WHO FAMILY OF INTERNATIONAL CLASSIFICATIONS NETWORK MEETING WHOFIC/05.B.3.4

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Title: **From Paper to Database**
- Exploring an Electronic Database Environment for ICF

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Purpose: Electronic Tools Committee

Presented in: Breakout sessions of committee

Relates to: ICF

Intended for: Discussion

Introduction

There has been considerable interest and heightened awareness in the International Classification of Functioning, Disability and Health (ICF) since the Word Health Assembly launched it in October 2001. As people become more aware of ICF they want to be able to access it quickly and effortlessly. While ICF is a small classification (compared to ICD), and it is not unreasonable to expect users to have the book close at hand, many people spend a good part of each day in front of a computer and prefer to have their classifications and resource material on line or at least available electronically.

This paper will take a very quick, high-level look at two electronic database environments (the storage of structured information) as they may relate to ICF. One is the World Health Organization's (WHO) hypertext version of ICF on the WHO web site[1]. The other is the Canadian Institute for Health Information's (CIHI) electronic relational database application for ICD-10-CA/CCI[2].

A basic database principle of the relational model is that all information is represented by data values in relations. Since data is constantly changing, an important rule of the relational database is that it must have the capability of not only handling the retrieval of data but also the insertion, update and deletion of data. Also important is that the relational database allows for the multi-level child entity. This feature supports the 'nesting' or hierarchical expansion of codes within the ICF and other classifications.

[1] http://www3.who.int/icf/onlinebrowser/icf.cfm
[2] products:http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=RC_51_E&cw_topic=51

Parent tables are created; one for each meaningful combination that has children in the original table. Objects or images can also be mapped or interfaced to these databases.

System Requirements

For publication purposes of a classification electronically, the system requirements should include:

- a comprehensive, integrated process for compiling and deploying content for use by internet, intranet and offline users (CD / DVD);
- a system that is reliable, scalable and capable of delivering gigabytes of information to thousands of people every day;
- systems that are efficient, cost effective and meet all publication formats;
- have the ability to pull and assemble from a variety of file systems and sources;
- contain the full range of classifications that relate to a particular clientele or market;
- the index, tabular and content for each classification needs to be stored and fully searchable;
- the publication application should install the licence management components for distribution purposes;
- desirably a teaching or demonstration component would be integrated;
- unique views and functionality should be set for each classification;
- powerful and intuitive search, navigation and viewing capabilities; and
- a publication system that will support any continuing demand for the paper and PDF format of the classifications.

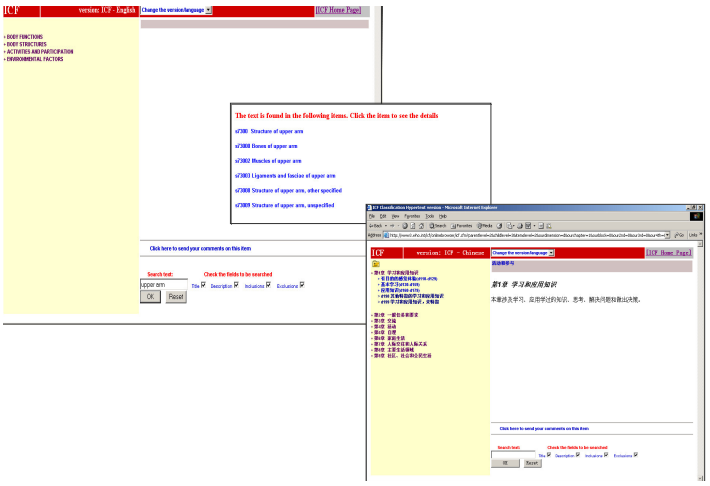
SOME FEATURES OF TWO ELECTRONIC APPLICATIONS:

1) **The World Health Organization (WHO) Hypertext Version of ICF**

The World Health Organization (WHO) hypertext version of ICF on the WHO web site is a very effective and comprehensive electronic version of the ICF. This web-based product it is available free, worldwide.

This hypertext version has been built in ColdFusion (.cfm). "ColdFusion is an application that creates HTML pages from a database. It is a fast way to build and deploy internet applications. From this application printable documents in PDF can be generated."[3]

[3] http://www.macromedia.com/software/coldfusion/



This internet application of ICF has two-word searching capability and it can readily switch between languages.

The WHO hypertext version of ICF has a number of user-friendly features. The table of contents can be continuously expanded. At each level of granularity the tabular appears on the other half of the screen.



The ability to communicate through a link directly with the developer of the online product is another convenient feature.

2) Canadian Institute for Health Information's (CIHI) Electronic Relational Database Application for ICD-10-CA/CCI

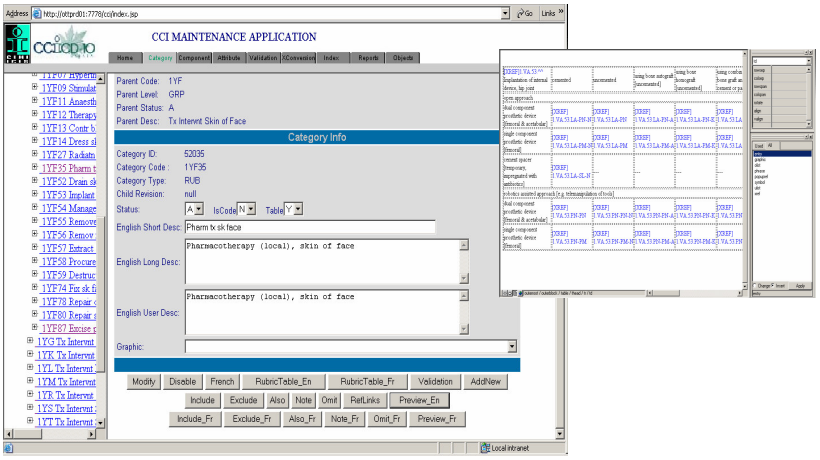
Some of the key requirements for the ICD-10-CA/CCI systems are:

- provide the content of the classifications in CD-ROM, print format, PDF and HTML;
- publish the front matter, the back matter with a summary of the new codes and the disabled codes, the codes with includes, excludes and notes (a comprehensive tabular), diagrams and the complete index,
- publish in both English and French;
- version control must be maintained through the system;

- system reports need to be generated while maintaining the classifications. These reports provide information about the accuracy and completeness of the data entered in the java application and the XML editor; and
- the ICD-10-CA/CCI application must have the ability to interface to other applications such as the Discharge Abstract.

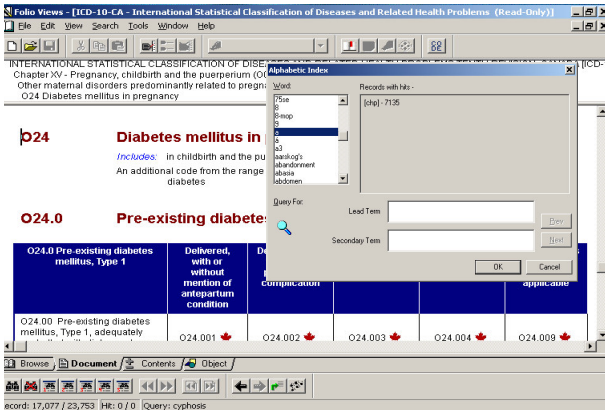
In ICD-10-CA/CCI maintenance changes and updates to large blocks of text and tables are made using an XML editor. A Java application is used to maintain the category codes and index and link the language versions. The Java application allows the system user to create, modify and disable category codes, validation codes, attribute codes, conversions and category code components.

Error!

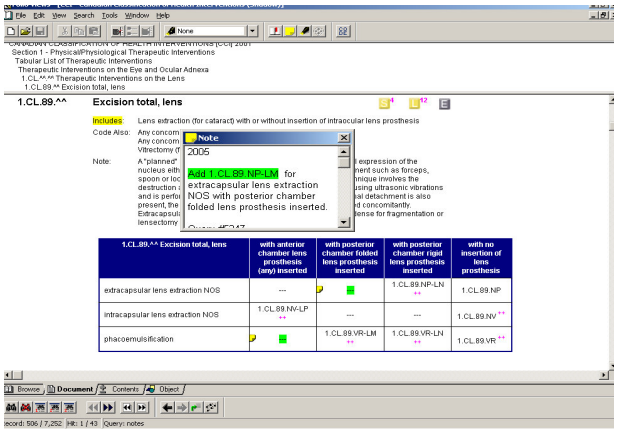


Currently CIHI is using Folio Views Version 4.1 as the publishing application system. It has a number of advantageous features:

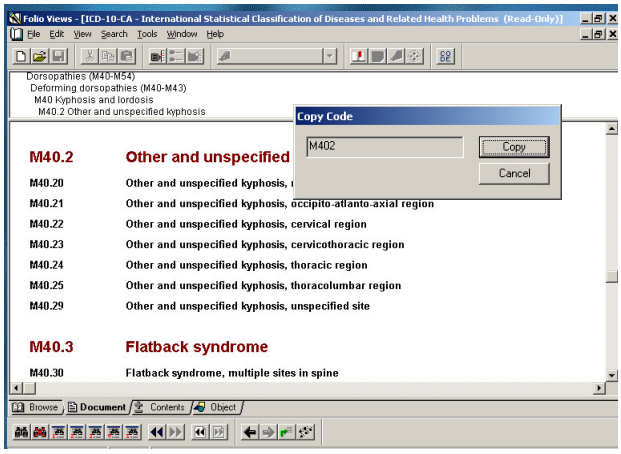
- all index entries have jump links and take the user directly to codes in the tabular - the index and the tabular do not appear on the same screen;
- the index in ICD-10-CA is used to search through the document on key words and character strings. This greatly facilitates and accelerates the user's code search; and
- Folio has been modified to allow for additional search engines specific to ICD-10-CA and CCI. Search engines are specific to the index, tabular and tables – drug, neoplasm, and external cause of injury.



- An important feature of the Folio Views is the Shadow File. The Shadow File is used for jotting electronic notes throughout the classifications as required.



- The copy code utility tool facilitates the selection of codes and eliminates key entry errors.



Summary

Both the WHO hypertext version of ICF and the CIHI approach for ICD10-CA/CCI using Folio meet the needs of many users of WHO classifications every day. Both systems are fast, searchable and reliable. Folio includes a few more features and product lines and supports two major classifications. Both applications can be applied in most settings.

In the near future it will be important that any electronic version of ICF can be integrated, mapped or interfaced to the Electronic Health Record (EHR). If this does not become a reality, there is a risk that ICF would not be a part of the EHR. This will also put in jeopardy accessibility to a complete set of data using the international standard of classifications for the continuum of care and the potential to collect outcome data from the EHR.

ICF might also be another classification bundled into the WHO classification product line – for example in Canada it may be possible to bundle ICF with ICD-10-CA and CCI. This would support tracking data associated with the continuum of care including diagnosis, interventions and functioning or outcome.

Other critical documents could be bundled with or linked to ICD-10 and ICF if they are also built in an electronic database. These may include Coding Standards, the Coding Manual being developed by WHO with the American Psychological Association (APA), standardized measurement/assessment tools such as the Functional Independent Measure (FIM) and potentially, demonstration or teaching modules. These links would support the sustainability of quality data.

Particularly in the clinical setting, rapid access to large amounts of data is required. When it comes to the collection and use of data, 'time is money'. It is important that future developments, updates and revisions be available to the ICF users worldwide without delay. This is only possible through the electronic format. In today's environment it is possible to deploy updated files dynamically through an HTTP or HTTPS server to all online, offline and intranet users via the web without distributing new CDs or paper products. This spontaneous approach integrates the updated information with the customer's information and avoids sending or installing updates.

Conclusion

Databases are the preferred method of storage for large multi-user applications, where coordination between many users is needed. The relational model is not only very mature, but it has developed a strong knowledge on how to make a relational back-end fast and reliable, and how to exploit different technologies. Maintaining data, text and objects while establishing version control is very easy to accomplish in a database.

There are many opportunities for ICF to penetrate every corner of the world.