Constructing the Web

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Abstract

One of the significant questions raised by personal construct psychology is the relationship between individual and social constructions. How does the personal freedom to construe become directed by interaction with others? This is relevant to the understanding of personal construct psychology in the scientific community at large. How do we introduce Kelly's ideas to others and provide constructive alternatives to other, more rigid, formal and informal psychologies?

The World-Wide Web is a widely accessible system for discourse on the Internet. It was developed in 1990 as an information retrieval system, but in 1993 2-way interaction was added, and the web grew rapidly to become the foundation of scientific discourse on the information highway. For PCP the web offers the opportunity to disseminate high-quality presentations of our research incorporating typographic-quality text, colored diagrams and pictures, sounds and movies. The 2-way interaction allows us to offer access to PCP tools and techniques such as repertory grid elicitation and analysis.

This paper describes the way in which NAPCN is using the web to disseminate knowledge about PCP to the psychological community at large, and explains the process of making material accessible on the web. It illustrates the use of the 2-way interactive capabilities to give anyone on the web free access to elicitation, analysis and comparison of repertory grids through WebGrid, our World-Wide Web PCP software.

In conclusion, there are major new opportunities for PCP knowledge dissemination and research through World-Wide Web. The PCP community can offer access to its research, techniques and tools, both within the community and to the world at large. In particular, tools can be made available as extensible services that can be used by other researchers as part of their own systems. This provides new opportunities for world-wide collaborative research in personal construct psychology.

Notes on The PCP Web Page

The address of the PCP site here is:
http://ksi.cpsc.ucalgary.ca/PCP

It has:-

- A brief introduction to PCP (largely Kelly quotes)
- A link from the intro to an HTML version of the paper on Kelly's Psychological Geometry that was written for "New Psychologist". This attempted to place Kelly historically in the growth of cognitive science and show how his geometry is equivalent to the intensional logics used in knowledge representation. It has a good set of refs for a newcomer.

- A note on David Nightingale's PCP list server with details of how to join, and hypertext links to the mail archives. We have hypertext indexed the PCP mail archives and linked these to the home page. They are grouped by quarter and indexed by thread, date, subject and author.
- A link to other PCP-related web sites. It requests url's for other sites.
- A link to PCP ftp and gopher sites. This currently has links to archives of Gaines/Shaw and Boose/Bradshaw papers. It again requests url's for other sites.
- A note on NAPCN and how to join.
- A note on EPCA and how to join.
- A note on the Barcelona meeting.
- Contents of JCP as posted by Bob Neimeyer.
- Links to information on how to set up and run a web site.
- Links to web sites at Stanford, Hanover and Carleton which keep track of psychology-related material and sites.
- The psychology resource sites have also entered links to the PCP page so that it is readily accessible to anyone searching for related material.
- We asked several groups maintaining indices of psychological activities on the Web to put in links to the PCP page here so that other psychologists world-wide could find it.
- We also put in links to the index pages at other sites so that someone coming into the PCP page could find other psychological material.
- There is also a link to WebGrid, a repertory grid elicitation, modeling and comparison service operating on the web. This is an implementation of RepGrid operating as an HTTP server on the web. You go through a normal elicitation based on triads, breaking matches, and so on, and get the FOCUS, PrinCom and Socio analyses back as graphics.

  All the grid data is stored in the web documents, so that you can save them on your own computer, use the data locally, and continue the elicitation and processing by reloading the locally stored file. You can annotate elements with HTML text so that comments, images and sounds can be used in the elicitation. These can be stored on your local machine or anywhere on the Internet.

  We have been running WebGrid for courses here this semester on a rather slow old Mac that no-one wanted, but we have now moved it to a sparkling new Power Mac that should be capable of supporting general use.

Information on RepGrid is available from:
Centre for Person-Computer Studies
3019 Underhill Drive NW
Calgary, Alberta
Canada T2N 4E4
☎ (403) 289 2986

Setting Up Web Sites

For those setting up web sites for the first time, Brian Gaines wrote a long 'how to' paper on supporting scientific communities on the Internet for a multimedia conference. It has all the details on formats, conversions, tools, what not to do, etc. It is on the KSI ftp site in Word RTF and PostScript formats:

ftp://ksi.cpsc.ucalgary.ca/KSI/RTF/CMMC94.RTF.Z
ftp://ksi.cpsc.ucalgary.ca/KSI/ps/CMMC94.ps.Z

This paper also addresses the issue of putting up interactive programs in the client-server environment of the web. It is simply done. However, the current interface available through HTML level 2 forms is very restrictive.

We are designing the systems such that they can be used by other programs as services, as well as by end users. This is an exciting aspect of the open client-server environment that the web offers. It supports world-wide collaborative research. For example, one group can put up an analysis program, e.g. a principal component agent, and another group can put up an elicitation system that uses that agent for analysis. There is tremendous scope for loosely-coupled community research.

Accessing the Web

We've had a number of requests for info on how to access World-Wide Web. It's not as simple as email because you need a higher-quality connection to the Internet that gives you reasonable speed TCP/IP access. If you are coming in over a modem, this means a 14,400 baud modem through a PPP or SLIP connection. The speed is important because the web supports images and these tend to be larger data structures than text.

The browser to use currently is Netscape from Netscape Corporation. It is available for Macs, PCs and Unix systems, and is used by over 80% of WWW users. It is free for educational and personal use, and $39 for other use. The ftp site are:

ftp.netscape.com
ftp2.netscape.com

Electronic Journals and Publication On The Internet

There is increasing publication on the Internet, and a growing number of electronic journals. Universal access is still a problem, and the best solution currently seems to be dual publication with the electronic version free and the paper version low in cost. JAIR, the Journal of Artificial Intelligence Research from Morgan Kauffman is a good example with strong refereeing, rapid publication, free Internet access and a paper version at $39 a year.

However, increasingly also authors are just bypassing the current systems and putting their work up for access through ftp and WWW. It is fast and simple, reaches a large population, and allows multi-media materials, simulations, access to raw data, and so on, to be incorporated.

The nice thing about WWW is that is very open and egalitarian. We don't intend this to be THE PCP page but rather one of many, all cross-linked. Any PCP group can put up material on the Internet which reflects its own approach and applications.

So, the next step is for everyone to send us the url's of any material they have up so that this page can be linked to others.

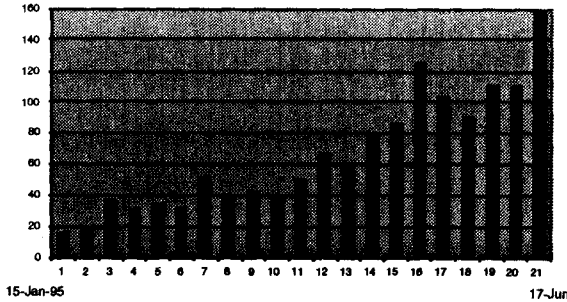
In the short term, those who do not yet have web sites can send us a note of any organizations or meetings that should be added to this page. We can also add papers in electronic format to the archive (we have already done this for the Boose/Bradshaw material sent to us by John Boose).

The simplest way to send electronic material is to ftp it to
ftp://ksi.cpsc.ucalgary.ca/incoming
and mail one of us that it is there and should be put into the archives)

In the long term, it is best if as many groups as possible maintain their own WWW/ftp/gopher sites. The Internet is a nice arena in which to publish what you like with no heavy hand of publishing bureaucracies!

PCP Web Server Statistics

http://ksi.cpsc.ucalgary.ca/PCP

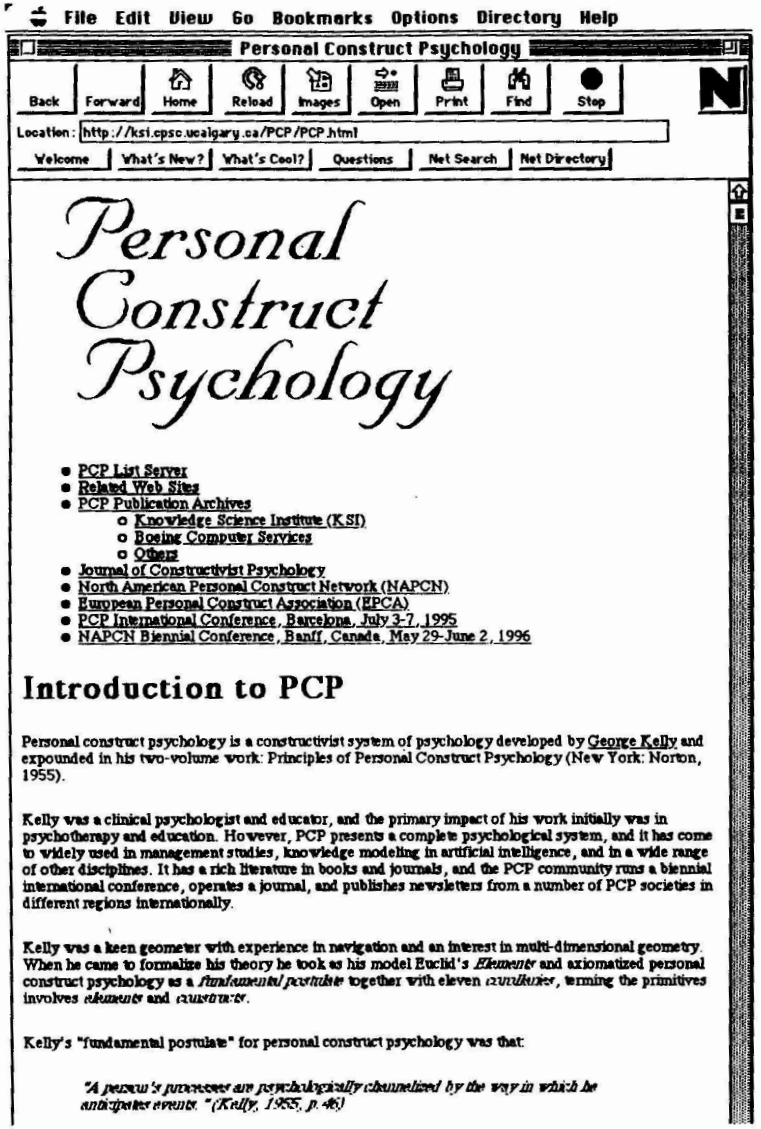


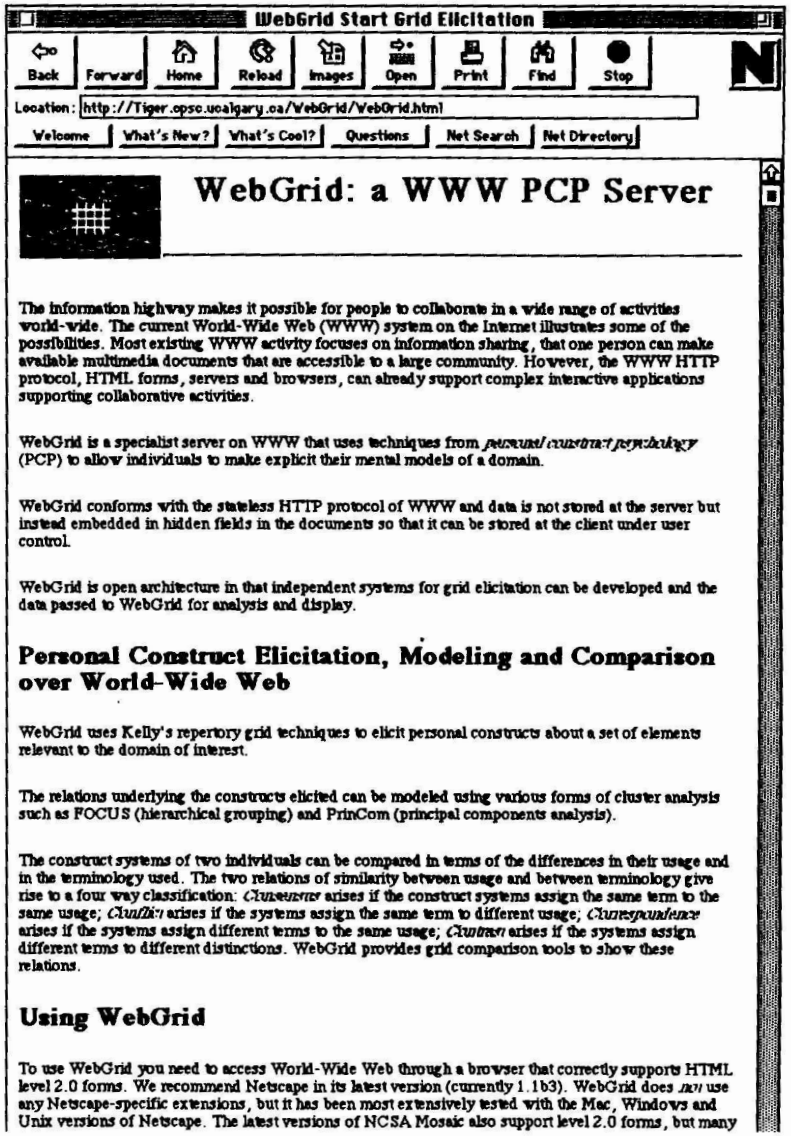
Accesses/week by different sites

1046 different machine addresses from 34 different countries accessed PCP home page over initial 5 month period

543	USA
58	Canada
58	UK
46	Australia
24	Germany
15	Finland
12	Holland
10	Japan
10	Norway
9	Switzerland
6	Austria
6	Sweden
5	Israel
5	Mexico
3	Belgium
3	Spain
3	South Africa
2	Columbia
2	Denmark
2	Italy
2	Singapore
1	Brazil
1	Chile
1	Costa Rica
1	Czechoslovakia
1	Greece
1	Hong Kong
1	Ireland
1	Iceland
1	New Zealand
1	Russian Federation
1	Soviet Union
1	Thailand
1	Turkey
209	number only
1046	**Total**

Some web pages are shown in the rest of the notes


File Edit View Go Bookmarks Options Directory Help
Personal Construct Psychology
Back Forward Home Reload Images Open Print Find Stop
Location: http://ksi.cpsc.ucalgary.ca/PCP/PCP.html
Welcome What's New? What's Cool? Questions Net Search Net Directory
Personal Construct Psychology
PCP List Server
Related Web Sites
PCP Publication Archives
Knowledge Science Institute (KSI)
Boeing Computer Services
Others
Journal of Constructivist Psychology
North American Personal Construct Network (NAPCN)
European Personal Construct Association (EPCA)
PCP International Conference, Barcelona, July 3-7, 1995
NAPCN Biennial Conference, Banff, Canada, May 29-June 2, 1996
Introduction to PCP
Personal construct psychology is a constructivist system of psychology developed by George Kelly and expounded in his two-volume work: Principles of Personal Construct Psychology (New York: Norton, 1955).
Kelly was a clinical psychologist and educator, and the primary impact of his work initially was in psychotherapy and education. However, PCP presents a complete psychological system, and it has come to widely used in management studies, knowledge modeling in artificial intelligence, and in a wide range of other disciplines. It has a rich literature in books and journals, and the PCP community runs a biennial international conference, operates a journal, and publishes newsletters from a number of PCP societies in different regions internationally.
Kelly was a keen geometer with experience in navigation and an interest in multi-dimensional geometry. When he came to formalize his theory he took as his model Euclid's Elements and axiomatized personal construct psychology as a fundamental postulate together with eleven corollaries, terming the primitives involves elements and constructs.
Kelly's "fundamental postulate" for personal construct psychology was that:
"A person's processes are psychologically channelized by the way in which he anticipates events." (Kelly, 1955, p. 46)


WebGrid Start Grid Elicitation
Back Forward Home Reload Images Open Print Find Stop
Location: http://Tiger.cpsc.ucalgary.ca/WebGrid/WebGrid.html
Welcome What's New? What's Cool? Questions Net Search Net Directory
WebGrid: a WWW PCP Server
The information highway makes it possible for people to collaborate in a wide range of activities world-wide. The current World-Wide Web (WWW) system on the Internet illustrates some of the possibilities. Most existing WWW activity focuses on information sharing, that one person can make available multimedia documents that are accessible to a large community. However, the WWW HTTP protocol, HTML forms, servers and browsers, can already support complex interactive applications supporting collaborative activities.
WebGrid is a specialist server on WWW that uses techniques from personal construct psychology (PCP) to allow individuals to make explicit their mental models of a domain.
WebGrid conforms with the stateless HTTP protocol of WWW and data is not stored at the server but instead embedded in hidden fields in the documents so that it can be stored at the client under user control.
WebGrid is open architecture in that independent systems for grid elicitation can be developed and the data passed to WebGrid for analysis and display.
Personal Construct Elicitation, Modeling and Comparison over World-Wide Web
WebGrid uses Kelly's repertory grid techniques to elicit personal constructs about a set of elements relevant to the domain of interest.
The relations underlying the constructs elicited can be modeled using various forms of cluster analysis such as FOCUS (hierarchical grouping) and PrinCom (principal components analysis).
The construct systems of two individuals can be compared in terms of the differences in their usage and in the terminology used. The two relations of similarity between usage and between terminology give rise to a four way classification: Consensus arises if the construct systems assign the same term to the same usage; Conflict arises if the systems assign the same term to different usage; Correspondence arises if the systems assign different terms to the same usage; Contrast arises if the systems assign different terms to different distinctions. WebGrid provides grid comparison tools to show these relations.
Using WebGrid
To use WebGrid you need to access World-Wide Web through a browser that correctly supports HTML level 2.0 forms. We recommend Netscape in its latest version (currently 1.1b3). WebGrid does not use any Netscape-specific extensions, but it has been most extensively tested with the Mac, Windows and Unix versions of Netscape. The latest versions of NCSA Mosaic also support level 2.0 forms, but many

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You can link to WebGrid from this document, starting a new grid, preloading a sample grid, or doing exchange grids on various topics.

Starting a New Grid

You will be asked to define your domain, purpose, terms for elements and constructs, rating scale range, and some initial elements. WebGrid will then take you direct to an initial triadic construct elicitation, and thence to a status screen offering various options.

Click here to start a new grid

Examine Existing Grids

Click here to access a grid on personnel selection

Click here to access a grid on manufacturing systems

An Educational Application

WebGrid has been used this semester with students in CPSC547, a course on advanced information systems. The notes for this course are on the web, as are student projects, and a WebGrid project involving exchange grids.

Click here to to access the 547 course notes

Click here to to access the 547 WebGrid project

A Real Estate Application

WebGrid takes full advantage of the multi-media capabilities of World-Wide Web. Elements can be annotated with HTML statements, including links to pictures and sounds, as well as typographic text. This annotation is used to present pictures, diagrams, sounds and textual notes to facilitate triadic elicitation and breaking element matches.

Because the pictures, etc, are accessed through a URL, they can be stored anywhere on the web or on the local client disk.

Click here to to access a house purchase decision demonstration

Collaborative Learning

One of the reasons for developing WebGrid was to take advantage of World-Wide Web's capability to support distributed collaborative activities. The attached article describes WebGrid in use in a collaborative learning situation.

Implementation

WebGrid is a port of RepGrid to operate as a service over World-Wide Web (WWW). Part of its functionality is an interface to RepGrid through the HTTP common gateway interface to MacHTTP.

Other significant parts are a dialog generator that replaces the graphic user interface to RepGrid on personal computers with dynamically generated HTML forms accessible through WWW browsers, and a high-speed PICT-to-GIF converter that supports the transmission across the web of the graphic output from RepGrid analyses.

Grids are embedded in WebGrid documents using HTML hidden fields. The format is simple and easy to decode so that other applications can use the data collected.

The server url is also embedded in the documents so that they can be saved in HTML format at the client machine in such a way that, when they reloaded as files, interaction with the server can continue.

Such grids can also be made available on WWW for others to view, analyze, exchange with, and otherwise interact with.

This makes the repertory grid an available active document type for publication on World-Wide Web.

Developments

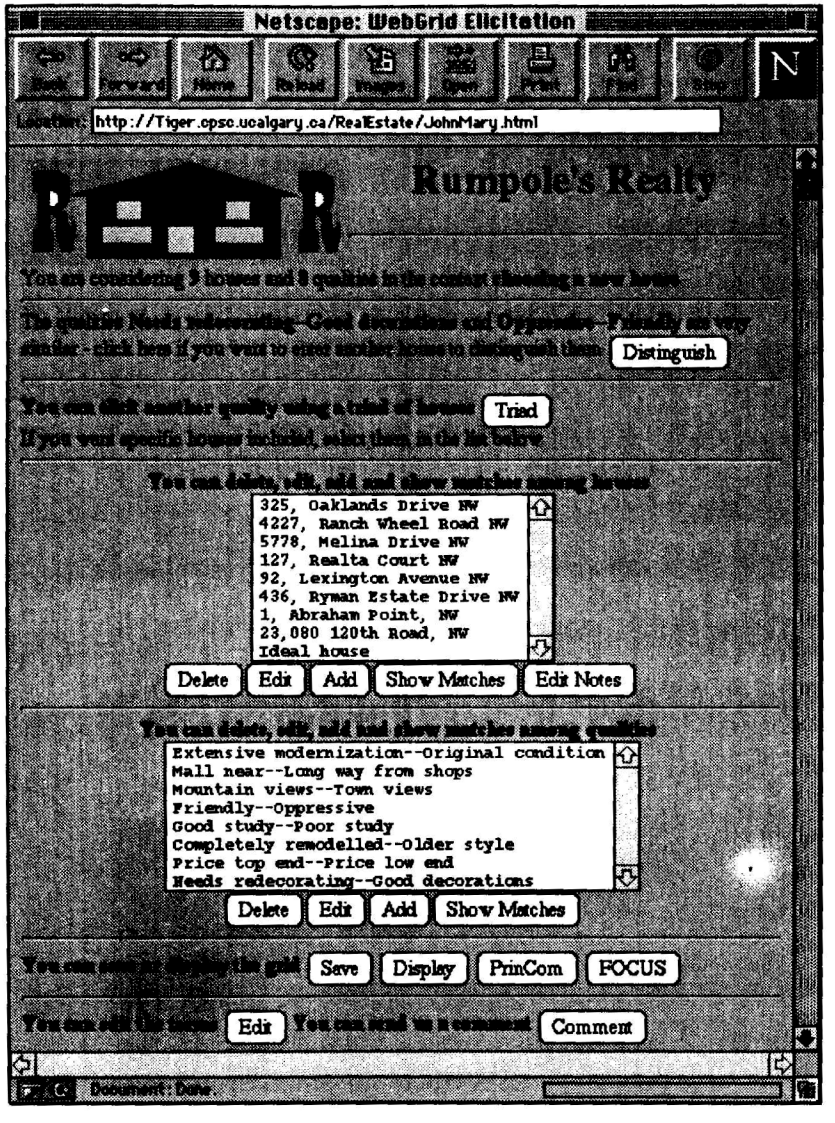
The RepGrid implementation used has the extended data type capabilities that we have developed for knowledge-based systems. The underlying knowledge representation system can represent not only rating scales, but also categorical, numeric and relational data. We will be extending the WWW interface to make these facilities available also.

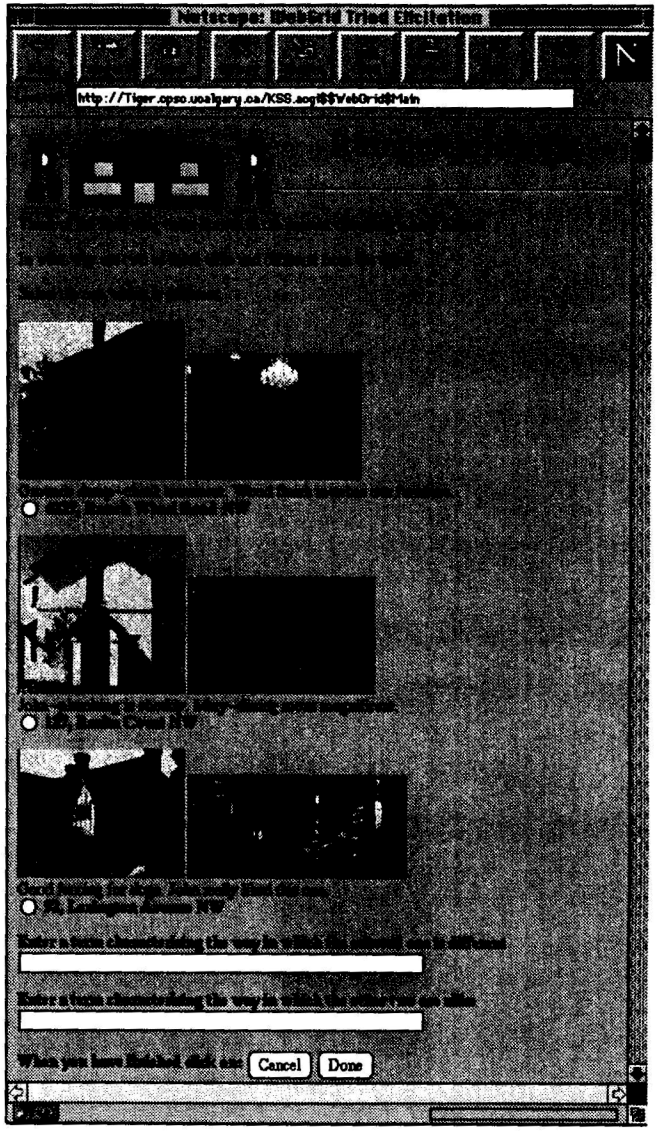
The other analysis tools such as Induct for inductive modeling are also available and will be made accessible once an interface to the full range of data types has been implemented.

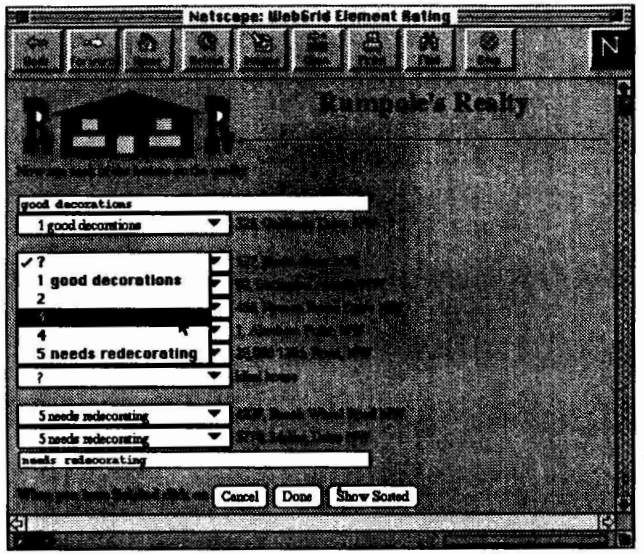
The KRS inference engine is also part of the server, and it will be possible to load the knowledge structures developed into KRS and run them as an operational knowledge base or expert system.

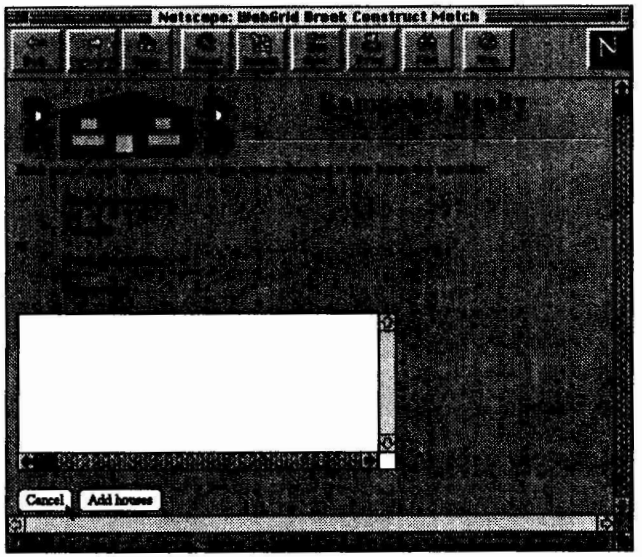
Our short-term objective is to make a full knowledge acquisition and modeling system available through World-Wide Web, from informal representation through hypermedia, through structured elicitation, inductive modeling, to operational knowledge-based systems.

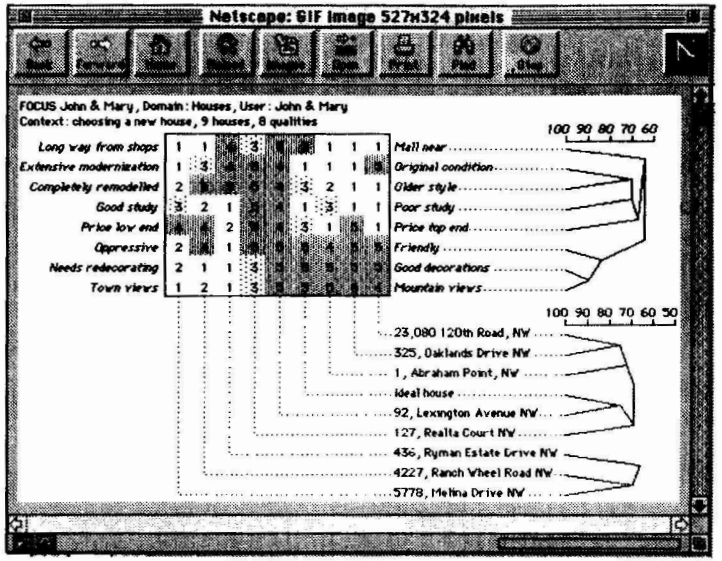
Our medium-term objective is to make these facilities available to support the collaborative processes of all forms of learning community.

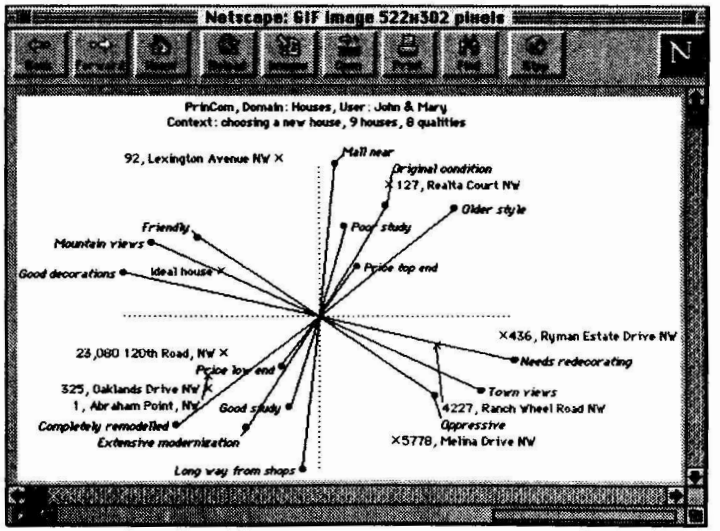

Netscape: WebGrid Elicitation
Back
Forward
Home
Reload
Images
Open
Print
Find
Stop
Location: http://Tiger.cpsc.ucalgary.ca/RealEstate/JohnMary.html
Rumpole's Realty
Distinguish
Triad
325, Oaklands Drive NW
4227, Ranch Wheel Road NW
5778, Melina Drive NW
127, Realta Court NW
92, Lexington Avenue NW
436, Ryman Estate Drive NW
1, Abraham Point, NW
23,080 120th Road, NW
Ideal house
Delete
Edit
Add
Show Matches
Edit Notes
Extensive modernization--Original condition
Mall near--Long way from shops
Mountain views--Town views
Friendly--Oppressive
Good study--Poor study
Completely remodelled--Older style
Price top end--Price low end
Needs redecorating--Good decorations
Delete
Edit
Add
Show Matches
Save
Display
PrinCom
FOCUS
Edit
Comment
Document: Done


Netscape: WebGrid Triad Elicitation
http://Tiger.cpsc.ucalgary.ca/KSS.acgi$$WebGrid$Main
Cancel
Done


Netscape: WebGrid Element Rating
Rumpole's Realty
good decorations
1 good decorations
✓?
1 good decorations
2
4
5 needs redecorating
?
5 needs redecorating
5 needs redecorating
needs redecorating
Cancel
Done
Show Sorted


Netscape: WebGrid Brook Construct Match
Cancel
Add houses


Netscape: GIF image 527x324 pixels
FOCUS John & Mary, Domain: Houses, User: John & Mary
Context: choosing a new house, 9 houses, 8 qualities
100 90 80 70 60
Long way from shops
Extensive modernization
Completely remodelled
Good study
Price low end
Oppressive
Needs redecorating
Town views
Mall near
Original condition
Older style
Poor study
Price top end
Friendly
Good decorations
Mountain views
100 90 80 70 60 50
23,080 120th Road, NW
325, Oaklands Drive NW
1, Abraham Point, NW
Ideal house
92, Lexington Avenue NW
127, Realta Court NW
436, Ryman Estate Drive NW
4227, Ranch Wheel Road NW
5778, Melina Drive NW


Netscape: GIF image 522x302 pixels
PrinCom, Domain: Houses, User: John & Mary
Context: choosing a new house, 9 houses, 8 qualities
92, Lexington Avenue NW
Mall near
Original condition
127, Realta Court NW
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Friendly
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