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User's Guide to the On-Line Bibliographic Reference System for the NIST Process Planning Testbed

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Abstract

The National Institute of Standards and Technology is in the process of establishing a testbed which will serve the research and information needs of the process planning community. Part of this testbed is an on-line annotated bibliographic service dedicated to process planning publications. This document provides the information necessary for one to become a registered user and begin using this service. It also provides information on interfacing with the software; i.e., the specific commands and syntax for writing queries, commenting on and scoring citations, as well as using the on-line documentation. Policies and procedures regarding the submission of new citations, inclusion of citations, editing, commenting and scoring of citations are also provided in this text.

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Disclaimer

Certain commercial equipment, instruments, or materials are identified in this paper. Such identification does not imply recommendation or endorsement by the National Institute of Standards and Technology, nor does it imply that the products identified are necessarily the best available for the purpose.

Introduction

The National Institute of Standards and Technology has begun establishment of a testbed which will serve as a neutral arena for the comparison, integration and testing of process planning systems. The testbed will also service the information management and communication needs of the process planning community by providing on-line access to relevant information bases, mailing lists, newsgroups and by conducting regular workshops. In this manner the testbed will serve as a conduit of information, issues and advancements in the field of process planning, and will help unify development approaches adopted by academia, industry and government research programs.

Part of this testbed is an on-line annotated bibliographic service connected to the Internet and dedicated to process planning publications. The service provides traditional bibliographic functions such as searches and additionally allows users to anonymously annotate any citations with their opinions on that work. A voluntary scoring mechanism has been implemented which allows publications to be ranked by the process planning community itself. This dynamic annotation process should prove useful to researchers new to the field, by quickly pointing them to the seminal works as judged by the community.

A search was conducted to select a system which would provide the majority of the functionality required for this service. Requirements were defined, possible candidate systems were identified, differences between systems were weighed and a system was chosen. The selected system was IRX, an information retrieval system initially developed at the National Library of Medicine then modified at Johns Hopkins University Welch Laboratory for Applied Research in Academic Information. The Process Planning Testbed (PPTB) was given the system and full source code at no cost. Extensions were made to IRX to support the PPTB's specific requirements.

This document provides the reader with the information necessary to access and contribute to the On-Line Bibliographic Reference System's information base of precess planning citations. The following section of this document explains how to get an account and password, what equipment is required, and how to access the information base. The next section provides information on interfacing with the software; i.e., the specific commands and syntax for writing queries, commenting on and scoring citations, as well as using the on-line documentation. Policies and procedures regarding the submission of new citations, inclusion of citations, editing, commenting and scoring of citations are provided in the final section of this text.

Getting Started

Users can access IRX either by dialing in through a modem or by telnet across the Internet. Specific instructions for both means of access are enumerated in this section. Users must first register with the PPTB System Administrator to receive an account.

- Obtain the password to the PPTB account, an IRX user-id and password from the PPTB System Administrator by sending an e-mail request to pptb@cme.nist.gov or phoning (301) 975-3553.
- For access from a modem, use software available for communications between computers, such as KERMIT, which is available in the public domain. The NIST modems automatically adjust to any baud rate, up to 9600.

  1) Have the communications software dial 1-301-948-9720, which is the number for the NIST modem pool. If a connection is made, the response will be 'CONNECT'.
  2) Press the RETURN key for a response similar to the following:
     VCP-1000 v2.342
     NISTnet Modem Pool
     Please type HELP if you need assistance
     Enter username>
  3) Type one or more characters and press RETURN for a response of 'nistnet_x>' where 'x' is a port number.
  4) At the nistnet prompt, type 'connect mercury.cme.nist.gov' and press RETURN.
  5) At the login prompt, login to 'pptb'.
  6) IRX will be initialized automatically. Enter user-id.
  7) Please change your password immediately. To do so, type RETURN when prompted for a password then follow the instructions.

8) You will then be asked if you want to set the number of lines on your terminal screen. If you are dialing in or using telnet, chances are you will have to set this variable. To do so, respond ‘yes’ to this prompt, then enter the number of lines in your screen or window. This value is stored in the password file so that it does not need to be set for each IRX session.

- For access from computers on the Internet follow these steps:

1) Type ‘telnet mercury.cme.nist.gov’ for a response similar to the following.

   Trying 129.6.32.27...
   Connected to aruba.cme.nist.gov.
   Escape character is ‘^]’.
   SunOS UNIX (aruba)
   login:

2) Follow steps 5-8 from the above set of instructions for modem connection.

You should now be in IRX. You will see the IRX initialization screen followed by the Question Input menu. Exiting IRX will automatically end the login session. No interaction with the operating system of the host machine will be necessary (or allowed).

System Interaction

On-Line Help

The first two lines of the screen always display the major commands which can be invoked at any given time within that module. On-line help is available at almost any point during IRX execution. Simply type ‘??’ to get detailed information on commands. In the main modules of the system (Question Input, Document Reading, Document Selection) main help menus list all possible commands that can be executed in that module. From these main help menus, typing the command name displays detailed help on the command. Pressing the ESCAPE key returns you to the previous screen. An IRX User Manual is also available from the main help screens by typing ‘!’. The on-line help is extensive and will be the source of the most accurate and up-to-date information. The best way to learn IRX is by using it and relying on the help information associated with each menu.

Utility Commands

The Command Menu provides the user with general-purpose commands. These commands support input and editing of queries (Q), examination of vocabulary terms within the information base (V), browsing of the question history list (H), returning to the previous list of documents and the document reader menu (R), description of the defined database fields (D), help (??) and exiting (E). Aside from the last three commands, these commands invoke other major sections of the system that will be described in more detail later in this section.

Question Input

The Question Input screen is displayed upon initialization of IRX. IRX is a full-text system–searches will span each field in a citation including comments, scores, titles, etc. Questions can be entered in plain English or using a number of supported operators. Questions are terminated by RETURN; multiple paragraph questions are not allowed. IRX automatically wraps text at the end of a line. IRX uses a ranking algorithm and presents documents in order of expected relevance. Additionally, IRX supports question editing, boolean operators, field restriction, wild card matching, proximity searching and direct access to documents. In general, these functions operate on terms, which may consist of a word, a regular expression, a proximity expression or a parenthetical expression. Each of these features are described briefly below and in detail in the on-line help. Pressing the ESCAPE key from the Question Input menu will invoke the Utility Commands menu.

Editing: Before ending a question with RETURN, several commands are available for editing the query. These commands include commands to delete characters and words, move the cursor around within the question, insert questions from the question history list, clear the buffer and more.

Boolean Operators: IRX supports three Boolean operators, AND, OR and NOT. Boolean operators must be entered in all capital letters. Terms in questions that are not separated by Boolean operators are treated as if an OR operator is present. Terms can include other Boolean terms in parentheses.

Field Restriction: IRX documents are broken down into fields which can be shown by the 'D' option under the command menu. A term in a question can be restricted to a certain field or combination of fields by placing the list of field names in square brackets following the term. For example, typing 'generative [TI IX]' will return a list of citations where the word "generative" is found in the title or keywords. Field identifiers for fields that are searchable in the IRX database include the following:

NO - The document number

TI - Title of document

IX - Key terms

TX - Text field: for everything else

Wild Card Matching: This feature allows a term to be expanded into a group of related words. There are three wild card characters, '#', '$' and '*'. The user is presented with a list of words that match the expression. The user may select all or some of the presented words for inclusion in the query.

Proximity Searching: IRX approximates searching for phrases through what it calls proximity searching. A series of related terms can be surrounded by quotes as in "generative process planning." The system will look for any fields that have all of the enclosed terms in them. The resulting citations terms will contain all the terms, but they may be in any order and separated by other words. When the proximity expression is included in more complex expressions involving boolean operators and/or field restrictions, the expression is treated as one term.

Direct Access to Documents: Direct access to documents is accomplished through a combination of Proximity Searching and Field restriction. Typing the document number and restricting the proximity to the document number field yields one response, that article. Similarly, typing the title and restricting the field to the title field also returns one document.

Searching for Ratings: The scoring mechanism used in IRX allow searches for papers that are considered outstanding by the users of the information base. The scores are stored in the system as 'X's. To search for papers with a rating of 3 or better (scale is from 0-9), type the keywords, followed by AND, then three Xs. This query will return all papers with one or more of the given keywords that have been rated 3 or above. At the time of publication of this user's guide, very few of the citations have been ranked.

If no papers are retrieved, a message will be printed to that effect and the question can be modified.

Vocabulary Search
Vocabulary Reader

The Vocabulary Search and Vocabulary Reader functions allow the user to browse a list of all terms that have been indexed in the current database. When the vocabulary command is invoked, the Vocabulary Search screen is displayed. When a term to search for is entered, the term, if found, is displayed on the screen along with preceding and succeeding terms (in alphabetical order) and their frequencies in the database. If the term typed in is there, it is marked by two asterisks (**). If it is not there, the position where it would be located is marked with a greater-than sign (>). The Vocabulary Reader menu supports commands for paging up and down the vocabulary list, returning to the Vocabulary Search menu and repainting the screen.

Question History

The Question History command is used to display a list of previously executed questions. Commands are provided for moving the cursor up and down this list and selecting a question from this list to be input into the edit buffer. This allows new questions to be derived from previous ones.

Document Selection

When a question has retrieved a list of documents, they are numbered and displayed on the Document Selection screen. The commands in this module involve moving the cursor through the list of articles, reading a selected article, examining the vocabulary list or returning to Question Input mode.

Document Reader

When a document is selected for reading, the Document Reader module is initialized and the full text of the citation is shown on the screen. Available commands include commands to move the cursor around within the citation and between citations, return to the document list, search the citation for query terms, return to Question Input mode, examine the vocabulary list, and remove and enter comments.

Comment Input

When you have requested to comment on a citation, you are put into Comment Input mode. When entering a comment, do not type RETURN until the comment is complete. Words at the ends of lines will automatically be wrapped, and the system does not support entering multiple paragraphs of text. As soon as you type RETURN, you will be asked to enter a rating. Only numerals will be accepted as input, and the system will keep prompting until it receives valid input. You will be given the option to not log the comment. You will also be given the option of exiting the system entirely at this point. The comments entered will be moderated by the system administrator and be added to the information base once a week. Comments will appear in the citation and be credited to the user id of the person who created them.

Exit

The Document Reader, Document Selector and Utility Commands sections of the system support the Exit command. IRX and the login shell can be exited by typing ‘E’. The user is also offered the option of exiting the system after they have entered a comment. A ‘Ctrl-D’ will exit the system and login shell from any point in execution.

Any questions, comments or bug reports should be sent via e-mail to pptb@cme.nist.gov.

Policies and Procedures

Citation Submission

Citations may be submitted via e-mail to pptb@cme.nist.gov. All mail to this account will be moderated by a system administrator. New citation submissions should be complete and correct. A description of policies regarding inclusion of new citations follows in the next section. The following is the Process Planning Testbed's official format for the on-line database. This is the preferred format for citation submission, but other formats can be converted by NIST PPTB staff if arrangements are made. The most common key-letters and their meanings are given below. These are the addbib* defaults, with the few PPTB-specific changes marked by boldface type.

%A Author's name
%B Book containing article referenced
%C City (place of publication)
%D Date of publication
%E Editor of book containing article referenced
%G **Hardcopy number** (assigned by PPTB system administrator)
%I Issuer (publisher)
%J Journal containing article
%K Keywords to use in locating reference
%M **Author's institution**
%N Number within volume
%O **Rating and opinions on work**
%P Page number(s)
%R Report, paper, or thesis (unpublished)
%S Series title
%T Title of article or book
%V Volume number
%X **Abstract or objective description of work**

Except for the %A field, each field should be given just once. Only relevant fields should be supplied. The %G field should be omitted as it will be assigned by the system administrator.

EXAMPLE 1:

%A C. Sakamoto
%A S. Kado
%A M. Miyamatsu
%A Y. Miyamoto
%A N. Kojima
%T POPULAR - An Automatic Process Planning System

* addbib is a unix command for creating or extending a bibliographic database. These defaults correspond to SunOS 4.1 dated 21 December 1987.

%J Proceedings of the 19th CIRP International Seminar on Manufacturing Systems

%P 105 - 110

%C Pennsylvania State University

%D June 1987

%K generative Japan

%M Komatsu Ltd. Japan

%O 5

%X A generative planning system called POPULAR, standing for Process and Operation Planning system based on User LAnguage and Resource. Early stages, such as selection of shop and machines, are manual. Later stages, which they call "operation planning" are automated. These include choice of operations, sequence, tools, cutting conditions and NC code generation. It appears to handle collision checking between the tool and the workpiece.

EXAMPLE 2:

%A E. Passler

%A G.K. Hutchinson

%A K. Rudolph

%A W. Stanek

%T Production System Design: A Directed Graph Approach

%J Journal of Manufacturing Systems

%V 2

%N 2

%P 107-116

%K Directed Graphs, Production Systems, Simulation, Analysis

%O 6

%X This paper describes the use of directed graphs as a useful means of specifying production problem relationships for both analysis and simulation.

When a new citation is submitted, we are requesting that the submitter include an abstract or an objective description of the work in the %X field. This description should contain the following information:

- type of paper--survey, research report, magazine article, etc.
- subject matter
- scope
- conclusions
- relevance or relationship to other work, if known

We are also requesting that the submitter rate the paper in the %O field. For a description of score ranges, see the section on Scoring. This field should also be used to provide subjective comments on the work.

Citation Inclusion

Newly submitted citations will be reviewed by the PPTB project staff before inclusion in the information base. An effort will be made at this time to avoid duplicate entries in the information base and to screen submissions for out of scope articles. For a citation to be included in the on-line information base it must:

- be relevant to the process planning world. Methods, languages, tools, etc. are considered in scope.
- be unique; duplicate submissions will be included only once, all comments will be appended to the original citation.
- be available to the general public. This includes articles published in journals, conference proceedings, technical reports through universities, companies, etc. but that are available upon request from the outside world. Drafts of papers that have not yet been published are not acceptable. Presentation materials are not acceptable, unless they have been published in one of the previously listed types of documents. Theses are acceptable.

Because this is a database populated by users, there will naturally be some inconsistencies in style. New citations will be added by the system administrator once a week. Any changes that need to be made to an existing citation should be e-mailed to pptb@cme.nist.gov.

Commenting

If one is the first commentor on an article, we are requesting that the comment include the information described under Policies for Citation Submission, namely paper type, subject matter, scope, conclusions, relevance or relationship to other work, if known. This comment could be an abstract or an objective description of the work.

Opinions should be expressed in subsequent comments. Comments will be credited to the author's user-id and will therefore be anonymous. New comments will be appended to the citation after being reviewed for appropriateness by PPTB staff. This will be done once a week. Currently, the system enforces no restriction on the number of comments an individual can submit on a given article. This will be resolved in a later version of the system.

On-line editing of comments is not supported. To alter a comment, it must first be removed, then resubmitted.

Scoring

Scores or ratings of documents can be entered at the same time comments are entered. These scores will be averaged and recorded in the information base by the system administrator once a week. The scale for scoring ranges from 0-9, with 9 being exceptional and 0 being marginal. The following is a brief description of the scores and what they are intended to represent. A citation that is submitted with no score will receive a default score of zero.

0	Poor work; should not have been published
1-2	Not original work; little redeeming value
3-4	Reasonable work; not terribly new or archival
5-6	Good work
7-8	Very good research; worth reading
9	Outstanding work; seminal paper

Hardcopy Distribution Service

Hardcopies of documents cited in this information base will be available through the hardcopy distribution service at some future point. In support of this service, users will be requested to mail in paper or electronic copies in addition to the citation information.