APPENDIX 1: IV USABILITY EVALUATION GUIDELINES

This checklist was developed using various resources (Brath, 1997a; 1997b; 1999; Freitas, et al., 2004; Neilsen, 1994; Pierotti, 1995) and also our project findings.

Visual Representation

1.	The site is uncluttered
2.	There is sufficient white space on the pages
3.	The size of the display is adequate
4.	The amount of information presented on the page is digestible (before any user action)
5.	The amount of information presented on the page is digestible (after changing settings)
6.	The layout is logical
7.	It is easy to find information
8.	All data elements are visible
9.	It is easy to access the data elements
10.	Related items are grouped together
11.	Colour is effectively used to represent different variables of data
12.	Colour is used to aid the visual representation of the data
13.	The number of different data dimensions that appear on the visualisation simultaneously are easy to understand/interpret (e.g. price, interest rates, annual income)
14.	The visualisation is not disorienting
15.	As this visualisation is effective in describing itself little/no further explanation is needed.
16.	The most appropriate form of visualisation has been used to display the information.

Navigation and Interaction

17.	It is easy to select the data elements
18.	It is easy to deselect data elements

19. There is visual feedback when data elements are selected or moved
20. There is visual feedback in menus or dialogs boxes about which choices are selectable
21. Where multiple options can be selected in a menu or dialog box, there is visual feedback about which options are already selected.
22. A single icon is clearly visible when surrounded by unselected icons
23. Specific data can be searched or queried
24. Zooming into the data set shows more graphical details
25. Zooming in and out of the data is simple
26. The context is always maintained when zooming in/out and/or when searching/querying the data
27. It is easy to change/refine the search/query criteria
28. It is possible to return to the original dataset
29. Data can be removed from the display
30. Additional data can be easily added to the display
31. Drilling down to the underlying data is easy
32. The visualisation makes use of legends, scales and/or annotations to assist the user in deciphering the information

User control and freedom

33. The number of different data dimensions that appear on the visualisation simultaneously can be controlled by the user (e.g. price, interest rates, annual income)
34. It is possible to cancel an action
35. It is possible to undo an action
36. It is possible to redo an action
37. Information is provided on the path that is followed whilst navigating the site (e.g. like a breadcrumb trail)

Content quality

38. An overview of the entire data collection is available.
39. It is easy to understand what the data represents.
40. The information is understandable.
41. The visualisation reveals insight into the data.
42. It is possible to make a decision based on the information.

APPENDIX 2: SUMMARIES OF INTERVIEWS

Summary of Interview with Professor Spence

Question 1

What do you think is the role of IV for digital information resources, in particular in terms of i) user interface for digital libraries, ii) learning and teaching, iii) e-learning, and iv) in enhancing the usability?

To support the many sub-tasks involved in a huge variety of tasks

1) give overview
2) support exploration to form a mental model (discovery, trade-offs etc)
3) support navigation, partly based on mental, either to enhance the model or to move to a target
4) support the formulation of a problem
5) support zooming/drilling down into parts of the information space
6) allow interpretation of data, comparisons etc.

Question 2

Are there any specific IV techniques/tools that you would recommend for digital libraries applications (such as portals, digital image databases, geo special, multimedia, bibliographic tools) among all the existing techniques developed (and which do you think are not that suitable for digital libraries)? How successful are these techniques? And are there any reported studies evaluated then?

Suggested techniques:

- Browsing is an important task: Rapid Serial Visualization Presentation (RSVP) or mixed mode
- Hierarchical exploration tools (hyperbolic browser)
- Qualitative encoding
- IV for modifiable queries
- IV Query, presentation: focus + context
- Zoom +panning
- Suggest to use in specifying a query, to explore the space and time

- For portals
    - visual graphical way of specify a query, present graphically for bio-medical information
- For Geo-spatial,

    - zoom & pane, panning the automatic zooming
    - distortion (map distortion)
    - magic lens
    - RSVP
- Bibliographic database
    - Images
    - Tile bars

Not many comparative studies at the moment because:
- complex applications
- multi-technique used
- often not designed by domain experts

Not suitable for DL (perhaps) – Co-ordinate plots

Question 3

With references to the RSVP presentation technique that you presented in your tutorial, what is your recommendation towards implementing this technique into the domain of DL? JISC? Which specific RSVP mode(s) will be most applicable from your view?

- Need to explore which RSVP mode will be most applicable to DL
- Suggestion – Floating RSVP
- some suggested ideas: Eye-gaze is crucial

Question 4

When designing an application that applies the IV techniques/tools into the design, is there any existing taxonomy of IV that could guide the design process? Are there any special set of rules or guidelines that will assist in the selection of suitable techniques and tools for a particular domain or presentation medium (e.g. images, multimedia, text)?

- Design very complex
- Most important: to understand the task

Question 5 – Disabilities

Nowadays, most digital libraries tend to move towards web-based applications making them more easily accessible by the general public, and as the DDA legislature will

become effective in the UK in 2004, how can we accommodate IV so that people with disabilities (e.g visually impaired, people with different spatial abilities) in particular could also enjoy and share the benefits and experience of visualisation.

- Spence view: Visualisation is not limited by vision. Can be visualising by sound.
- For the blind, how do blind people form a mental model?
- For visually impaired, apply colour blind rules?
- Spatial abilities – what do we know about this area for the moment?

Question 6 – Future

What do you see are the future directions of IV and especially when it comes to DL ?

- Navigation improvement
- Human guidance of automnomous processes (i.e. automated search) (see chap 9 on Spence book)
- Opportunistic Browsing
- Framworks for design
- Agent support

Question 7

Are there any other resources that you can point me to which will assist me in my research?

- important to define your research
- IV conference proceedings – e.g. InfoVis, IV03
- Information design journal
- Jakob Neilsen book – the 50 examples

Summary of Interview with Dr. Mike Pringle (VADS)

Question 1

What do you think is the role of IV for digital information resources, in particular in terms of i) user interface for digital libraries, ii) learning and teaching, iii) e-learning, and iv) in enhancing the usability?

Current Issues with IV:

- How to sort information itself
- Accessible and visual

- Rather than finding shortcuts for the developer/the information online needs be presented better. Make the developer work than making the user work on figuring out how to use the interface.

- If you cannot explain to the user from the very outset what the application could do with them then they simply wouldn't use it.

- High level filtering – one that users would have will control over (perhaps a personalisation)

- Lightbox (feature in VADS) for example, is not particularly useful and it doesn't address all user needs.

- KartOO, for example,
  - is no different than browsing a linear tree;
  - it doesn't help users to search if users are not used to that metaphor, this will hinder usage.
  - the circles attached with strings doesn't mean anything

- Allison Druin From HCIL – International Childrens digital library is a good example in applying IV

Functional application for digital libraries:

- Comparison to books
- Ordering with results
- Bridging gap between user and information

IV towards the bottom-up approach

- manipulating dynamic methods
- advance code
- abstract algorithms
    - need more work instead of short cut
    - provide metaphor
    - Need to address the issue of “developing better things to develop things for users”

    “customers we like to accompany, put them first”

<u>Question 2</u>

Are there any specific IV techniques/tools that you would recommend for digital libraries applications (such as portals, digital image databases, geo special, multimedia, bibliographic tools) among all the existing techniques developed (and which do you think are not that suitable for digital libraries)? How successful are these techniques? And are there any reported studies evaluated then?

IV techniques applicable in digital libraries

- Don’t think hyperbolic tools applicable. hyperbolic trees is too complex for general users:
    - impossible to find information
    - complex relationship
- Zooming in/out
- Use of icon/images to express information

<u>Question 3</u>

Nowadays, most digital libraries tend to move towards web-based applications making them more easily accessible by the general public, and as the DDA legislature will become effective in the UK in 2004, how can we accommodate IV so that people with disabilities (e.g visually impaired, people with different spatial abilities) in particular could also enjoy and share the benefits and experience of visualisation.

- simply keep it (the interface) simple

<u>Question 4</u>

What do you see are the future directions of IV and especially when it comes to DL (and to JISC)?

Search by content (metadata)

1) Search

- Image
- GETTY (metadata standard) standard still under debate
- Thesaurus

2) User centred
    - Define who users are? And what they use?
    - Keep it simple
        - 3 or 4 entry points
        - 4 simple choices
        - Choices are simple and clear
    - It is important to filter the user, not the information

- Dr Pringle's Mantra:
    - "Filtering users as opposed to filtering information"
    - "Developing technology that works for users"
    - "It's about developing technology that users will use"

- Use icon and graphs – especially helpful for children

Information fashionism

- Only goes to images bank if he knows that people uses that
- Only goes to images bank if like-minded people use these

Ideal image bank digital library

- Similar to Google, simple word in simple search
- Amazon relationship

Digital Libraries for IV need to take these into considerations:

- Use of English: for example, plurals
- More choices to see and search for information
- Exploring information visualisations
- Expression should try to be in image based ways
- Visual way
- How do you search when keywords are not apparent? i.e. I have a furry four legged animal and if it keeps looking for a dog, by keyword search (furry four legged animal), result generated would not appear to be a dog.

Suggestions for JISC

- Thought to be for the ICT development, to promote to developers not to users
- Technology seems to be overruling the web for the moment, not what users want
- All JISC services need to focus, to figure out what we DO NOT want
- And to turn the entire focus round to focus on users
- JISC needs to focus on user needs.

APPENDIX 4: PARTICIPATORY DESIGN DOCUMENTS

CONSENT FORM

I acknowledge that I have been asked to participate in a participatory design study by City University.

By signing below, I agree and consent to participate in the participatory design study and allow the City University representative (and observers) to observe, record my comments, actions and observations.

I also give permission for the City University representative to video record and to take photos of me whilst I take part in group exercises, and possibly use the video during presentations to other project members and at selected conferences. I understand that the results of the study may be submitted to publications such as academic journals and conference papers.

I understand that I will be compensated in the amount of _____ regardless of whether I am able to complete the study or not and that I am free to withdraw myself from the study at any time should I feel that to be necessary.

You can complain about the study if you don't like something about it. To complain about the study, you need to phone 020 7040 8010. You can then ask to speak to the Secretary of the Ethics Committee and tell them that the name of the Project is *JISC Information Visualisation Foundation Study.* Or you can write to the Secretary:

Saran Simpson,
Secretary to Senate Ethical Committee,
Academic Registry,
City University,
Northampton Square,
London, EC1V OHB.

Print Name

Signature

Screening Questionnaire

Joint Information Systems Committee Information Visualisation Study

Questionnaire

Thank you for taking the time to fill-out this questionnaire, as part of the Joint Information Systems Committee Information Visualisation study. The purpose of this questionnaire is to help us understand your experience and background.

All the information you provide is confidential and will not be used for any other purpose.

Explanation of rating scales

Some questions ask you to choose between options. To specify your choice, simply type an '**X'** after the option you want. For example:

Question: Do you understand what information visualisation is?

Option 1: Yes.

Option 2: No.

Please answer the questions below.

1. What is your name?

2. How old are you?

   Option 1: Under 20.

   Option 2: Between 21 and 30.

   Option 2: Between 31 and 40.

   Option 3: Between 41 and 50.

   Option 4: Between 51 and 60.

   Option 5: Over 60.

3. What is your level of computer experience?

   Option 1: Not at all experienced.

   Option 2: Not very experienced.

   Option 3: Experienced.

Option 4: Quite experienced.

Option 5: Very experienced.

4. How many hours per week do you browse/use the World Wide Web?

   Option 1: Never use the web.

   Option 2: Between 1 and 5 hours per week.

   Option 3: Between 6 and 10 hours per week.

   Option 4: Between 11 and 20 hours per week.

   Option 5: More than 20 hours.

5. Which of the following web sites have you used in the last month? (You may select more than one)

   Option 1: Yahoo

   Option 2: MSN

   Option 3: BBC

   Option 4: Amazon

   Option 5: Excite

   Option 6: Other, please specify _____

6. Which of the following online mapping services have you used? (You may select more than one)

   Option 1: Streetmap

   Option 2: Multimap

   Option 3: MapQuest

   Option 4: Other, please specify_____

7. Which of the following services do you use to find resources for your research? (You may select more than one)

   Option 1: City University library catalogue

   Option 2: Online journals like ACM

   Option 4: British library catalogue

   Option 3: Other, please specify_____

8. Which of the following are you interested in? (You may select more than one)

   Option 1: Digital photography

   Option 2: Digital imagery

   Option 4: Art

Option 4: None of the above

9. Do you have any knowledge of information visualisation?
   Option 1: Yes
   Option 2: No

10. Have you ever been involved in developing prototypes?
    Option 1: Yes
    Option 2: No

Thank you for taking the time to complete this questionnaire.