas Plewes, the former chair of the SOC Committee, for his outstanding leadership; and they especially thank the members of the SOC Committee Secretariat—Brinton Bohling, Paul Hadlock, Michael Hazzard, Raymond Konstant, and Laurie Salmon—for their hard work and commitment to the goal of developing a new SOC system. Finally, the authors thank Carole Ambler, Nancy Gordon, Linda Hardy, Michael McElroy, Michael Pilot, Neal Rosenthal, and Stephanie Shipp for their helpful comments on earlier drafts of this article.

¹ For a recent summary of NAICS, see John B. Murphy, “Introducing the North American Industry Classification System,” *Monthly Labor Review*, July 1998, pp. 43–47.

² For more on the conference, see *Proceedings of the International Occupation Classification Conference*, Report 833 (Bureau of Labor Statistics, September 1993).

³ See *The New DOT: A Database of Occupational Titles for the Twenty-First Century*, final report of the Advisory Panel for the *Dictionary of Occupational Titles* (U.S. Department of Labor, Employment and Training Administration, May 1993).

⁴ See *Federal Register*, February 28, 1995, p. 10998.

⁵ The Bureau of the Census tested the feasibility of data collection to implement a skills-based approach on its 1995 National Content Survey test of questions for the 2000 Census of Population. The SOC Committee also commissioned work by the Joint Program in Survey Methodology on the collectibility of skills information. BLS also developed a prototype job family matrix (modeled on the Canadian system) that classified occupations by skill level. See “Prototype Skills-based Job Family Matrix,” unpublished report (Bureau of Labor Statistics, April 1994).

⁶ An additional drawback of ISCO-88 was its inclusion of “female” occupations; the soc Committee decided not to make any gender-based distinctions in the soc.

⁷ See *Federal Register*, October 5, 1995, p. 52285.

⁸ See *Federal Register*, July 7, 1997, pp. 36338-36409; and August 5, 1998, pp. 41896-41923. OMB received comments on the final report as well and intends to issue the final 1998 soc by the end of 1999. The soc Commit-

tee is currently working on a two-volume soc manual.

⁹ In comparison, the 1980 soc included 22 divisions (comparable to major groups in the 1998 soc), 60 major groups (comparable to minor groups in the 1998 soc), 223 minor groups (comparable to broad occupations in the 1998 soc), and 664 unit groups (comparable to detailed occupations in the 1998 soc).

¹⁰ *Federal Register*, August 5, 1998, pp. 41897-41898

Appendix: Occupational classification used in the 1850 Census of Population

Actors	Carpet makers
Agents	Carters
Agricultural implement makers	Carvers & gilders
Apothecaries & druggists	Cattle dealers
Apprentices	Caulkers
Architects	Cement makers
Armors	Chandlers
Artificial flower makers	Charcoal-burners
Artists	Chemists
Astronomical, mathematical, & nautical instrument makers	Chimney-sweeps
Auctioneers	Chocolate manufacturers
Authors	City, county, & town officers
Bakers	Civil engineers
Bankers	Clerks
Bank & insurance officers	Clergymen
Barbers	Clock makers
Barkeepers	Clothiers
Basket makers	Cloth manufacturers
Bell & brass founders	Coachmakers
Bell hangers & locksmiths	Collectors
Bellows makers	Colliers
Blacking manufacturers	Comb makers
Black & white smiths	Cotton-gin makers
Block & pump makers	Confectioners
Boarding-house keepers	Contractors
Boat builders	Coopers
Boatmen	Coppersmiths
Boiler makers	Cordwainers
Bone-black makers	Cork-cutters
Bookbinders	Cotton manufacturers
Booksellers & stationers	Cutlers
Bottlers	Daguerreotypists
Box makers	Dairymen & milkmen
Brass & composition workers	Dealers
Brewers & distillers	Dentists
Brick makers	Draughtsmen
Bridge & dock builders	Drivers
Brokers	Drovers
Broom makers	Dyers & bleachers
Brush makers	Editors
Builders	Engineers
Butchers	Engravers
Button makers	Enamellers
Cabinet & chair makers	Factory hands
Cadets	Farmers
Calico printers	Farriers
Card manufacturers	Feather dressers
Carpenters	

File cutters
 Fire-engine makers
 Firemen
 Firework makers
 Fishermen
 Flax dressers
 Frame makers
 Fruiterers
 Furriers

 Gardeners & florists
 Gas fitters
 Gas makers
 Gate keepers
 Glass manufacturers
 Glass stainers
 Glovers
 Glue makers
 Gold beaters
 Gold pen makers
 Gold & silver smiths
 Grate makers
 Grindstone & millstone makers
 Grocers
 Gunsmiths

 Hair workers
 Hardware manufacturers
 Hat & cap manufacturers
 Hemp dressers
 Herdsmen, graziers, & rancheros
 Horse dealers
 Hosiers
 Hunter, trappers, & rangers

 Ice dealers
 India-rubber manufacturers
 Ink manufacturers
 Innkeepers
 Iron founders
 Ironmongers
 Iron workers

 Japanners
 Jewellers
 Joiners

 Laborers
 Lace manufacturers
 Lamp makers
 Lapidaries
 Last makers
 Lathe makers
 Lath makers
 Lawyers
 Lead workers
 Lightning-rod makers
 Lime burners
 Linseed oil manufacturers
 Livery-stable keepers
 Looking glass makers
 Lumbermen

Machinists
 Manufacturers not otherwise specified
 Map makers
 Mariners
 Marketmen
 Masons & plasterers
 Mast makers
 Match makers
 Mechanics not otherwise specified
 Merchants
 Millers
 Millwrights
 Miners
 Mineral water manufacturers
 Model makers
 Morocco dressers
 Moulders
 Mould makers
 Muleteers
 Musicians
 Music sellers
 Music teachers
 Mustard makers

 Nail manufacturers
 Needle makers
 Newsmen
 Nursery men

 Occultists
 Oil-cloth manufacturers
 Oil makers
 Opticians
 Organ builders
 Ostlers
 Overseers
 Oystermen

 Packers
 Painters & glaziers
 Paper dealers
 Paperhangers & upholsterers
 Paper manufacturers
 Paper rulers
 Paper stainers
 Patent-leather manufacturers
 Patent-medicine makers
 Pattern makers
 Pavers
 Pawnbrokers
 Pedlers
 Pen makers
 Pencil makers
 Perfumers
 Philosophical instrument makers
 Physicians
 Pianoforte & musical instrument makers
 Pilots
 Pin manufacturers
 Pipe makers
 Plane makers
 Planters

Plaster-figure makers
Platers
Plumbers
Pocket-book manufacturers
Porcelain manufacturers
Porters & carriers
Pot & pearl ash manufacturers
Polishers & finishers
Potters
Powder manufacturers
Printers
Produce & provision dealers
Professors
Publishers

Quarrymen

Rag collectors
Railroad men
Razor makers
Razor-strop makers
Refectory keepers
Refiners
Reporters
Riggers
Roofers & slaters
Rope & cord makers

Saddle & harness makers

Safe makers
Sail makers
Salaeratus makers
Salt makers
Sash & blind makers
Saw makers
Sawyers
Scale makers
Scourers
Screw makers
Sculptors
Servants
Sextons
Shingle makers
Ship carpenters
Shoe binders
Shoe-peg makers
Shot manufacturers
Showmen
Silk manufacturers
Soldiers
Spinners
Spoon manufacturers
Spring makers
Starch manufacturers
Stave makers
Steel manufacturers
Stencillers
Sterotypists
Stevedores
Stone & marble cutters

Storekeepers
Stove makers
Straw workers
Students
Sugar manufacturers
Surgeons
Surgical instrument makers
Surveyors
Suspender makers

Tailors
Tanners & curriers
Teachers
Teamsters
Telegraph operators
Tinsmith
Tobacconists & cigar makers
Tool makers
Toymen
Traders
Trimmers
Trunk makers
Turners
Turpentine makers
Type cutters
Type founders

Umbrella manufacturers
Undertakers
United States & State officers

Varnish makers
Veterinarians
Vinegar makers

Wagon makers
Warpers
Watchmen
Watchmakers
Weavers
Whalebone workers
Wheelwrights
Whip makers
Whitewashers
White lead manufacturers
Whiting manufacturers
Wine makers
Wine & liquor dealers
Window-shade makers
Wire makers
Wire workers
Wood corders
Wood cutters
Wood dealers
Wooden ware manufacturers
Wool combers & carders
Wool dealers
Woolen manufacturers