System Design Document

(High Level)

Web-based User Interface Design

for

The NIOSH Industry and Occupation Computerized Coding System

Version 1.4 ***(Abbreviated)***

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Revision History

Name	Date	Reason For Changes	Version
Nowlin	2/18/2010	Modified based on project team comments.	1.1
Nowlin	3/31/2010	Modified based on project advisory team comments.	1.2
Nowlin	6/30/2010	Added chapters 7 and 9 to improve clarity; modified I&O coding & support topic page layout and NIOCCS home page based on recommendations made by NIOSH /EID web team.	1.3
Nowlin	12/22/2010	*Final edits after development began.*	1.4
Nowlin	1/11/2011	Created abbreviated version of design doc for distribution at meetings and to post on the internet.	1.4 Abbreviated

1. Introduction

In June 2008, the National Institute for Occupational Safety and Health (NIOSH) approved a project to develop a new industry and occupation (I&O) computerized coding system that would reduce the high cost of manually coding I&O information found on worker records. Funded through the NIOSH National Occupational Research Agenda (NORA), the project began in October 2008. The first phase of the project, System Analysis, was completed in May 2009 producing the System Analysis and Software Requirements document. We are currently in the second phase of the project, System Design, in which we are using the functional and non-functional system requirements gathered during the system analysis to produce a detailed system design, or blue print, for the proposed system.

All system-related documents are developed by the NIOSH project team and reviewed by the project advisory team and other internal NIOSH stakeholders. The project advisory team was established in November 2008 and consists of internal and external stakeholders responsible for reviewing all project outputs in order to provide feedback to the system developers on the needs, priorities, and functionality of the system. The system to be developed is referred to in project documents as the ***NIOSH Industry and Occupational Computerized Coding System (NIOCCS)***.

1.1 Background

- 1998 NIOSH released the Standardized Occupation and Industry Coding (SOIC) system
  - Codes I&O text to the Census 1990 classification scheme
  - Still used by several state vital statistics and health departments

- 2002 NIOSH developed an upgraded version of the SOIC
  - Lack of available funding at the time prevented completion of this upgrade

- 2006 NIOSH analyzed the feasibility of developing a new I&O computerized coding system using latest technologies

- 2008 NIOCCS Project was approved
  - Expected timeframe : Oct 2008 – Sept 2012

1.2 Project Goal

The overall goal of this project is to develop a computer system that will efficiently, accurately, and uniformly translate industry and occupation (I&O) narratives found on employment and health records to standardized I&O codes.

1.3 Purpose

The purpose of this High Level (*abbreviated)* NIOCCS System Design document is to provide a shortened version of the full detailed user interface design to facilitate sharing of information about the system at meetings and conferences with interested parties. To obtain a copy of the full NIOCCS System Design Document, contact Susan Nowlin (snowlin@cdc.gov) or John Lu (jlu@cdc.gov).

1.4 Disclaimer

The findings and conclusions in this presentation have not been formally disseminated by the National Institute for Occupational Safety and Health and should not be construed to represent any agency determination or policy.

1.5 References

1. NIOSH [May, 2009] System Analysis and Software Requirements Specification for The NIOSH Industry and Occupation Computerized Coding System, Version 1.3
2. NIOSH [2008] Industry and Occupation Computerized Coding System NORA Proposal
3. NIOSH [2008] I&O Autocoding Feasibility Report
4. CDC / NCHS [2003] Instruction Manual Part 19, Industry and Occupation Coding for Death Certificates, 2003
5. Census Industry and Occupation Overview web site, http://www.census.gov/hhes/www/ioindex/overview.html, Accessed November 2009

1.6 Acknowledgements

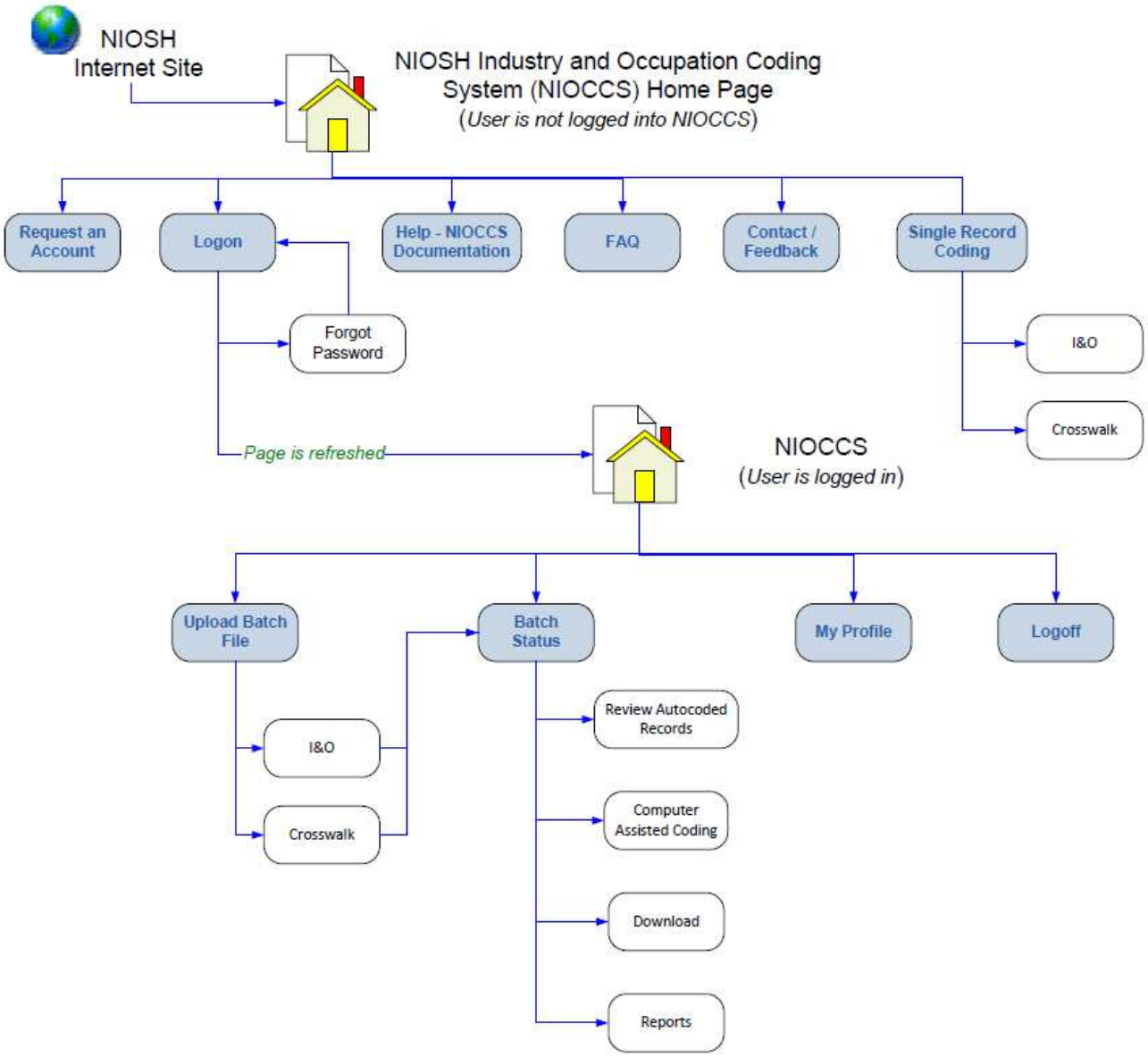
NIOCCS Project Team members:

NIOSH:	John Lu, Suzanne Marsh, Susan Nowlin, Pam Schumacher, Girija Syamlal, James Walker, BJ Haussler
SRA International:	George Guo, Yuping Han, Jeff Purdin
CDC:	Norma McKee
Univ. of Cincinnati:	Ken Berman
BLS:	Dan Gillman

Project Advisory Team members:

BLS:	Kate Newman
Census Bureau:	Rick Downs, Jennifer Day
NAPHSIS	Rose Trasatti
NCHS:	Chrissy Jarman
NIOSH:	John Wood
California:	Susan Payne
Kansas	Greg Crawford
Michigan	Glenn Copeland
New Jersey	Joseph Komosinski
Washington	Philip Freeman

2. User Interface Process Flow - High Level



3. User Classifications

Customer (User) Role

Each user of NIOCCS will have the following functionality when using the web-based version of the software:

a. Upload batches of records to be processed by NIOCCS.
b. Perform Computer-assisted coding of records not automatically coded by NIOCCS.
c. Download batches of records once all coding and quality control have been completed.

To understand how the screens described in this document will function; the following fictitious user scenario will be used for demonstration:

Scenario #1: The ABC University's epidemiology department has an occupational research group that often has a need to code the industry and occupation data found on worker employment and health records to standard I&O codes for analysis. The university has one trained I&O coder named Bob LeCoder. Bob is responsible for all activities regarding the coding, quality control, and management of I&O data for the department. Data is received sporadically by various research projects and is processed as it comes in.

4. System Security

NIOCCS system security will be accomplished through the application of CDC security policies for web-based applications. The development team will work closely with the NIOSH Information System Security Officer (ISSO) to ensure CDC security requirements are followed. Once receiving an authority to operate, the system will be hosted on a secure CDC server.

In addition to CDC application security requirements, the NIOCCS system will incorporate security measures to ensure that users have access only to their own data.

NIOCCS security controls include:

User Accounts
Each user of the system must have a unique user account. The email address of the user requesting an account will be used as the account name.

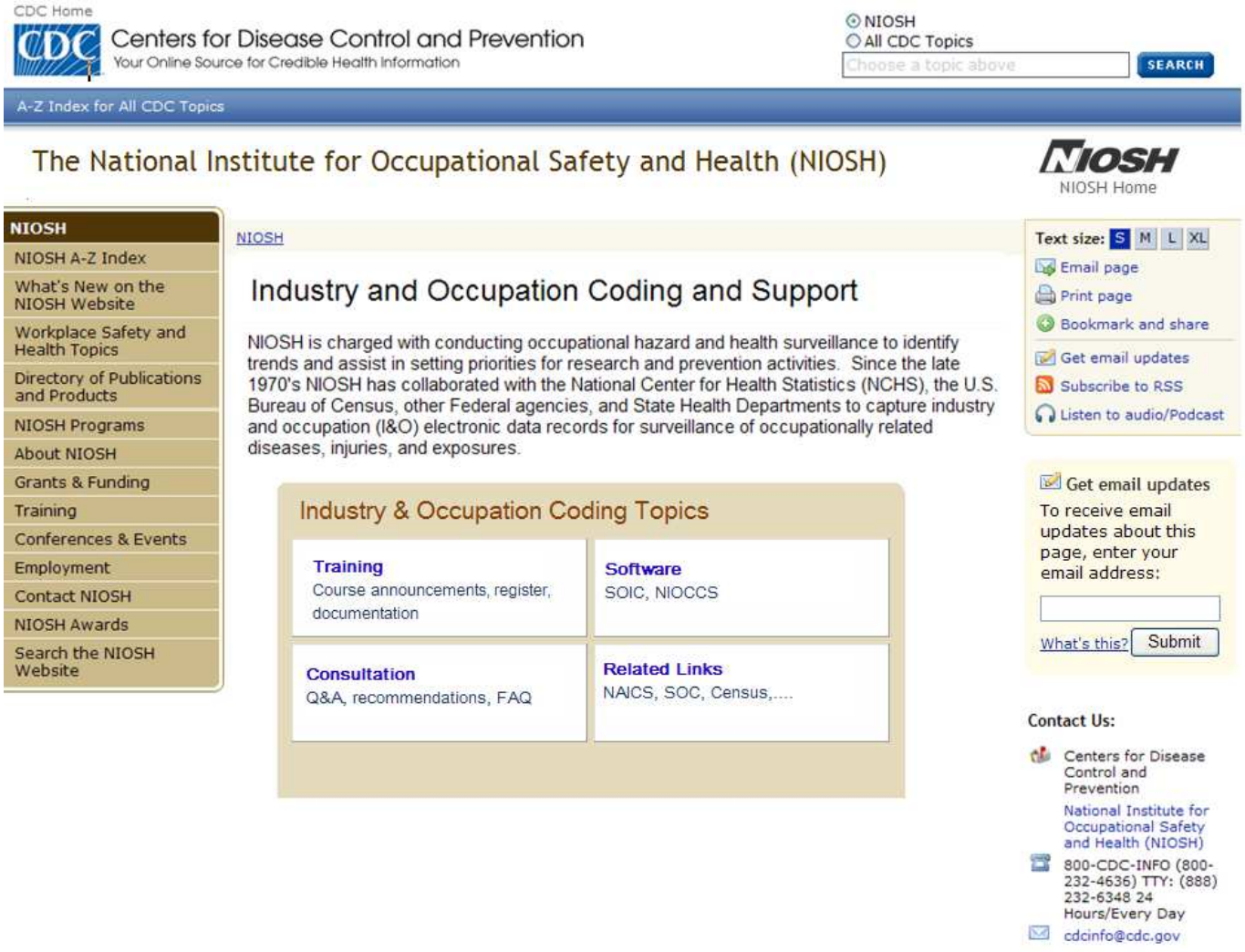
Passwords
Each user account will be assigned a password. The password will be initially assigned at the time of an account request but can be changed by the user via the *My Profile* system module.

5. Accessing NIOCCS

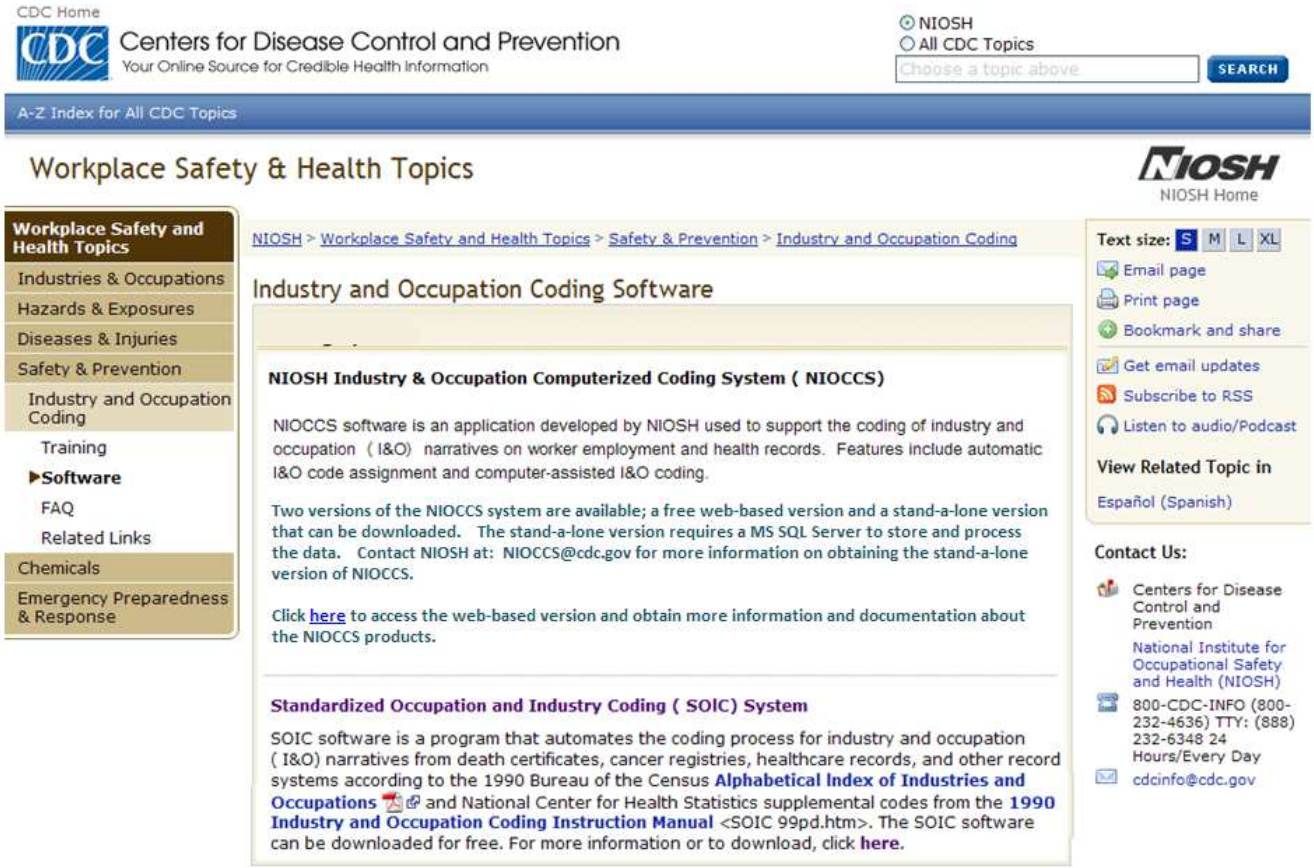
5.1 NIOSH Industry and Occupation Coding & Support web page

A new NIOSH internet topic page for Industry and Occupation Coding & Support will provide a portal for accessing the web-based version of NIOCCS along with information regarding I&O coding and NIOSH support. This page will include general information about I&O coding, notices about and registration for upcoming I&O coding training, I&O coding frequently asked questions (FAQ), links to related sites, and NIOSH contact information . The web page will also provide links to I&O coding software.

To access the NIOCCS software, the user would click on the **Software** section on the example web page as shown below.



To access the web-based version of NIOCCS the user would click on the link identified in the NIOCCS section of the I&O Coding Software page.

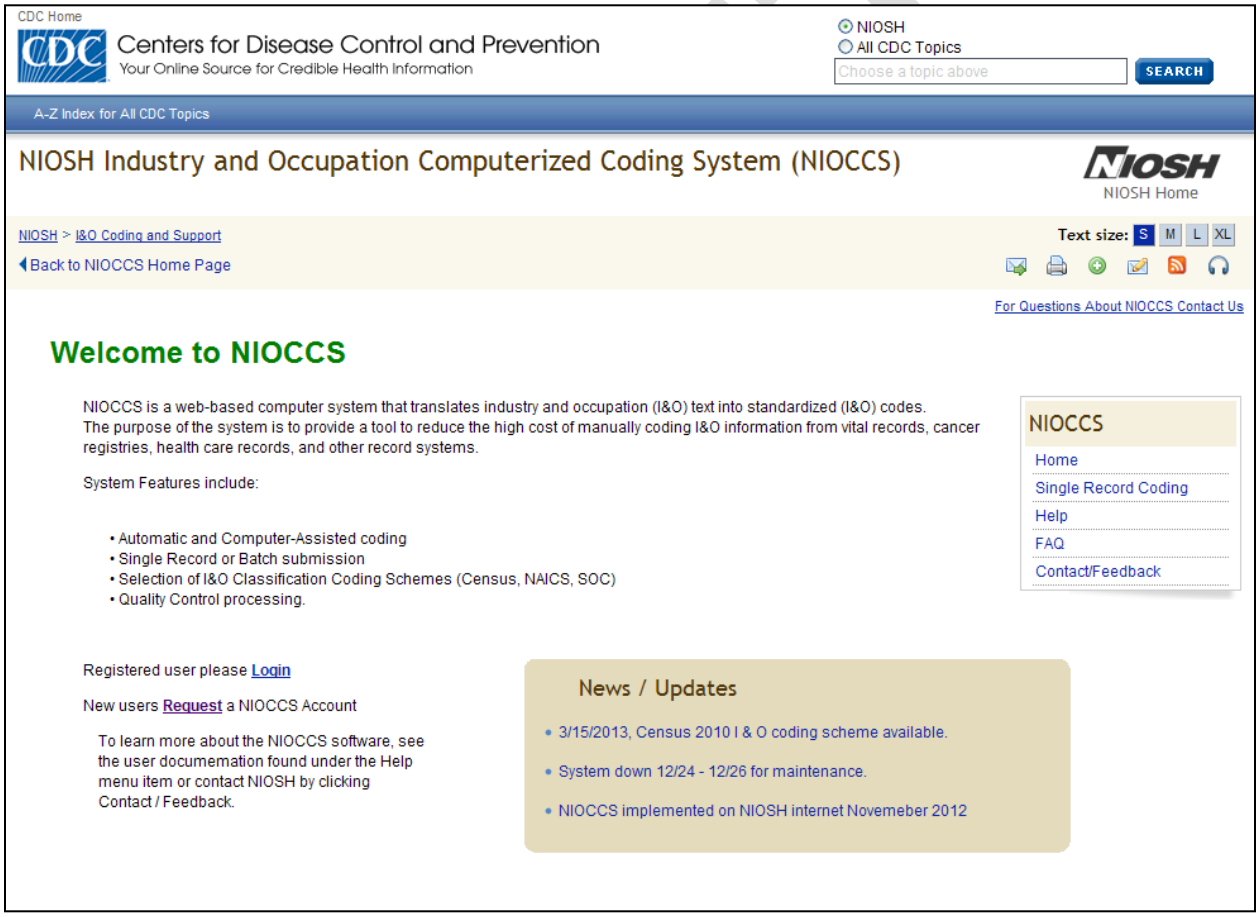


5.2 NIOCCS Home Page

The design for the web-based version of NIOCCS home page is shown below. The NIOCCS home page welcomes the user, provides a brief description of the system, and will display messages to the user as appropriate regarding notices such as recent updates, planned down times, etc.

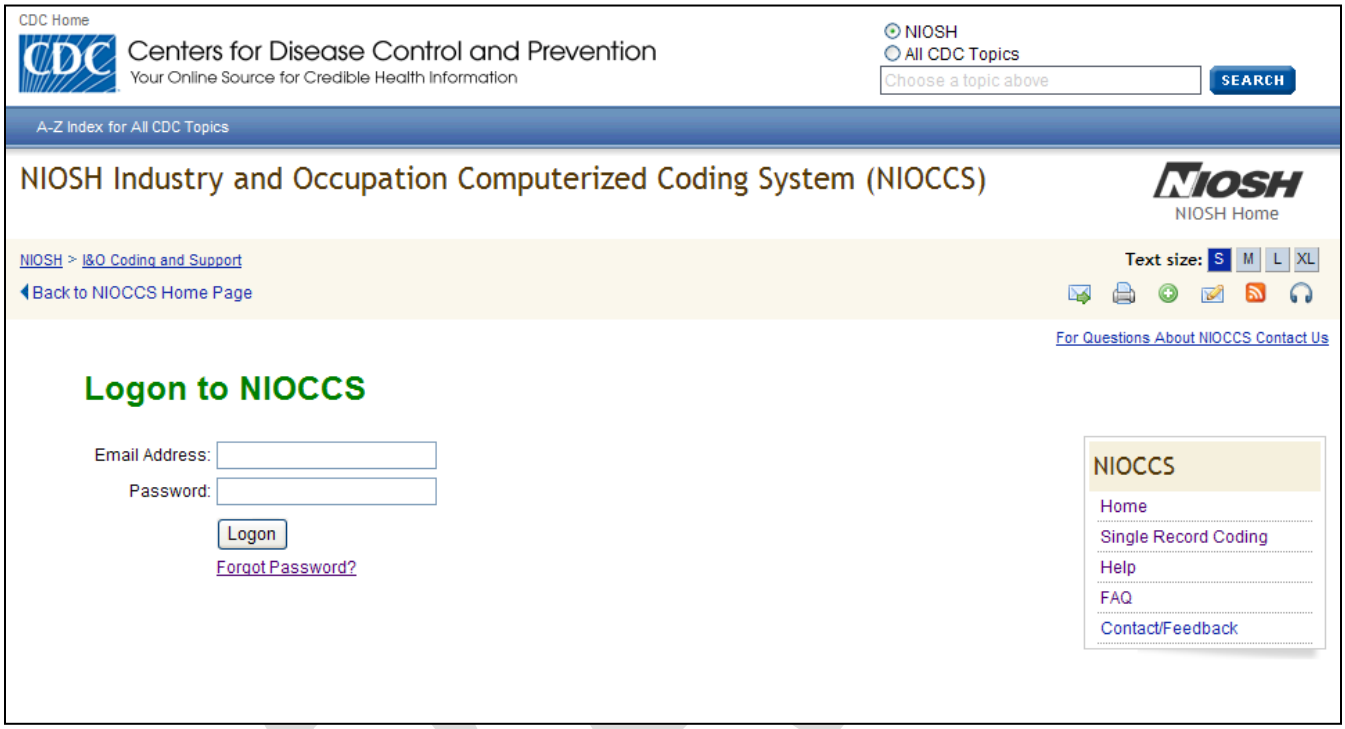
In this example, the ***user has not logged in to NIOCCS*** yet. Options provided in the menu are available without having a NIOCCS account. Users who wish to upload and process batches of records for I&O coding will be required to request a NIOCCS account.

Once a NIOSH account is obtained and the user has logged in, the full NIOCCS menu will be displayed.



5.3 Logon

Once a user has received a password, he/she may logon to the NIOCCS system. From the NIOCCS web-based system home page, click the **Login** link and the following screen will appear:



The first time a user logins into NIOCCS the system will display the **My** Profile screen and require the user to change the account password. (See chapter 8 – My Profile for more information on changing a password).

6. User Profiles (My Profile)

Each user of NIOCCS will have a user profile. These profiles are managed by the user. The screen is used to enable the following functions:

- Identify the user to NIOSH for communication purposes.
- Allow for modification of user information, such as organization name or user phone number.
- Allow for modification of a user's password.
- Set system default preferences.

7. Automatic and Computer-Assisted Coding

Both I&O Coding and Crosswalk coding functions will provide for automatic generation of codes (no manual intervention required) and computer-assisted coding (manual review required) features.

Autocode Confidence Level Setting

The user will be able to select a confidence level setting which NIOCCS will use to determine if the I&O text can be automatically coded. This feature allows different users to set their own unique criteria for accuracy and production in which automatically assigned codes must meet. I&O narratives will be processed by the NIOCCS coding engine where the system algorithms will compute a confidence level for each possible code candidate. Records that meet the user specified autocode confidence level will be automatically coded by assigning the I&O codes having the highest system computed confidence level among all those that meet the confidence level setting. Records not automatically coded will be made available for coding manually in the computer-assisted coding module of the system.

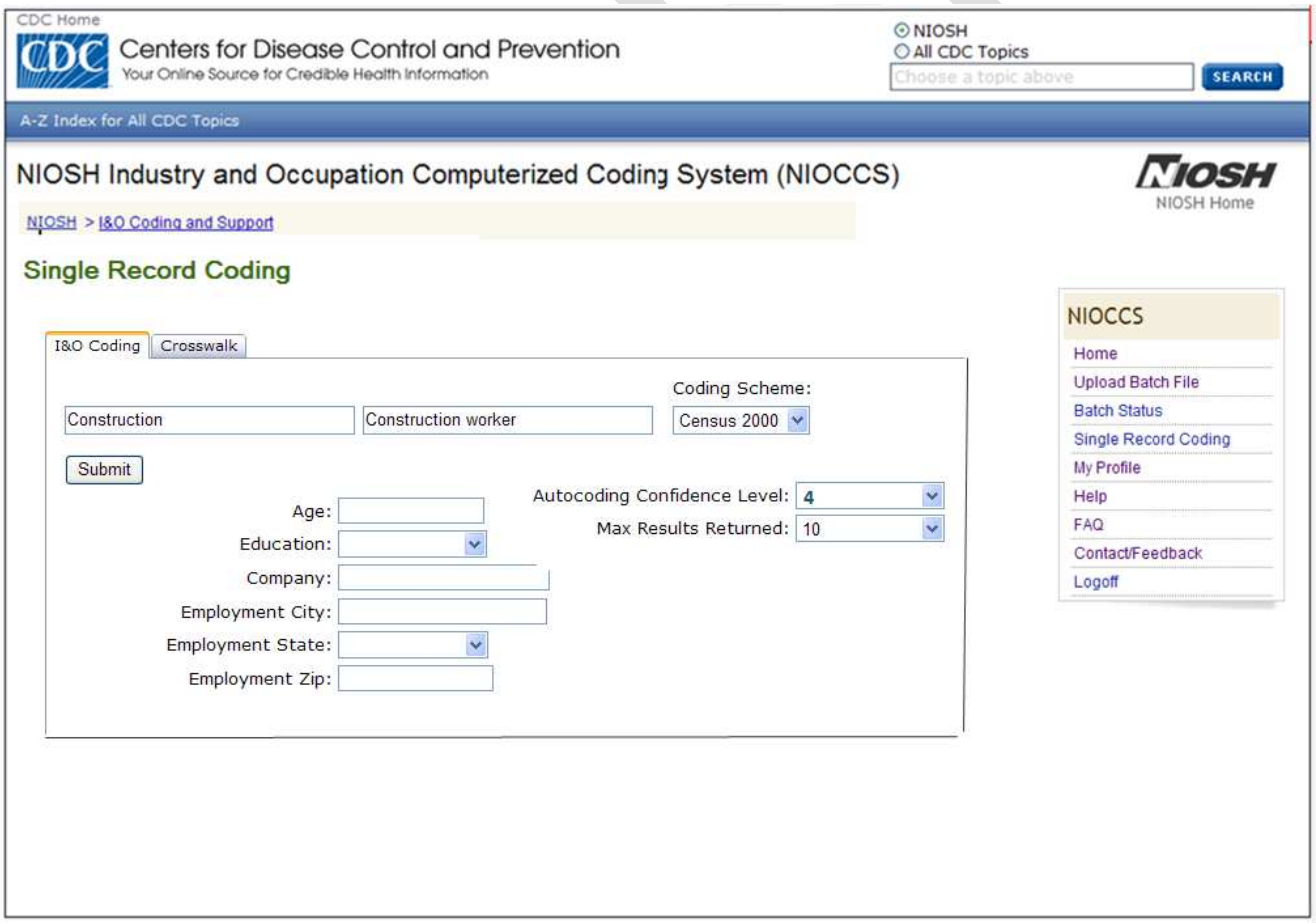
NIOCCS will be able to re-code records already coded based on one I&O classification coding scheme to a different I&O classification coding scheme or to a different version (year) of the same classification coding scheme. This process is known as crosswalking. Users may submit either a single record for crosswalk coding or they may submit a batch of records to be crosswalked.

8. Single Record Coding

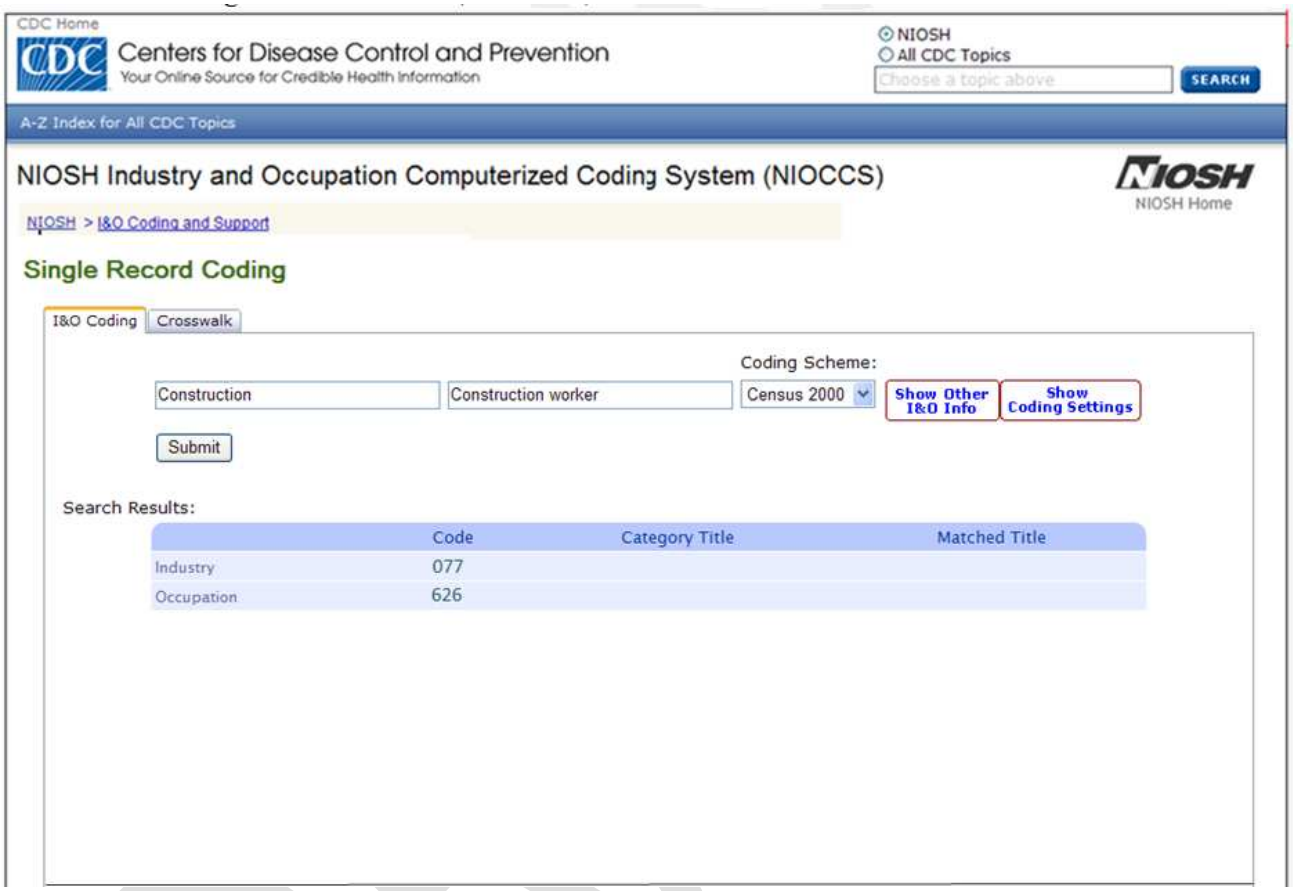
8.1 I&O Single Record Coding

A user may submit a single record containing industry and/or occupation text to the system for coding. After the user types in the required information, NIOCCS will return the coded results to the user. If NIOCCS cannot automatically code the input data at the confidence level selected by the user, the system will return all possible code candidates found and give the user the option to review and choose the best code.

To obtain I&O codes for one record, the user must click on the **Single Record Coding** menu item then click on the **I&O** tab of the Single Record Coding screen. An example of the Single Record coding screen is shown below. This screen might also be used by a user to test autocoding confidence level settings.

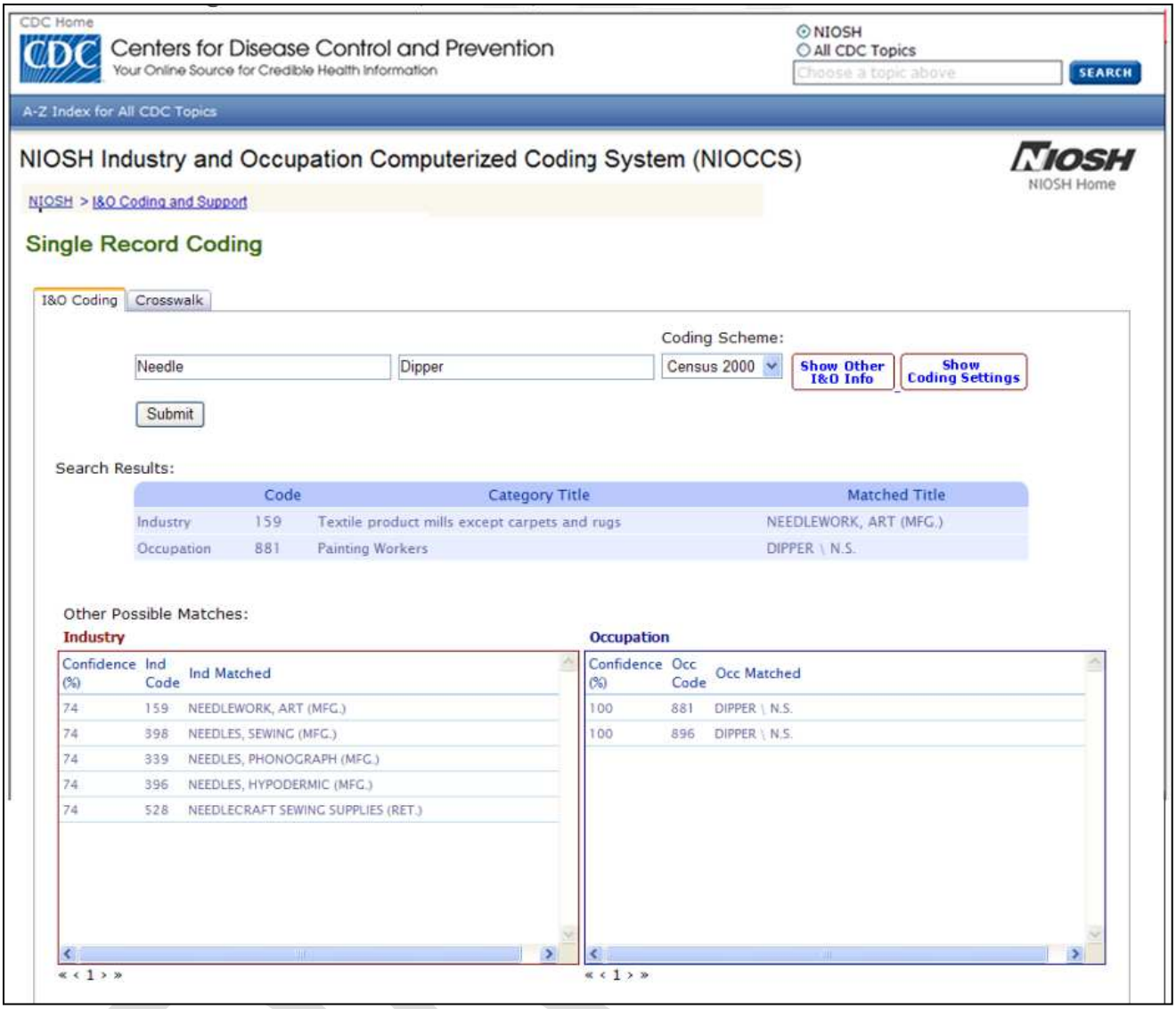


After the user enters the information to be coded and clicks the **Submit** button, NIOCCS will process the information and return I&O codes automatically if the coding engine finds codes that meet the user selected autocoding confidence level (see below).



In cases where NIOCCS cannot automatically code the I&O text within the autocoding confidence level setting, the system will display the code candidates found by the coding engine. The user may then review the code candidates and decide the appropriate code(s). The number of code candidates returned will not exceed the number entered in the Max # Results Returned. For example, if the system finds 20 code candidates for the given record and the user has entered 10 in the Max # Results Returned field, then only the top 10 code candidates will be returned ordered by descending confidence score.

Below is an example screen containing the results of a coding request that could not be automatically coded by the system.

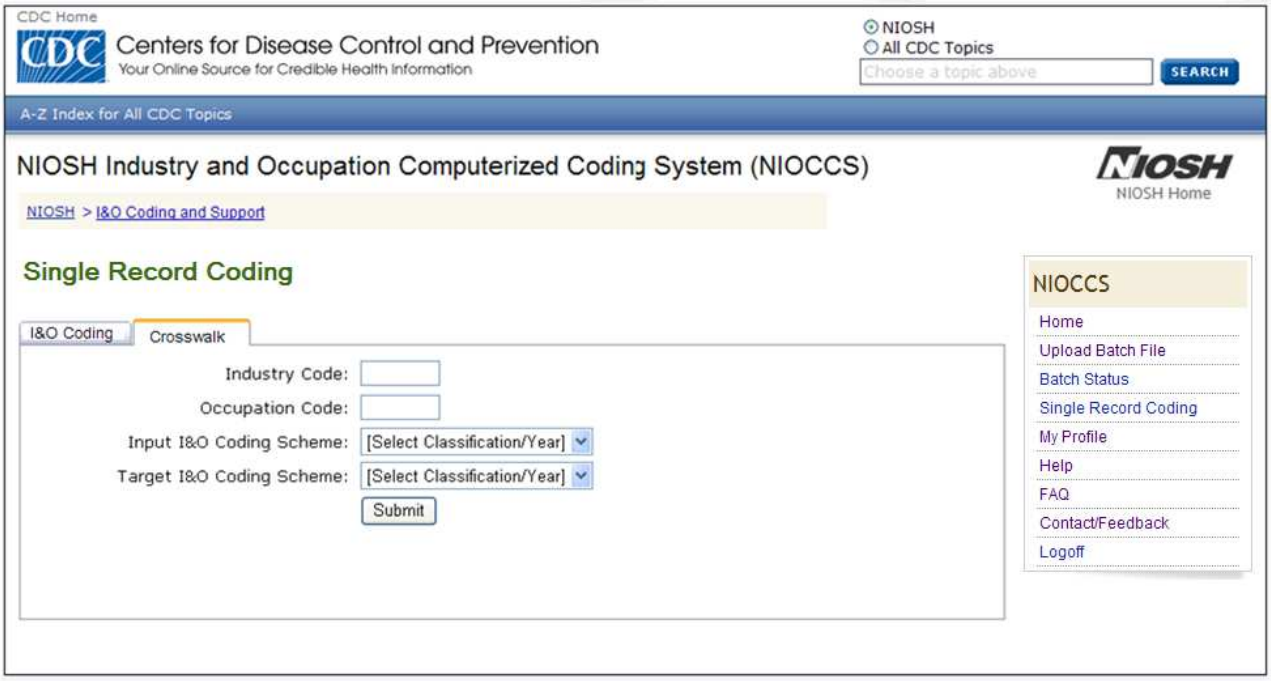

CDC Home
Centers for Disease Control and Prevention
Your Online Source for Credible Health Information
NIOSH
All CDC Topics
Choose a topic above
SEARCH
A-Z Index for All CDC Topics
NIOSH Industry and Occupation Computerized Coding System (NIOCCS)
NIOSH Home
NIOSH > I&O Coding and Support
Single Record Coding
I&O Coding
Crosswalk
Coding Scheme:
Needle
Dipper
Census 2000
Show Other I&O Info
Show Coding Settings
Submit
Search Results:
Code
Category Title
Matched Title
Industry 159 Textile product mills except carpets and rugs NEEDLEWORK, ART (MFG.)
Occupation 881 Painting Workers DIPPER \ N.S.
Other Possible Matches:
Industry
Confidence (%)
Ind Code
Ind Matched
74 159 NEEDLEWORK, ART (MFG.)
74 398 NEEDLES, SEWING (MFG.)
74 339 NEEDLES, PHONOGRAPH (MFG.)
74 396 NEEDLES, HYPODERMIC (MFG.)
74 528 NEEDLECRAFT SEWING SUPPLIES (RET.)
« < 1 > »
Occupation
Confidence (%)
Occ Code
Occ Matched
100 881 DIPPER \ N.S.
100 896 DIPPER \ N.S.
« < 1 > »

8.2 Crosswalk Single Record Coding

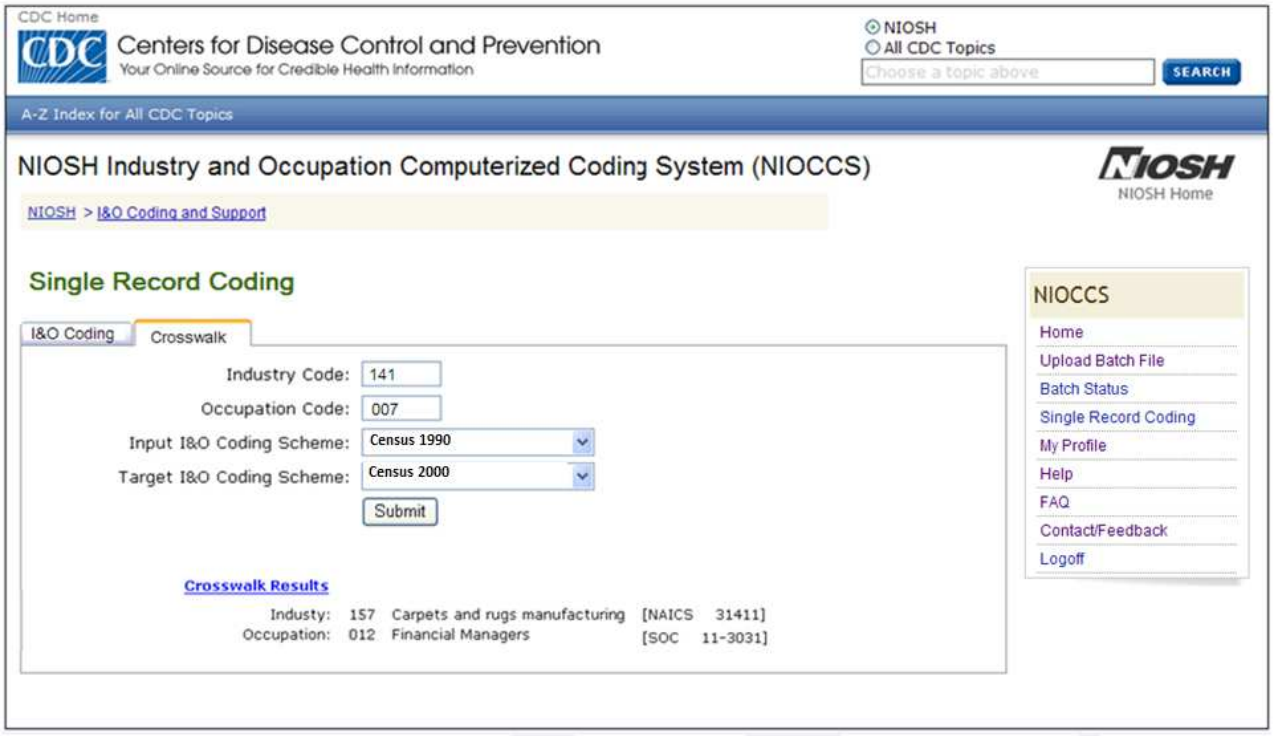
NIOCCS will be able to re-code records already coded based on one I&O classification coding scheme to a different I&O classification coding scheme or to a different version (year) of the same classification coding scheme. This process is known as crosswalking. Users may submit either a single record for crosswalk coding or they may submit a batch of records to be crosswalked.

A user may submit a single record containing industry and/or occupation codes for crosswalk coding. After the user types in the required information, NIOCCS will return the crosswalked coding results to the user. For codes that crosswalk to multiple codes in the target I&O coding scheme, NIOCCS will return all possible code candidates found for the user to review.

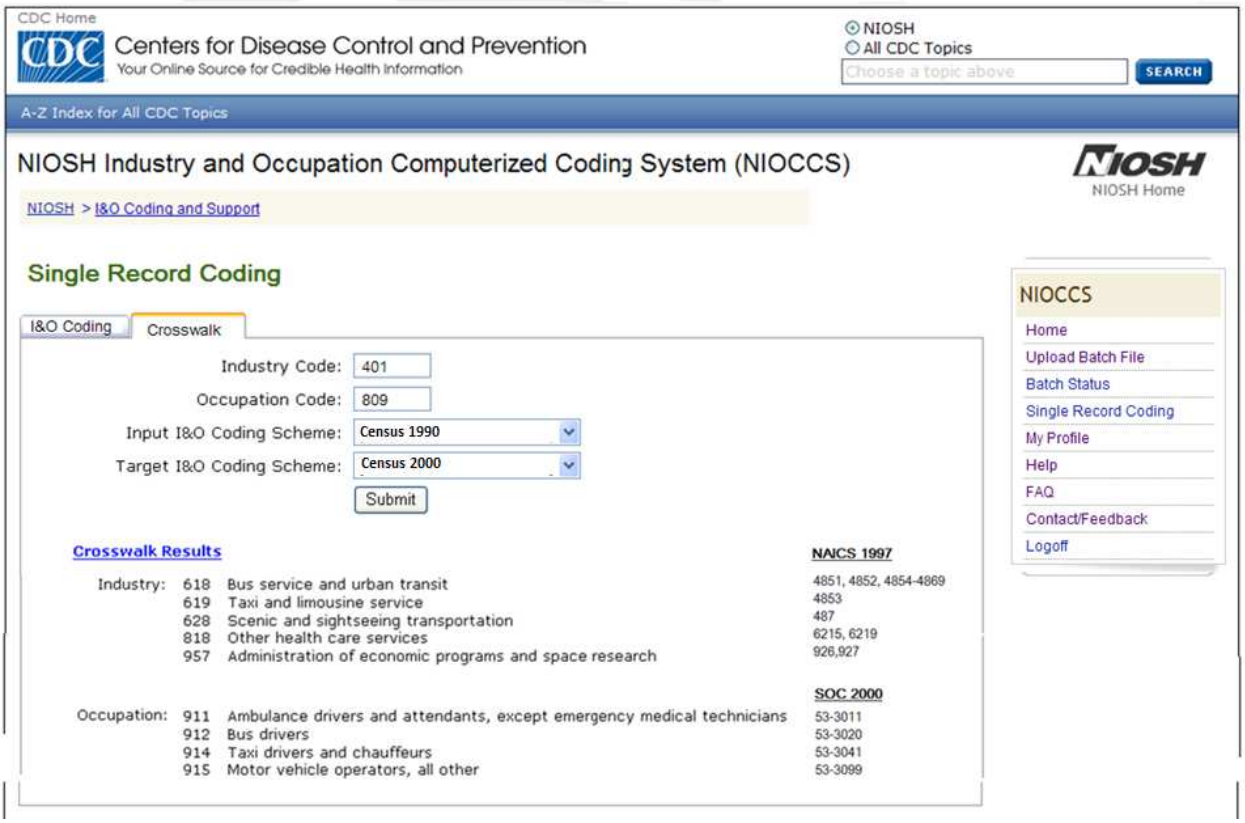
To crosswalk I&O codes for one record, the user must click on the **Crosswalk** menu item on the NIOCCS menu then click on the **Single Record** tab of the Crosswalking screen. An example of the Single Record crosswalk coding screen is shown below.



After the user enters the information required to perform crosswalk coding and clicks the **Submit** button, the following screen will appear containing the coded results.



In cases where the crosswalk results in a one to many situation, the system will display all potential codes in the target I&O coding scheme. The user may then review the code candidates and select the best industry and/or occupation code. Below is an example screen containing the results of a crosswalk coding request that has a one to many coding result.



9. Batch File Coding

9.1 I&O Batch File Coding

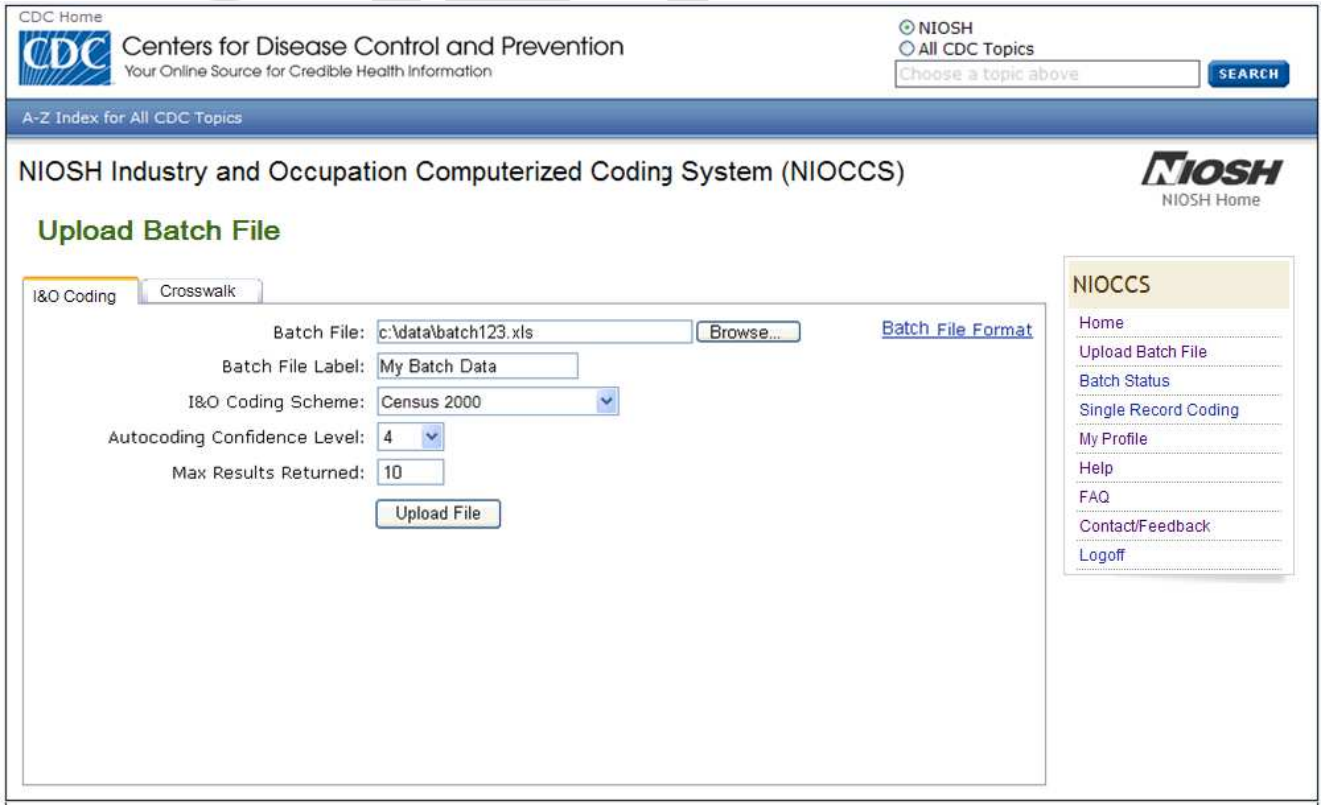
NIOCCS provides the capability of processing records in batches. Batch record submission refers to data being uploaded to NIOCCS in a file rather than manually entered and searched one record at a time. Once the file is uploaded, NIOCCS will invoke the I&O coding engine to process the file. After the processing is completed, the number of records automatically coded and the number needing manual review can be obtained by clicking on the **Batch Status** menu item.

Until full load testing is accomplished it is not easy to determine if a limit on the number of records allowable for uploading at one time needs to be established. Conservatively, we are estimating that it will be most efficient to submit no more than 10k records per batch at any one time. This limit may be adjusted depending on time of day records are submitted and/or after results are confirmed through full load testing of the system.

9.1.1 Uploading Data for I&O Coding

To process a data file for I&O coding, the user must click on the **Upload Batch File** menu item then click on the I&O Coding tab of the Upload Batch File screen. The user enters the file path and name to be uploaded along with NIOCCS coding specifications. Once the **Upload File** button is clicked, NIOCCS will perform checks to ensure the file was created according to the required format and data rules prior to processing for I&O coding. If errors are found, NIOCCS will identify the records and/or issues in error and return descriptive information so that the user can make necessary corrections.

An example of the Upload Batch File screen is shown below.



9.1.2 I&O Batch File Format

The following **fixed file format** must be used to submit data in batch mode to NIOCCS. Fields DO NOT need to be padded with spaces to fill unused positions, however each fields, including optional fields, must be delimited by a pipe character (|). **Each record submitted must have a value in at least one of the fields: Industry Title, Occupation Title, or Employer Company Name.**

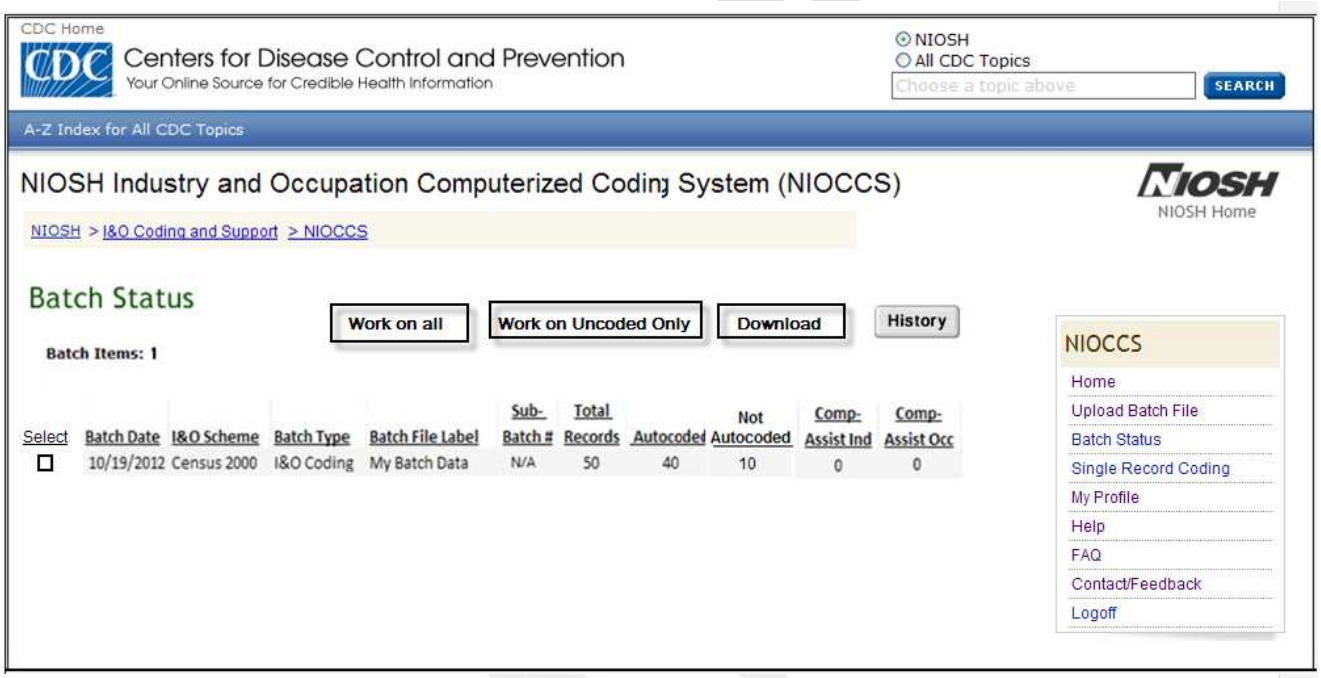
I&O Batch File Format					
Field	**Field Sequence**	**Format**	**Length**	**Comments**	
User specified unique identifier	1	Alpha-Numeric	50	Required. Must be unique value per record **Example: 12345, or ID12345**	
Industry Title	2	Alpha-Numeric	250	At least one of these three fields must contain a value.	**Example: "Information Technology"**
Occupation Title	3	Alpha-Numeric	250		**Example: "Consultant"**
Employer Company Name	4	Alpha-Numeric	250		**Example: "ABCD Motor Company"**
Job duties	5	Alpha-Numeric	250	Optional. Enter text to describe job duties of the occupation. Used during the computer-assisted module to help user decide on the most accurate occupation code. **Example: "assembling nuts and bolts"**	
Products	6	Alpha-Numeric	250	Optional. Enter types of products the industry produces. Used during the computer-assisted module to help user decide on the most accurate industry. **Example: "Mowing machines"**	
Employer City	7	Alpha-Numeric	50	Optional. **Example: "Cincinnati"**	
Employer State	8	Alpha	2	Optional.	

I&O Batch File Format				
Field	**Field Sequence**	**Format**	**Length**	**Comments**
				Example: "OH"
Employer Zip	9	Alpha-Numeric	10	Optional.
Age	10	Alpha-Numeric	15	Optional. **Examples: "25" or "25+" or ">25" or "30-35" or "senior"**
Education level	11	Alpha-Numeric	50	Optional. Valid Values: 1 = <12 years education 2 = High School diploma or GED equivalent 3 = 1-4 years college 4 = > 4 years college
Residence County	12	Alpha-Numeric	50	Optional. **Example: "Kenton"**
Residence State	13	Alpha-Numeric	2	Optional. **Example: "KY"**
User defined field1	14	Alpha-Numeric	250	Free text field used for user defined purposes only.
User defined field2	15	Alpha-Numeric	250	Free text field used for user defined purposes only.

9.1.3 Batch Status

Once a batch file of records has been uploaded successfully, the user can review the status of all batches submitted by clicking the **Batch Status** menu item. Below is an example of how the Batch Status screen would look based on the uploaded file from the previous section. In this example, only one file has been uploaded so far. If the user had uploaded more than one file then each file would be displayed in a separate line.

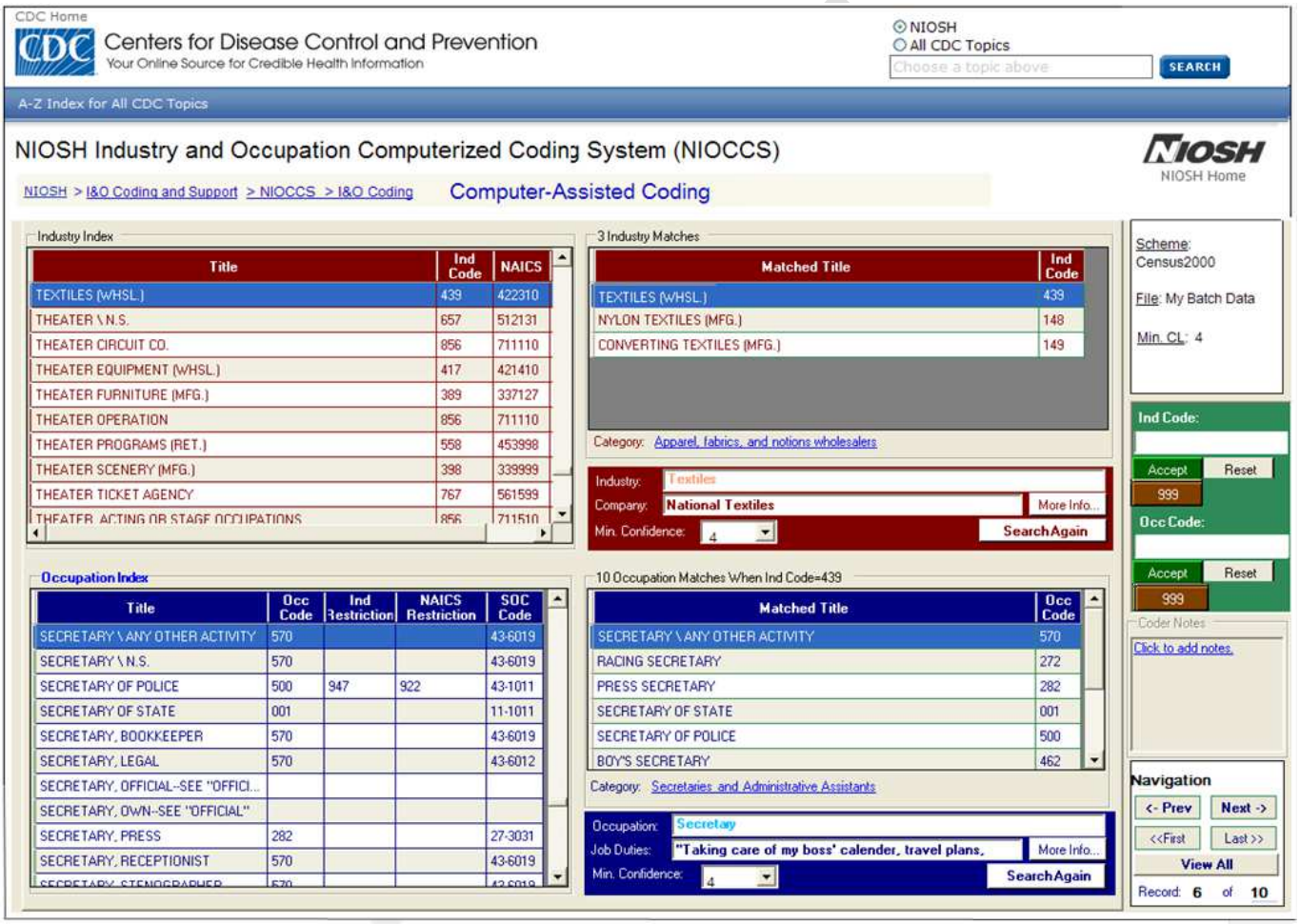
To perform an action on the batch file (computer-assisted coding or download), the user must select the batch file by clicking the select box next to the batch file of interest then click one of the function buttons at the top of the screen.



9.1.4 Computer-Assisted Coding (I&O)

When a user selects a batch file and clicks one of the Computer-Assist coding options from the **Batch Status** screen, records that were not automatically coded will be displayed one at a time so that the user can review and choose the correct or best I&O codes. This process is called computer-assisted coding because the NIOCCS system provides information and functions to support the coder in determining the correct I&O codes for a given record.

The screen below is an example of the computer-assisted coding module in NIOCCS.



9.2 Crosswalk Batch File Coding

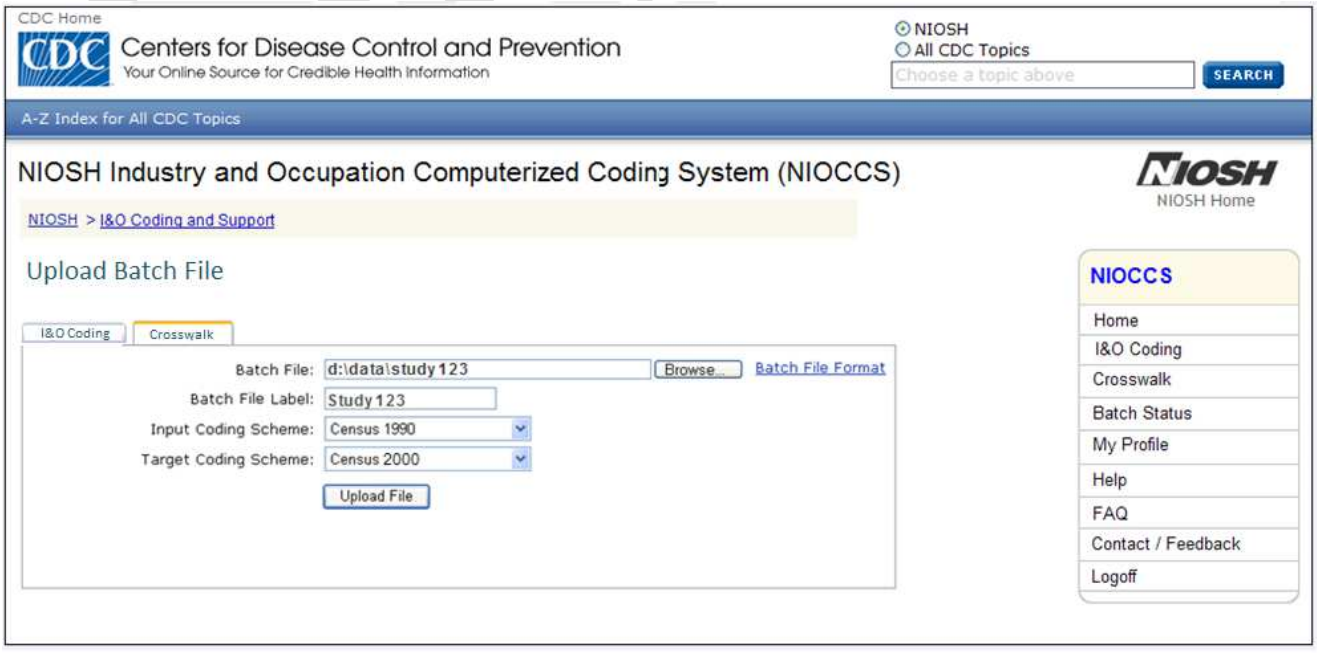
NIOCCS provides the capability of processing records for crosswalk in batches. Batch record submission refers to data being uploaded to NIOCCS in a file rather than manually entered and searched one record at a time. Once the file is uploaded, NIOCCS will invoke the Crosswalk coding engine to process the file. After processing, the number of records automatically crosswalked and the number needing manual review can be obtained by clicking on the **Batch Status** menu item.

Until full load testing is accomplished it is not easy to determine if a limit on the number of records allowable for uploading at one time needs to be established. Conservatively, we are estimating that it will be most efficient to submit no more than 10k records per batch at any one time. This limit may be adjusted depending on time of day records are submitted and/or after results are confirmed through full load testing of the system.

9.2.1 Uploading Data for Crosswalk Coding

To process a file of records for Crosswalk coding, the user must click on the **Upload Data** menu item then click on the **Crosswalk** tab of the screen. The user enters the file path and name along with NIOCCS options for crosswalking. Once the **Upload File** button is clicked, NIOCCS will perform checks to ensure the file was created according to the required format and data rules. If errors are found, NIOCCS will identify the records and/or issues in error and return descriptive information so that the user can make the necessary corrections.

An example of the Batch Upload screen is shown below.



9.2.2 Crosswalk Batch File Format

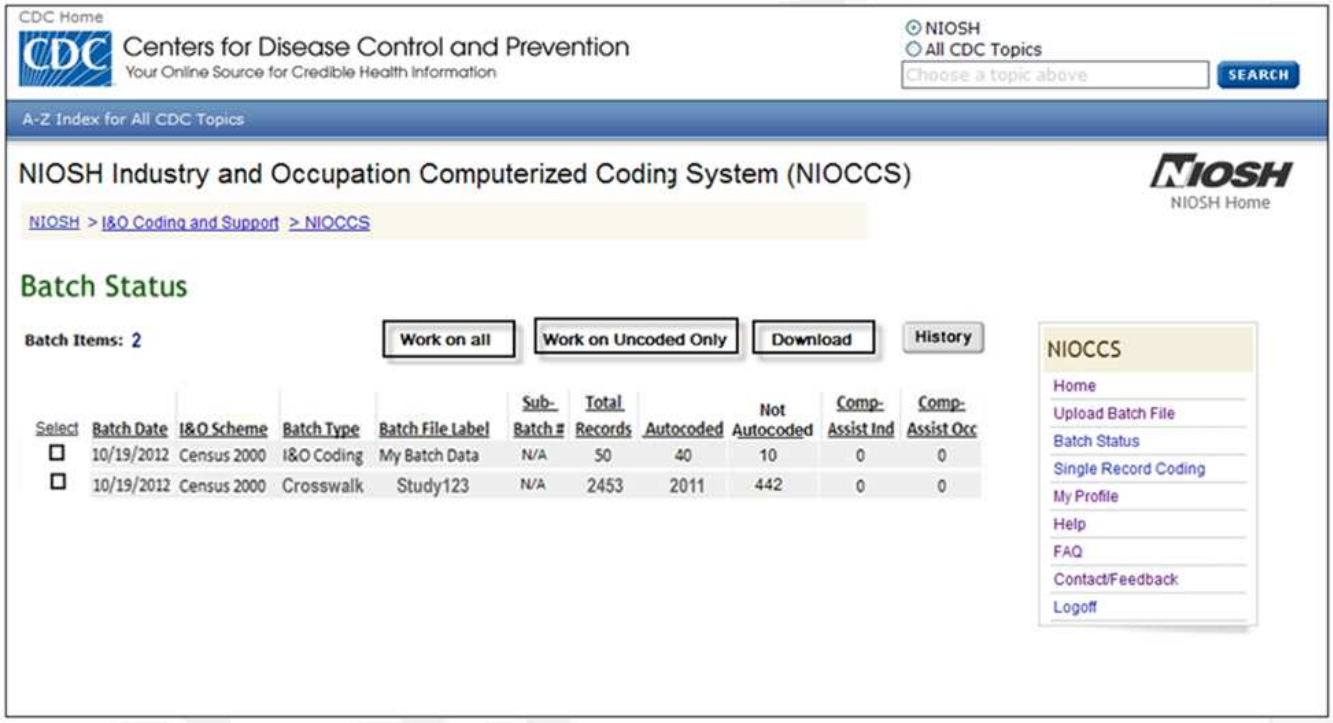
The following **fixed file format** must be used to submit data for crosswalk coding in batch mode to NIOCCS. Fields DO NOT need to pad the unused positions. However, all fields, including optional fields, must be delimited by pipe character (|).

Crosswalk Batch File Format				
Field	**Position**	**Format**	**Length**	**Comments**
User specified unique identifier	1	Alpha-Numeric	50	Required Must be unique value per record **Example: 12345, or ID12345**
Industry code	2	Numeric	4	Required if industry code is being cross walked. **Example: 947**
Occupation code	3	Numeric	4	Required if occupation code is being cross walked. **Example: 770**
Industry Text	4	Alpha-Numeric	250	Optional. Will be displayed in computer-assisted screens to aid in selecting the best crosswalk code. **Example: "Information Technology"**
Occupation Text	5	Alpha-Numeric	250	Optional. Will be displayed in computer-assisted screens to aid in selecting the best crosswalk code. **Example: "Consultant"**

9.2.3 Batch Status

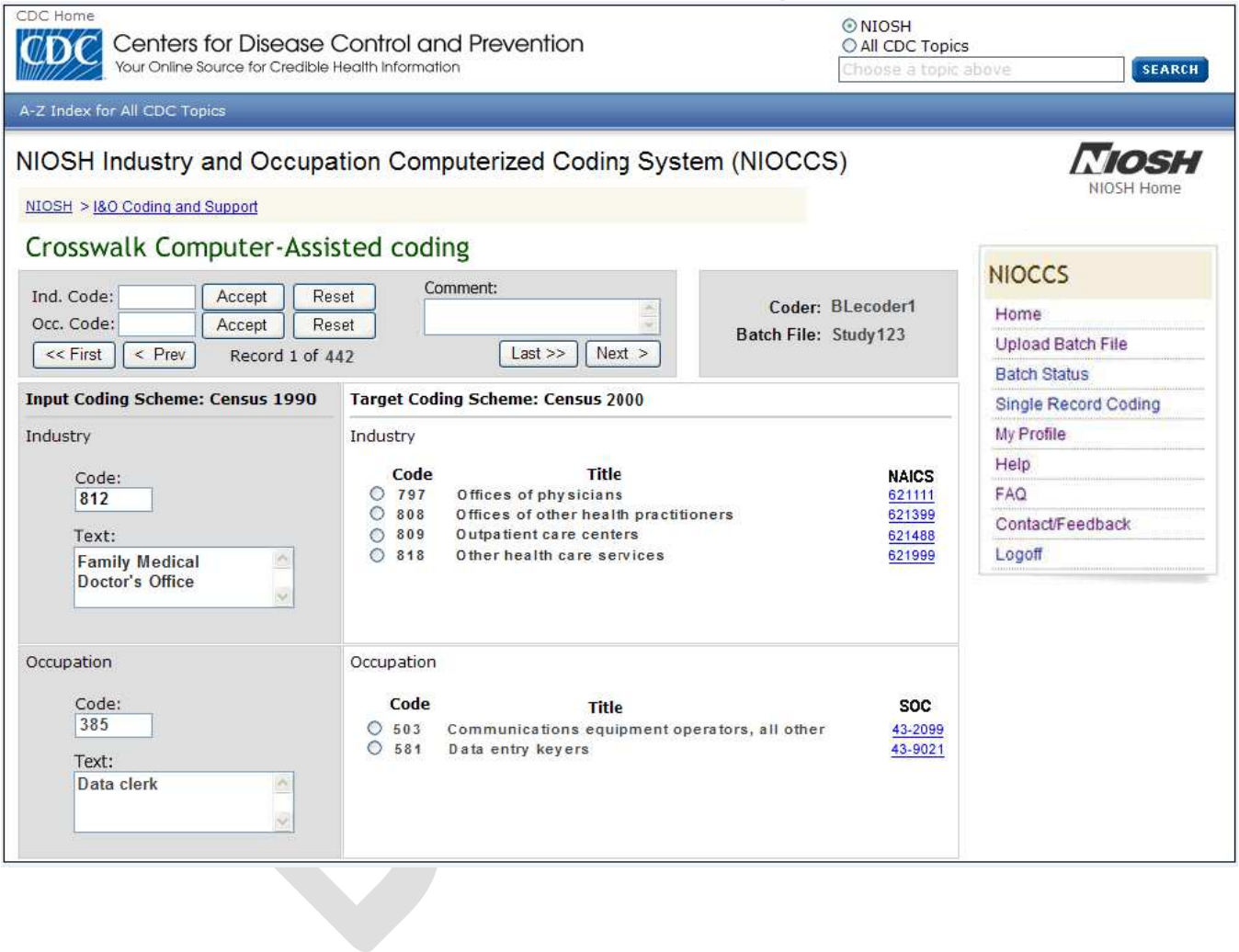
Once a batch file of records has been uploaded successfully, the user can review the status of all batches submitted by clicking the **Batch Status** menu item. Below is an example of how the Batch Status screen would look based on the uploaded files from the previous sections. Notice that the first batch has a type of 'I&O Coding' and the second has a batch type of 'Crosswalk'.

To perform an action on the batch file (computer-assisted coding or download) , the user must select the batch file then select an option from the pop-up menu displaying the available actions for the selected batch file.



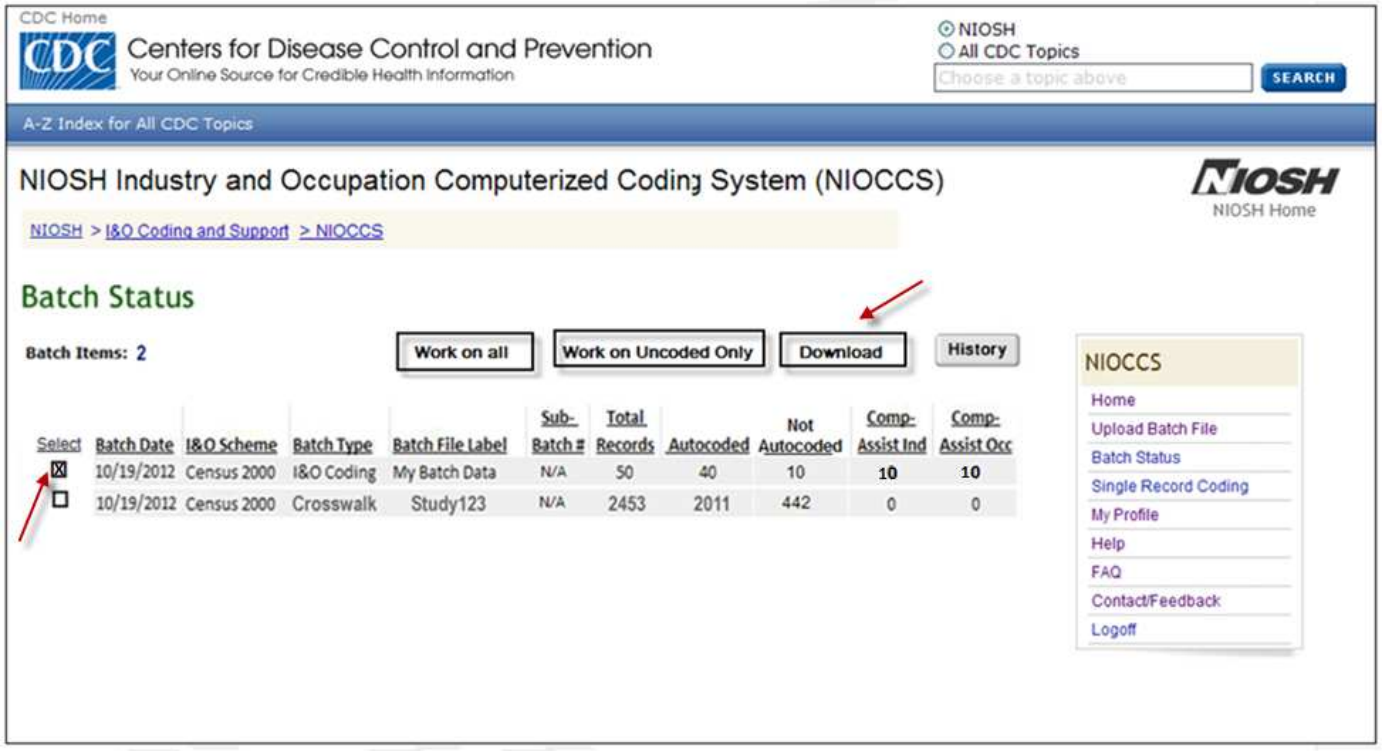
9.2.4 Computer-Assisted Coding (Crosswalk)

When a user selects a crosswalk batch file and clicks one of the Computer-Assist coding options from the **Batch Status** screen, the records that were unable to be automatically crosswalked will be displayed one at a time for review. The user may select the best codes from those displayed under the target coding scheme for I&O. The screen below is an example of the crosswalk computer-assisted coding module.



9.3 Downloading

Once all coding processes are complete, the file is ready to download to the user's computer. To download a batch file, select the batch file from the Batch Status screen and click the **Download** button at the top of the screen.



After the **Download** button is clicked, a message box will appear to show the progress of the download. If the download is successful, a message will be displayed on the screen stating such and the batch file will be removed from the Batch Status screen. If the download is not successful, the user will be notified on the screen and the batch file will remain on the Batch Status screen until it is successfully downloaded. Users can contact NIOSH via phone or email if problems occur during download.

NIOCCS will store a copy of the batch file on the CDC server for a period of 30 days in case the download process malfunctions or the user otherwise finds problems with the downloaded file. After 30 days the file will automatically be deleted from the CDC server, however summary information will be maintained by the system in order for users to review a history of batch submissions.

The format of the file downloaded will be similar to the format used to upload with additional fields included containing the I&O codes.

9.3.1 I&O Coded Data File

The following **fixed file format** will be used as the download file format for I&O coded records. All fields will be delimited by pipe character (|).

I&O Download File Format			
Field	**Position**	**Format**	**Length**
User specified unique identifier	1	Alpha-Numeric	50
Industry Title	2	Alpha-Numeric	250
Occupation Title	3	Alpha-Numeric	250
Employer Company Name	4	Alpha-Numeric	250
Job duties	5	Alpha-Numeric	250
Products	6	Alpha-Numeric	250
Employer City	7	Alpha-Numeric	50
Employer State	8	Alpha	2
Employer Zip	9	Alpha-Numeric	10
Age	10	Alpha-Numeric	15
Education level	11	Alpha-Numeric	50
Residence County	12	Alpha-Numeric	50
Residence State	13	Alpha-Numeric	2
User defined field1	14	Alpha-Numeric	250
User defined field2	15	Alpha-Numeric	250
Census Coding Scheme	16	Numeric	4
NAICS Coding Scheme	17	Numeric	4
SOC Coding Scheme	18	Numeric	4
Census Industry Code	19	Numeric	4
Census Occupation Code	20	Numeric	4
NAICS Code	21	Numeric	4
SOC Code	22	Alpha-Numeric	7

9.3.2 Crosswalk Data File

The following **fixed file format** will be used as the download file format for crosswalk coded records. All fields will be delimited by pipe character (|).

Crosswalk Download File Format			
Field	**Position**	**Format**	**Length**
User specified unique identifier	1	Alpha-Numeric	50
Input Industry code	2	Numeric	4
Input Occupation code	3	Numeric	4
Input Industry Text	4	Alpha-Numeric	250
Input Occupation Text	5	Alpha-Numeric	250
Input Coding Scheme	6	Alpha-Numeric	10
Target Coding Scheme	7	Alpha-Numeric	10
Target Industry Code	8	Numeric	4
Target Occupation Code	9	Numeric	4

10. Reports

NIOCCS will also provide a **Batch History Report** to enable users to review all batches submitted to NIOCCS over time. To do this, the user can select the **History** button from the Batch Status screen. A sample report design is below.

The NIOCCS development team will gather more information from stakeholders on additional reporting needs during the next phase of the project and will add an addendum to this interface design document containing new report designs.

NIOCCS Batch History

Batch Type: I&O Coding

Batch File	Upload Date	Download Date	Coding Scheme	Total Records	# Autocoded	# Computer-Assisted Coded

Batch Type: Crosswalk

Batch File	Upload Date	Download Date	Input Coding Scheme	Target Coding Scheme	Total Records	# Autocoded	# Computer-Assisted Coded

11. Help and User Support

NIOSH plans to provide support for I&O coding in several forms. A general topic page for I&O coding and support will be available from the CDC NIOSH public web site. This web site will be the primary portal for NIOSH I&O coding support. It will provide information about upcoming I&O coding training sessions, answers to frequently asked questions (FAQ), a link to the NIOCCS system, links to related sites, and NIOSH contact information for I&O questions and consultation.

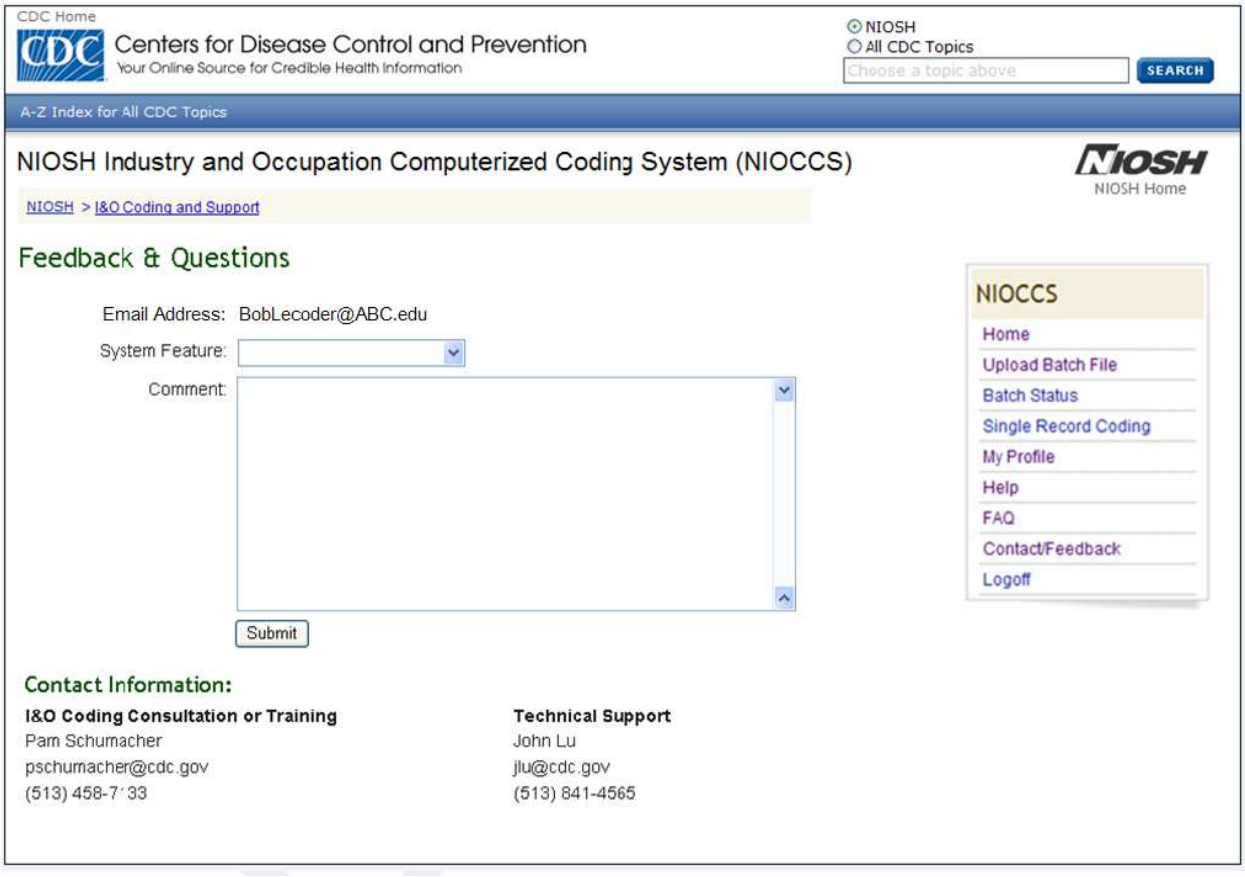
Support for the web-based NIOCCS system will be provided through on-line user documentation, training, and system capabilities to provide feedback or report problems.

11.1 NIOCCS On-line User Documentation

On-line documentation will be provided that describes the operating procedures of the system in detail. This documentation can be printed in hardcopy if desired by the user. To access the User Documentation, click on the **Help** item from the NIOCCS Menu. The on-line documentation will include a table of contents, indexing, and search features to aid the user in locating the information needed.

11.2 Providing Feedback and Reporting problems

To provide feedback on NIOCCS system performance and/or ask questions regarding the system functionality, the user can click on the **Feedback** item of the NIOCCS menu. This will cause the following screen to appear allowing the user to send a comment/question to NIOSH. Once the **Submit** button is clicked, the information provided will be sent to the NIOCCS system administrators who will respond as soon as possible via email or phone.



Appendix A: Glossary

Autocoding – A process by which information (data) is evaluated by computer algorithms and translated automatically into a standard set of codes. No human intervention is required.

Autocoding Confidence Level – The confidence level that must be satisfied by a code candidate in order to be automatically selected by the coding engine without the intervention of the user.

Batch File – An electronic file containing a group of records that are prepared in a required format to be processed for an operation.

BLS – Bureau of Labor Statistics

Business Requirements – High level objectives of the organization or customer who requests the system.

Business Rules - a statement that defines or constrains some aspect of the business or operation to be performed.

Census I&O Classification codes – Bureau of Census Alphabetical Index of Industries and Occupations.

Coding Engine – The main computer program that performs the logic for translating data into a standard set of I&O codes. It consists of smaller program units that implement individual coding processes.

Computer-assisted coding – A process which by computer software supports a person in the translation of information (data) from text format to a standardized set of codes. Requires human intervention and decision making.

Constraint – A restriction that is imposed on the choices available to the developer for the design and construction of the product.

Crosswalk – Mapping a code from one I&O classification coding scheme to another I&O classification coding scheme or to a different code within the same I&O coding scheme for a different year.

Customer – Anyone who uses the NIOCCS system.

Download - To receive data to a local system from a remote system.

FAQ – Frequently Asked Questions

Functional Requirements – Specifications for the software functionality that the developers must build into the product to enable users to accomplish their tasks, thereby, satisfying the business requirements.

Home Page - Main web page of a website of a group, company, organization, or individual.

I&O Coding Scheme – One of several industry and occupation classification systems used to assign standard codes to industry and/or occupation text. Examples include: Census alphabetical Indexes for

I&O, the North American Industrial Classification System (NAICS), and the Standardized Occupational Classification system (SOC).

Industry Text – The actual word or words entered on employment, health and vital records to describe an individual's place of employment (industry).

Instruction Manual, Part 19B – Procedures developed by the National Center for Health Statistics (NCHS) to provide state and local health and vital statistics agencies with a uniform system for coding I&O entries reported on death certificates. Adapted from Bureau of Census industry and occupation classification system.

NAICS – The North American Industrial Classification System is an industry classification system that groups establishments into industries based on activities in which they are primarily engaged. NAICS is the first classification created for uniform industry codes between the United States, Canada and Mexico.

NAPHSIS – National Association for Public Health Statistics and Information Systems.

NIOCCS – National Institute for Occupational Safety and Health Industry and Occupation Computerized Coding System.

NIOSH – National Institute for Occupational Safety and Health

NCHS – National Center for Health Statistics

Non-functional Requirements – A description of a property or characteristic that a software system must exhibit or a constraint that it must respect, other than an observable system behavior.

NORA - The National Occupational Research Agenda (NORA) is a partnership program to stimulate innovative research and improved workplace practices. Unveiled in 1996, NORA has become a research framework for NIOSH and the nation. Diverse parties collaborate to identify the most critical issues in workplace safety and health. Partners then work together to develop goals and objectives for addressing these needs.

Occupation Text - The actual word or words entered on employment, health and vital records to describe an individual's occupation.

Process Flow Diagram – A diagram used to indicate the general flow of an application process.

Production Rate – Percentage of the phrases that are assigned an I&O code automatically among the total input phrases submitted for coding.

Relational Database - Relational databases store data as rows and columns in table form, much like a spreadsheet. The data is then organized and accessed according to relationships between the columns of those tables; utilizing a key "ID" to relate a row of data in other tables.

Section 508 - In 1998 the US Congress amended the Rehabilitation Act to require Federal agencies to make their electronic and information technology accessible to people with disabilities. **Section 508** was enacted to eliminate barriers in information technology, to make available new opportunities for people with disabilities, and to encourage development of technologies that will help achieve these goals. The

law applies to all Federal agencies when they develop, procure, maintain, or use electronic and information technology. Under Section 508 (29 U.S.C. & 794d), agencies must give disabled employees and members of the public access to information that is comparable to the access available to others.

SOC – The Standardized Occupational Classification system developed by the Bureau of Labor Statistics for classifying all occupations in the economy, including private, public, and military occupations. The SOC system was first introduced in 1977, was updated in 1980 and again in 2000.

Stakeholder – A person, group, or organization that is actively involved in a project, is affected by its outcome, or can influence its outcome.

System Design - The process or art of defining the hardware and software architecture, components, modules, interfaces, and data for a computer system to satisfy specified requirements.

System Analysis – The science dealing with the analysis of complex, large scale systems and the interactions within those systems. Steps included in systems analysis include surveying the feasibility of the project; studying and analyzing the current system; defining end-user-requirements; recommending feasible solutions.

Upload - The sending of data from a local system to a remote system such as a server or another client with the intent that the remote system should store a copy of the data being transferred.

User – A customer who will interact with a system either directly or indirectly. Also called end user.

User Account – Mechanism used to authenticate a user to a system. It provides the opportunity for a user to be authorized to access a system and control access to features of a system.

User Class – A group of users for a system who have similar characteristics and requirements for the system.

User Interface - The aggregate of means by which people interact with a system, machine, device, computer program or other complex tool.

User Requirements – Describe use goals or tasks that the users must be able to perform with the system or product.

Web Application – An application that is accessed with a Web browser over a network such as the internet or intranet.

Web Service - Web-based applications designed to support interoperable machine to machine interaction, such as the exchange of data, over a network.

Web Template - A tool used to separate content from presentation in web design, and for mass-production of web documents. A web template operates similarly to a form letter for use in setting up a website.