

Summary of O*NET™ 4.0 Content Model and Database

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Content Model and Database Summary

This report provides an overview of the O*NET™ 4.0 Content Model and Database, along with a table listing summary information for each of the elements in the model.

The Evolution of O*NET

The Occupational Information Network (O*NET) was first conceived of as a conceptual model of information on occupational and worker requirements and attributes. This model was designed to replace the outmoded *Dictionary of Occupational Titles* (U.S. Department of Labor, 1991) and provide information on transferable skills and other occupational requirements to meet the needs of the 21st century workforce. For a detailed description of the development of the Content Model see *An Occupational Information System for the 21st Century: The Development of O*NET* (Peterson, Mumford, Borman, Jeanneret, & Fleishman, 1999).

The original O*NET Content Model was used to develop an occupational database containing analyst ratings of importance, level, and frequency (where appropriate) for each of the elements in the model. The first O*NET database, named O*NET 98, contained analyst ratings for O*NET Occupational Units (OU's) based on the 1996 Occupational Employment Statistics (OES) program classification system. Both the O*NET and OES programs have now migrated to the 2000 Standard Occupational Classification (SOC) system (Executive Office of the President, Office of Management and Budget, 2000). The change in classification systems led to the release of the O*NET 3.0 Database¹ in July 2000 and a web-based accessing mechanism—O*NET OnLine (<http://online.onetcenter.org>). The new O*NET-SOC classification is compatible with the SOC, while providing additional breakouts of selected SOC detailed occupations. For more information on the O*NET-SOC system see *Transitioning of O*NET to the Standard Occupational Classification* (Levine, Nottingham, Paige, & Lewis, 2000) and *O*NET Occupational Listings: Database 3.1—Introduction* (Lewis, Russos, & Frugoli, 2001).

New Data Collection Phase

In April 2001, the Office of Management and Budget authorized the new O*NET data collection effort. Four different O*NET survey questionnaires—Skills, Knowledge, Generalized Work Activities, and Work Context—will be sent to job incumbents at a variety of business work sites. These incumbent workers will be asked to provide ratings for the O*NET elements based on their own work experience in specific occupations. To facilitate timely and complete responses from incumbent workers, the survey instruments underwent significant improvements, including: 1) a reduction in the reading level and cognitive burden required to complete the surveys, and 2) elimination of items and response scales with poor conceptual and empirical support. The changes to the survey will lead to the development of a database that is more accurate and that is more friendly to end-users. For a detailed discussion of the survey review process, see *Revision of O*NET Data Collection Instruments* (Hubbard, et al., 2000).

Data collected from incumbent workers in O*NET's first collection cycle will be available in 2003. Elements in the Abilities domain will be rated by job analysts based on the information collected from

¹ For a description of the database layout, see the *O*NET 3.1 Data Dictionary* (National Center for O*NET Development, 2001).

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incumbent workers; these data will also be available for the 2003 update.

In order to provide developers with a database structure compatible with the new incumbent worker data prior to 2003, a new database—O*NET 4.0—was created by converting the existing O*NET 3.1 job analyst-based database into the new format. The conversion included:

Updating element names and descriptions. For example, the generalized work activity, “Getting Information Needed to Do the Job,” has been shortened to “Getting Information.” For a detailed list of updated element names and descriptions, see *Revision of O*NET Data Collection Instruments* (Hubbard, et al., 2000).

Rolling-up (i.e., combining) elements into new elements. For example, data from the skill item “Testing” and data from the skill item “Product Inspection” were combined or rolled up into data for a new skill item “Quality Control Analysis.” For a detailed discussion of rolling-up of items, see *Combining Original “Analyst” O*NET Skill Questionnaire Constructs to Form More General Constructs for the Revised Incumbent Questionnaire* (Boese & Lewis, 2001).

Deleting elements and selected response scales. For example, the generalized work activity “Implementing Ideas, Programs, Systems, or Products” and the Level Scale for the Work Style Domain have been deleted. For a detailed list of deleted elements and response scales, see *Revision of O*NET Data Collection Instruments* (Hubbard, et al., 2000).

Converting data elements to reflect a modification in the number of points included within their response scales. For example, many of the scales included within the work context domain were converted from seven-point to five-point scales. For a detailed discussion of the protocol used in the scale conversion, see *Protocol for Matching O*NET Work Context Questionnaire Item Response Scale Values Between the Original “Analyst” Form and the Revised Incumbent Form* (Campbell, 2001).

It is important to note that there are elements included in the incumbent worker data collection for which 3.1 analyst-based data were not generated. Some elements were not suitable for the analyst rating procedure, including a subset of the work context elements and all of the work style elements. In addition, new education and training elements were created after completion of the analyst rating project. For these reasons, there is a small subset of elements in O*NET 4.0 that do not have data, but which will be populated from the incumbent worker data collection.

When new data are available in 2003, the incumbent worker data and new analyst ratings of Abilities will be incorporated into the database, leading to the updated O*NET 5.0 Database with data for all elements (see table 1 for a summary of the total number of elements with data in each of the three versions of the database—3.1, 4.0, and 5.0—). Data collection from incumbent workers will be targeted for specific O*NET-SOC occupations; it is anticipated that O*NET 5.0 will have new data for approximately 150 of the O*NET-SOC occupations.

The presence of incumbent worker data within the O*NET 5.0 Database will lead to the following enhancements over the O*NET 4.0 Database:

1. data on all elements contained within the questionnaires;
2. updated task listings which will also include relevance, importance, and frequency

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- ratings;
3. additional work context, work styles, and education/training data;
 4. fields of meta-data detailing the status of each occupation, such as: a) the availability of data, b) the source of data (e.g., incumbent workers, occupational analysts, subject matter experts), c) the most recent date the occupation's data was updated, and d) the source of the occupation's code (i.e., SOC, O*NET, or OCR); and
 5. an updated data dictionary.

Table 1
Summary of the Number of Elements with Data

Database Version	Number of Elements with Data	Notes
3.1	269	Occupation specific task list counted as one element
4.0	236	269 elements - 24 deleted - 15 rolled-up + 4 new skills + 2 new work context <hr/> 236 total elements
5.0	276	236 elements + 16 work styles + 5 education/training + 19 work context <hr/> 276 total elements

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*Appendix B - O*NET 4.0 Content Model and Database Summary*, lists all of the elements in the O*NET Content Model and indicates in which database version—3.1, 4.0, or 5.0— ratings for these items will be available. The columns of the table provide the following information for each item within the O*NET Content Model (a detailed key for this table is also included in *Appendix A*):

1. element name,
2. element description,
3. status within O*NET 4.0 (e.g., rolled-up, deleted, higher level category, linked, not used),
4. element identification number,
5. survey booklet location (survey booklet and item number), and
6. availability of data within O*NET 3.1, O*NET 4.0, and O*NET 5.0.

As described above, some response scales for particular O*NET content domains were eliminated in O*NET 4.0. This included the level response scale for the Work Styles domain and the frequency response scale for the Generalized Work Activities domain. For a complete description of the types of response scales used in collecting data for each content domain and its related elements, see *Revision of O*NET Data Collection Instruments, Appendix B* (Hubbard, et al., 2000).

NOTE: The table in *Appendix B* combines and includes **all** the elements from the Content Models for O*NET 3.1, O*NET 4.0 **and** O*NET 5.0. The "Onet_content_model_reference" file, provided in the downloadable O*NET 3.1 database, contains only the Content Model elements specific to O*NET 3.1 and represents a subset of the table in *Appendix B*. The "Onet_content_model_reference" table in the downloadable O*NET 4.0 database contains those elements existing in the Content Models for O*NET 4.0 **and** O*NET 5.0.

*Appendix C - Elements Without Data Until O*NET 5.0*, lists the 40 elements in O*NET 4.0 for which no data currently exists, but that will exist in O*NET 5.0. For more information about the "Onet_content_model_reference", see the data dictionaries that accompany the database downloads.

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