NoVA: Non-Visual Access to the Digital Library:
The use of Digital Library Interfaces by Blind and Visually Impaired People.

Annotated Bibliography

January 2001

Annotated bibliography of documents relevant to the **NoVA project**. Areas covered include web accessibility, human computer interaction, information seeking behaviour, both on a general level and relating to blind and visually impaired people.

Abels, E. G., M. D. White, et al. (1999). "A user-based design process for Web sites." OCLC Systems and Services, 15(1).
Reports on the second of a two-part project to identify and implement user-based criteria in web sites. A user based design process has been adopted which gathers user input at three stages of the four stage process. The four stages comprise information gathering, development, test and evaluation, implementation.

Astbrink, G. (1996). "Web page design: something for everyone." Link-up December, pp7-10.
Considers the main issues surrounding accessible web design and identifies some pitfalls. Covers the main areas where inaccessibility can occur eg. images, forms, tables etc. and provides solutions to accessibility problems. Paper was written in 1996 so some solutions may have changed slightly. For example, provision of one fully accessible version of a webpage is now the preferred option to a separate text-only version. Briefly mentions how producers of web browsers are being encouraged to incorporate more accessibility features and describes a browser developed by Deaking University which has built-in accessibility features for blind and visually impaired people.

Bergman, E. and E. Johnson (1995). Towards accessible human-computer interaction. In: J. Nielsen, Advances in human-computer interaction. vol.5. New Jersey: Ablex Publishing.
Recognises that despite a growing focus on user-centred interface design, the needs of users with disabilities are often overlooked. The paper defines accessibility and discusses accessibility design issues relating to a variety of disabilities including visual impairment. A list of guidelines is presented based on the design issues discussed in the paper. Future directions in the area of human-computer interaction are briefly covered - bearing in mind this paper was published in 1995 it might be interesting to compare these with current developments.

Berry, J. (1999). “Apart or apart?: access to the Internet by visually impaired and blind people, with particular emphasis on assistive enabling technology and user perceptions.” Information technology and disabilities, 6(3).
Report of a study on the perceptions and experiences of web use by blind and visually impaired people. Aims to determine the differences in use between blind and partially sighted users. Begins with a literature review covering different types of visual impairments, statistics relating to visual impairment and current legislation. Report then describes the study which used a sample of blind and partially blind students and staff with varied web experience who were interviewed about their experiences of accessing and using the web. Includes discussion of methodology and data collection.

Booth, P. (1989). An introduction to human-computer interaction. New Jersey: Lawrence Erlbaum Associates.

Borlund, P. and P. Ingwersen (1997). “The development of a method for the evaluation of interface information retrieval systems.” Journal of Documentation, 53(3), pp225-246.
Describes the 'simulated work task situation' method of evaluating information retrieval systems.

Boyd, L., G. Boyd, et al. (1990). “The graphical user interface: crisis, danger and opportunity.” Journal of visual impairment and blindness, December, pp.496-502.
Paper published in 1990 which identifies the 'potential new problems' posed by GUIs, for example accessibility issues for blind computer users. Goes on to describe strategies being developed to address the accessibility issue. May be a useful paper to compare with what is happening in 2000.

Brophy, P. and J. Craven (1999). The integrated accessible library: a model of service development for the 21st century. British Library Research and Innovation Report 168. Manchester: Centre for Research in Library and Information Management.

Burger, F. and B. Stoger (1996). Access to the WWW for Visually Impaired People using Browsing Tools based on GUI: State of the Art and Prospects. Proceedings of the 5th International Conference on Computers Helping People with Special Needs ICCHP '96 Linz, Austria.
Paper on the experiences of visually impaired people with accessing GUI-based web browsers. Describes some of the most common web browsers and identifies techniques to enable visually impaired people to access GUIs. Goes on to describe tests undertaken using GUI-based web browsers plus an overview of related work in this area.

Buultjens, M., S. Aitken, et al. (1999). “Size counts: the significance of size, font and style of print for readers with low vision sitting examinations.” British Journal of Visual Impairment, 17(1), pp.5-10.
Describes work commissioned by the RNIB to examine the effects of font, size and styles of print for visually impaired students undertaking examinations. Study tested a number of font sizes and styles on a sample of students who had moderate, severe and profound sight loss. Study concludes that Helvetica N24 plain text is the most generally acceptable font size and style.

Cantor, A. (1999). Escaping the mousetrap: an evaluation of the accessibility and usability of the windows keyboard-only interface. WWW8 Developers Day, Ontario.
Paper evaluates the accessibility and usability of keyboard-only access based on three key issues: is a keyboard-only interface accessible? is it useable? And finally, what must software designers know to be able to develop an accessible and usable keyboard-only interface?

Carey, K. (In Press). Joined up citizenship: a report for the Department of Trade and Industry on improving access to ICTs for people with disabilities, Department of Trade and Industry.

Carey, K. and R. Stringer (2000). The power of nine: a preliminary investigation into navigational strategies for the new library with special reference to disabled people, London: Library and Information Commission.
Detailed study into the way information is designed and located and how this will be critical to accessibility for all. Considers navigational strategies in general and then focuses on disability (including blindness and visual impairment), searching and navigation. The 'power of nine' is derived from the development of an information navigation model which has no more than nine links and has a maximum of nine levels - based on a phone-pad interface layout.

Casey, C. (1999). “Accessibility in the virtual library: creating equal opportunity web sites.” Information technology and libraries, March, pp.22-25.
Describes developments of the Web Accessibility Initiative (WAI) in creating guidelines for accessible websites which will comply with the American Disabilities Act (ADA).

Chalfen, D. H. and S. E. Farb (1996). “Universal access and the ADA: a disability access design specification for the new UCLA library online information system.” Library Hi Tech, 14,1(53).
Paper describes how the ADA influenced the provision of online information at UCLA library. Begins with an outline of the requirements of the ADA and then goes on to describe the UCLA online information system design. Includes the UCLA library disability specification.

Chen, C. C. and P. Hernon (1982). Information seeking: assessing and anticipating user needs. New York: Neal-Schuman.
Concentrates on the information-seeking individual as the basis for understanding and assessing individual information needs. Identifies physical barriers which are imposed when the individual is unable to "make contact with the appropriate information providers due to some physical consideration". For example, the absence of library stairs for the "handicapped individual" - this barrier to physical access would then have been a major consideration when providing access to information providers, ie. the librarian.

Chong, C. (1994). “Problems and challenges of the graphical user interface.” The braille monitor, January, pp52-56.
Paper discusses the challenge for developers of GUIs to enable access by blind and visually impaired people. Describes the development work of several organisations including IBM and Microsoft, as well as anti-discrimination work of organisations such as the Disability Action Committee for X, which is directed by Trace Center.

Choo, C. W., B. Detlor, et al. (1999). “Information seeking on the web: an integrated model of browsing and searching.” ASIS Annual Meeting Contributed Paper.
Report of a study of how workers use the web to search for information as part of their daily work. The study comprised detailed questionnaires and interviews, the use of WebTracker software to record users web activities, follow up interviews recalling critical incidents of using information from the web. A model was developed for the analysis of data based on the work of Ellis (model of seeking behaviour) and Anguilar (mode of scanning) - also draws on other research such as that of Marchionini.

Church, G. M. (1999). “The human-computer interface and information literacy: some basics and beyond.” Information technology and libraries, March, pp3-21.
Provides some basic aspects of HCI research starting with descriptions of Shannon-Weaver and Schramm models of communication - concludes that design should take into account the evaluation of user characteristics. Basic HCI components are described including some good examples of general tasks such as steering a boat and baking bread and how these can be mapped onto computer based tasks. Components include goals, intentions, psychological variables, physical state of the system and mechanisms that control the system.

Collins, J. (1994). Understanding the problems of being partially sighted, In: Looking ahead: a practical look at new developments in library and information services for visually impaired persons, VIP. VIP second

international study conference on library services to visually impaired persons 1994, Leicester: Ulverscroft.
Identifies the four main types of visual loss: total blindness, central vision loss, peripheral vision loss and general lowered acuity without field losses. Goes on to describe the difficulties experienced by three of the types (excludes total blindness) in performing everyday tasks. Focuses mainly on the problems people experience with reading and accessing their local library.

Dervin, B. (1973). Information needs of urban residents: a conceptual context. In: E. S. Warner, A. D. Murray and V. E. Palmour, Information needs of urban residents, Baltimore: Regional Planning Council.
Identifies four elements which comprise the information-seeking environment of individuals, these are: the individual information seeker; his or her information needs; available information providers; possible resolution to individual's information needs.
Of these four elements, six linkages comprise the information-seeking network of the individual and with each link, barriers may arise denying effective information access to the individual. These could include societal, institutional, physical, psychological, intellectual.

Dillon, A. (1995). What is the shape of information? Human factors in the development and use of digital libraries. In: How we do user-centered design and evaluation of digital libraries: a methodological forum, Conference of the 37th Allerton Institute.
Paper aims to identify aspects of the presentation of information within an electronic environment which will provide users with a sense of location and order. The findings from this research are intended to be fed into the design of digital library applications.

Dillon, A. and C. Watson (1996). “User analysis in HCI: the historical lessons from individual differences research.” International Journal of Human-Computer Studies, 45, pp619-637.
Paper examines the relationship between work in cognitive and differential psychology and analyses of users currently undertaken in HCI.
Looks at the history of research into individual differences over the past 100 years and compares this to research undertaken into HCI - both it seems have experienced problems of theoretical status and applicability.

Dixon, J. M. (1996). “Levelling the road ahead: guidelines for the creation of WWW pages accessible to blind and visually handicapped users.” Levelling the road ahead: guidelines for the creation of WWW pages accessible to blind and visually handicapped users,14:1(53), pp65-68.
Considers the changing role of the librarian in light of the provision of information about electronic resources. Written in 1996, this paper covers

the main points regarding accessible web design. May be useful to compare with current developments.

Drury, C. G. and a. others (1987). Task analysis. In: G. Salvendy, Handbook of human factors. Chichester: John Wiley and Sons.

Ebina, T. and others (1999). “GUI Object search method using a tactile display.” Electronics and communications in Japan, 82(8), pp40-49.
The development of the graphical user interface (GUI) has made interfaces generally more accessible to 'sighted' people, but less accessible to visually impaired people. There is a need to develop a system by which visually impaired people can operate GUIs comfortably. An evaluation experiment with visually impaired users was performed using a tactile display. The experiments and results are discussed in this paper.

Edwards, A., D.N (1996). “The rise of the graphical user interface.” Library Hi-Tech, 14(1), pp46-50.
Discusses the origins of the graphical user interface and how for some people it has been a positive development whereas for others it has been a threat. Visually impaired people, for example, have experienced barriers to accessing the GUI. Paper goes on to reveal developments which have begun to address these barriers and describes efforts to adopt GUIs for non-sighted people, including projects such as GUIB (Textual and Graphical User Interfaces for Blind People).

Eskola, E. L. (1998). “University students' information seeking behaviour in a changing learning environment: how are students' information needs, seeking and use affected by new teaching methods?” Information Research, 4(2).
Study of how students' behaviour can be affected by certain teaching methods. Includes some background into information behaviours and information seeking behaviour.

Faulkner, C. (1998). The essence of human-computer interaction. London: Prentice Hall.
Includes a chapter on the user's physical capabilities look at the way information is gathered through the five senses: vision, hearing, taste, smell and touch.

Gill, J. (1993). Access to graphical user interfaces by blind people. In: A vision of technological research for visually disabled people. Peterborough: RNIB.
Begins with a definition of visual impairment, including different types and the sight problems they may cause. Useful sections on getting about and daily living with examples of some of the problems blind people may experience such as mistaking oven cleaner for hairspray! Brief history of

information access, starting with the work of Louis Braille and Dr William Moon and moving onto technological developments of more recent years. The increasing use and development of GUIs is discussed together with the work of the EC funded GUIB (Textual and Graphical User Interfaces for Blind People) project.

Goble, C., S. Harper, et al. (2000). Travails of visually impaired web travellers, In: Proceedings of the Eleventh ACM Conference on Hypertext and Hypermedia, ACM Press.
Proposes a universal interface to aid visually impaired users. Looks at the differences between sighted and visually impaired people as they perform certain tasks - compares real life travel and mobility with virtual travel around the web. Presents a framework for identifying travel objects as either cues to aid travel or obstacles to hinder travel, the aim being to maximise cues and minimise obstacles. This framework could then be used to improve the design of interfaces for visually impaired users - and other users.

Green, T. R. G. (1986). “Cognitive aspects of HCI.” Computer Bulletin, September, pp7-9.

Grimaldi, C. and T. Goette (1999). “The Internet and the independence of individuals with disabilities.” Internet Research: Electronic Applications and Policy, 9(4), pp272-280.
Considers the impact of the use of the Internet on people with disabilities. The sample chosen are described as having 'physical disabilities'. Concludes that usage of the World Wide Web and Telnet benefits independence for this group of people.

Hackos, J. T. and J. C. Redish (1998). User and task analysis for interface design. New York: John Wiley.
Chapter on users. Considers user characteristics and how these might relate to system design. Identifies different categories of user: primary, secondary and user communities.

Holscher, C. and G. Strube (2000). Web search behaviour of Internet experts and newbies. In: The web: the next generation: Proceedings of the 9th International World Wide Web Conference, Amsterdam.
An investigation of the types of knowledge relevant for web-based information seeking and which knowledge structures and strategies are involved. Paper describes two experiments, the first to develop a model of information seeking, the second to test the model by comparing two relevant types of knowledge. Experiments examine the effects of web experience and subject knowledge. Paper provides details of how the experiments were undertaken using 'mental walk throughs', 'verbally explicit' inputs to the computer and 'thinking aloud'.

James, F. (1998). Lessons from developing audio HTML interfaces. In: ASSETS 98 3rd Annual ACM conference, California.
Research into the idea that audio renderings can be produced in the same way that visual renderings are from the HTML mark-up of pages. Paper discusses sounds to use in an audio HTML interface and describes the AHA framework (the Audio HTML Access framework).

Jansen, B. J. (2000). “The effect of query complexity on Web searching results.” Information Research, 6(1), http://www.shef.ac.uk/~if/publications/infres/paper87.html.
Reports on a study of information retrieval using Web search engines. Draws on previous research into this area which highlights the fact that users seldom use Boolean operators and generally choose a simple query form over an advanced one. The research, conducted by Jansen, evaluated results from simple searches and advanced searches and concluded that there was often very little difference in results. This is seen as an important implication for web search services, as performing more complex queries "may not be worth the increased effort required to learn the advanced searching rules or the increased risk of making a mistake".

Karshmer, A. I. (1995). Navigating the graphical user interface (GUI) by the visually impaired computer user. In: Y. Anzai et al eds. Proceedings of the symbiosis of human and artifact, Elsevier Science, pp149-154.
Paper begins with a description of the GUI and the problems it poses to blind and visually impaired users. Points out that simply adding tools to existing interfaces to render them more accessible for blind and visually impaired people does not address the issue of 'user interfaces for all'. Goes on to describe experimental systems which use tonal clues to enable blind and visually impaired users to navigate through complex interface structures which are organised in the same way to those used by sighted people.

Kautzman, A. M. (1998). “Virtuous virtual access: making web pages accessible to people with disabilities.” Searcher. 6(6), p42.
Considers the possible legal requirements of providing accessible web pages (from a US perspective). Highlights some of the main accessibility issues and the major developments in accessible web design including a list of Internet resources 'that help make web sites accessible'.

Khan, K. and C. Locatis (1998). “Searching through cyberspace: the effects of link cues and correspondence on information retrieval from hypertext on the world wide web.” JASIS, 49(14), pp1248-1253.
Paper on the effects of links cues and link correspondence on search performance using a hypertext document with external links to other resources on the WWW. A number of tests conducted failed to prove the

effectiveness of providing external links to focus browsing and information retrieval but demonstrated the 'powerful effects' of using the same or similar wording in links to search tasks.

Kinnell, M., L. Yu, et al. (2000). Public library services for visually impaired people: LISU Occasional Paper no.26. Loughborough: LISU.
Reports on a survey undertaken of public library services for visually impaired people in 2000. Includes results of previous surveys undertaken in 1997 and 1999. Current survey covers areas such as policy statements, budgetary provision and levels of service. Describes relevant work such as that of Share the Vision, the RNIB/NLB partnership and the funding from the DCMS. A set of recommendations are given for each area and are directed toward relevant bodies such as the DCMS, Public Library Authorities and specific national agencies.

Kleinschmidt, J. J. (1999). “Older adults' perspectives on their successful adjustment to vision loss.” Journal of visual impairment and blindness February, pp69-81.
Describes the successful adjustment to vision loss of a sample of 'older adults'. Includes a few examples of everyday tasks which have to be adapted due to sight loss. Mainly describes the adjustment of attitudes rather then the actual tasks.

Kline, R. L. and E. P. Glinert (1995). Improving GUI accessibility for people with low vision. In: I. Katz et al, Proceedings of the CHI'95 conference on human factors in computing systems, pp114-121.
Describes the UnWindows V1 toolkit designed to assist low vision users of X Windows. This system magnifies areas of the screen and also keeps track of the location of the mouse pointer. Paper describes the software from the user and implementor's points of view.

Kroksmark, U. and A. L. Thoren-Jonsson (1985). A study of relationships between experienced problems, functional ability and environmental factors. Nacka, Sweden: Forbundet Sveriges Arbetsterapeuter.
Describes the Activities for Daily Living (ADL) questionnaire which assesses the level of difficulty experienced by a visually impaired person in performing everyday tasks.

Lescher, J. (2000). “Designing web sites for the blind.” Econtent, 23(2), p14.
Focuses on making web sites accessible for blind and visually impaired people. Describes how blind and visually impaired people can access the web, design guidelines and finally how accessibility helps everyone - and is 'good business'.

Lindo, G. and L. Nordholm (1999). “Adaptation strategies, well-being, and activities of daily living among people with low vision.” Journal of visual impairment and blindness, July, pp434-446.
Strategies for adapting to sight loss are described. Positive and negative adaptation strategies used by a group of visually impaired people who attended a rehabilitation program are compared with two other groups - one group of people with neurological problems and a group of non-disabled people.

Lowgren, J. (1993). Human-computer interaction: what every system developer should know. Sweden: Studentlitteratur.

Marchionini, G. (1995). User centered methods for library interface design. In: How we do user-centered design and evaluation of digital libraries: a methodological forum, Conference of the 37th Allerton Institute.
Short paper on end user information seeking using the workgroup approach - which involves users at multiple stages of the design process. The workshop approach includes a preparatory stage in which the design team familiarises themselves with HCI theory and practice. The second stage comprises a 'cascading set of user communities' all of who have a different role to play in the design process. User communities could include library staff, frequent users, occasional users and potential users.

Marchionini, G. and A. Komlodi (1998). “Design of interfaces for information seeking.” Annual Review of Information Science and Technology, 33, pp89-130.
Comprehensive paper on information seeking and interface design. Describes the parallel development of information seeking and interface design research and how technological developments have driven them and literature trends over the past 30 years. Includes a section on users and the efforts to provide universal access through interfaces designed for users with special needs. Describes several approaches to interface design for blind and visually impaired users.

Mikovec, Z. and P. Slavik (1999). Perception of pictures without graphical interface. In: 5th ERCIM Workshop on User Interfaces for All, Dagstuhl, Germany.
Considers the problems of working in a graphical environment where limitations are present. Limitations can be on the user side such as a disability, or on the side of the system such as a small screen or telephone access. Explains how problem can be overcome by using textual information to describe a picture or graphical environment, and how descriptions should allow for information filtering to take complex graphical information into account. Uses the example of navigating around a flat using created picture descriptions and browsing in descriptions.

Morley, S. and others (1998). Auditory navigation in hyperspace: design and evaluation of a non-visual hypermedia system for blind users. In: Proceedings of Assets '98, ACM.
Describes the EU funded ACCESS project which involved the design and evaluation of a hypermedia system for blind users: DAHNI - Demonstrator of the ACCESS Hypermedia Non-Visual Interface). The DAHNI system uses a non-visual interface, non-speech sounds, three input devices: keyboard, joystick and touchtables, and a hypermedia module. Evaluation of the system is described together with results, which could be applicable to the design of other non-visual hypermedia systems such as auditory web browsers and digital talking books.

Mynatt, E. D. and G. Weber (1994). Nonvisual presentation of graphical user interfaces: contrasting two approaches. In: Proceedings of the CHI'94 conference on human factors in computing systems.
Describes the work of two contrasting projects: Mercator and GUIB, which adopted different approaches to the issue of designing non-visual interfaces for the graphical user interface. The paper discusses the main design issues for accessible interfaces and how both projects addressed these issues.

Nielsen, J. (1993). Usability engineering. Cambridge, MA: Academic Press.
Describes a "three dimensional analysis of users". The dimensions include domain knowledge, general IT experience and more specific application experience.

Nilan, M. S. (1995). Ease of user navigation through digital information spaces.
How we do user-centered design and evaluation of digital libraries: a methodological forum, Conference of the 37th Allerton Institute.
Short paper discussing the usability issue of what the author calls 'navigability' to address user-based design and evaluation issues of digital libraries. Describes methods of navigation in the traditional library setting, such as classification and indexing, and how this has changed in the digital library.

Norman, D. A. (1983). Some observations on mental models. In: D. Gentner and A. L. Stevens, Mental models. New Jersey: Lawrence Erlbaum, Hillsdale, pp7-14.
Describes some of the problems which can be associated with mental models. For example, models may be considered incomplete, unstable or unscientific.

Nothdurft, H. C. (1999). “Focal attention in visual search.” Vision research 39, pp2305-2310.
Suggests parallel and serial searching are both similar in terms of attention load but differ in the way focal attention is directed to the target.

Describes three series of experiments to test this theory in which subjects were asked to perform search tasks (searching for objects rather than for items or words) that produced serial or parallel search characteristics.

O'Briant, E. (1999). “Better designs for all people.” IIE Solutions, 31, 11, 23.
Paper describing some of the work of the Trace Center. Begins with a potted history of the Trace Center but then moves on to look at the developmental work on low vision. Includes studies into the interaction between humans and the GUI and into providing more personalised interfaces eg. touch-screen kiosks. Moves on to describe some of the products the Trace Center has produced and future development work.

Oppenheim, C. and K. Selby (1999). “Access to information on the world wide web for blind and visually impaired people.” Aslib Proceedings, 51(10), pp335-345.
Begins with a brief definition of visual impairment. Then goes on to identify some web accessibility issues such as design, standards and legislation. Reports on the testing of three search engines by a small group of visually impaired students to assess their reactions in terms of accessibility.

Persson, L. O. (1990). Adaptation to chronic disease and handicap: a critical analysis and summary. Goteborg, Sweden: Department of Psychology, Univ. of Goteborg.
Persson's adaptation questionnaire describes positive strategies: acceptance, trust, positive avoidance, minimisation, independence and control, and negative strategies: denial, resentment, shame, isolation and helplessness.

Petrie, H. and S. Morley (1995). Tactile-based direct manipulation in GUIs for blind users. In: Proceedings of the CHI'95 Conference on Human Factors in Computing systems.
Short paper on the GUIB project which uses auditory and tactile information rather than visual information to make interfaces for blind users more accessible. In particular the GUIB interfaces incorporates a touchpad and braille display to give the blind user a similar feeling of interaction which sighted users gain from using a mouse.

Petrie, H. and S. Morley (1997). Initial design and evaluation of an interface to hypermedia systems for blind users. In: Proceedings of the 8th ACM Conference on hypertext.
Paper on the initial design and evaluation stage of the DAHNI (Demonstrator of the ACCESS Hypermedia Non-visual Interface) system, developed for the EU funded ACCESS project.

Petrie, H. and S. Morley (1998). The use of non-speech sounds in a hypermedia interface for blind users. In: Proceedings of the 5th international conference on auditory display.
Description of a system developed for the TIDE ACCESS project which uses non-speech sounds to navigate through the computer interface. Includes a review of the literature into the use of non-speech sounds in interfaces and then goes on to describe the ACCESS Hypermedia system.

Poulter, A., G. Tseng, et al. (1999). Designing web sites. In: The library and information professional's guide to the world wide web. London: Library Association, pp25-28.
Short paper covering basic design principles concentrating mainly on the structure of files and links.

Raman, T. (1996). Emacspeak: a speech interface. In: Proceedings of the CHI'96 conference on human factors in computing systems.
Describes the development of Emacspeak, an application which provides both visual and speech feedback - the later of which is designed to be sufficient by itself. Paper describes the concept of screen reading and its shortcomings and then goes on to describe how Emacspeak works for various computing tasks including surfing and browsing the Web.

Ravden, S. and G. Johnson (1989). Evaluating usability of human-computer interfaces: a practical method. Chichester: Ellis Horwood Ltd.
Chapter three on evaluation provides a comprehensive checklist which is divided into a number of sections: criterion based questions each based on a different goal which a well-designed user interface should meet. Usability problems section focuses on specific problems users may have experienced whilst carrying out the tasks.

RNIB (1998). The Internet and how to access it. Peterborough: RNIB.

Ross, D. (1998). “Wearable computers as a virtual environment interface for people with visual impairment.” Virtual Reality, 3(2), pp212-221.
Paper regarding development work on virtual environment interfaces to includes features related to navigational tasks and/or the interactive needs of the user. Concentrates on a study of the evaluation and comparison of a number of user interface structures (suggested by subjects in an earlier study). Focuses mainly on the problems blind and visually impaired people are faced with when crossing the street, however other activities such as interacting with information kiosks, automated bank teller machines and self-service terminals should also be applicable to the system in development.

Rowley, J. (1996). The basics of information systems. London: Library Association.

Describes the way users receive, perceive and process information as the 'perceptual model' of users.

Rowley, J. and F. Slack (1998). Designing public access systems. Aldershot: Gower.
Provides useful points to consider when designing an interface. Different theories are discussed, such as cognitive frameworks or mental models, perceptual models and learning styles. Examples are given of several forms of interface evaluation, such as observation, interpretative evaluation, predictive evaluation. The data collection methods and analysis described include interaction logging, expert reviews and usage simulations.

Savidis, A. and C. Stephanidis (1995). Developing dual user interfaces for integrating blind and sighted users: the HOMER UIMS. In: Proceedings of the CHI'95 conference on human factors in computing systems, Denver CO.
Paper describes the development of a user interface management system called HOMER (UIMS: User Interface Management System). A fairly technical paper which seeks to address the need for integrated user interfaces which can be used by both sighted and blind users.

Shneiderman, B., D. Byrd, et al. (1997). “Clarifying search: a user-interface for text searches.” D-Lib Magazine, January, http://www.dlib.org/
Considers the problems of current interfaces - in particular search interfaces such as Infoseek and AltaVista - which are often found to be confusing and inconsistent. Describes a four-phase framework for user-interface design aimed to provide users with clearer, easier to learn interface with better control, while still retaining the features of individual collections. Case studies of two user-interface redesigns are used to clarify the framework and guidelines provided.

Sjoberg, L., E. Svensson, et al. (1979). “The measurement of mood.” Scandinavian Journal of Psychology, 20, pp1-18.
Describes the 'mood adjective checklist' which uses 71 adjectives describing various moods such as elated, nervous, indifferent which the respondents rate on a 4-point scale.

Spink, A., T. D. Wilson, et al. (1998). “Modelling users' successive searches in digital environments. A National Science Foundation and British Library funded study.” D-Lib Magazine, April, http://www.dlib.org/dlib/april98/04spink.html.
Paper explores the 'successive search phenomenon' which is a method of information retrieval involving repeated searches in relation to a specific problem which may evolve over a period of time. Recognises the fact that people conduct information-seeking activities over long periods from a

variety of sources in order to address a specific problem or question. Aims to derive criteria for use in the design of information retrieval interfaces and systems to support this type of search behaviour. Describes the work of two related research projects plus other related research.

Spink, A. and J. L. Xu (2000). “Selected results from a large study of Web searching: the Excite study.” Information Research, 6(1), http://www.shef.ac.uk/~is/publications/infres/paper90.html.
Results of a series of tests looking at the searching behaviour of Excite users. Findings include analysis of query formulation, re-formulation, phrase searching, relevance feedback and viewing of results.

Stephanidis, C. and P. L. Emiliani (1998). Design for all in the TIDE ACCESS project,
http://www.dinf.org/tide98/164/stephanidis_emiliani.html
Description of the TIDE ACCESS project, focussing on the design of user interfaces for all. The project offers a 'novel approach to solving accessibility and usability problems of disabled and elderly people' which is briefly described.

Thatcher, J. (1994). “Problems and challenges of the graphical user interface.” The braille monitor, January, pp43-48.
Defines the difference between text and graphical interfaces and discusses the advantages of the GUI - even for blind and visually impaired people. Describes how screen readers could be developed in the GUI environment and identifies two problems which may arise - that of error or status messages and what the author calls 'active point issue' ie. location of the cursor.

Todd, H. and F. Wolf (1994). You and your sight: living with a sight problem. London: HMSO (for the RNIB).
Published by the RNIB, covers a wide range of situations which blind and visually impaired people (and their friends, family etc) may experience, including coping with day by day activities such as cooking and housework.

Williamson, K. (1995). Older adults: information, communication and telecommunications: PhD Thesis. Melbourne: Department of Social Sciences. Melbourne, RMIT.

Williamson, K. (1998). “Discovered by chance: the role of incidental information acquisition in an ecological model of information use.” Library and Information Science, 20(1), pp23-40.

Williamson, K., D. Schauder, et al. (2000). “Information seeking by blind and sight impaired citizens: an ecological study.” Information research, 5(4).

The information seeking behaviours of blind and visually impaired people is considered in this study. Begins with a review of literature on disability and information seeking, concluding that there is very little about the information seeking behaviour of blind and visually impaired people. The study used a combination of focus groups and individual interviews to look at information seeking in general and then focussed on use of the internet. Concentrates more on what types of info are sought rather than what navigation strategies are used.

Wilson, T. D. (2000). "Human information behaviour." Informing Science, 3(2).
A history and overview of the field of human information behaviour. Includes definitions of information behaviour, information-seeking behaviour, information searching behaviour and information use behaviour. Concludes with new models of information behaviour

Wilson, T. D., D. Ellis, et al. (1999). Uncertainty in information seeking: final report to the British Library Research and Innovation Centre/Library and Information Commission on a research project carried out at the Department of Information Studies, University of Sheffield.
Final report of a project to investigate aspects of information seeking and searching in the context of a theoretical model of problem solving. Existing models of Kuhlthau and Ellis were used.

Wolfram, D. (2000). A query-level examination of end-user searching behaviour on the Excite search engine. In: CAIS 2000: Proceedings of the 28th Annual Conference of the Canadian Association for Information Science. http://www.slis.ualberta.ca/cais2000/wolfram.htm.
Analysis of user-based studies of information seeking behaviour using the Excite search engine. Findings revealed that users generally submit unique queries and do not tend to modify searches or browse further than the first two pages of results.

Zajicek, M. and C. Powell (1997). Building a conceptual model of the world wide web for visually impaired users. In: Proceedings of the Ergonomics Society 1997 Annual Conference, Grantham.
Describes experiments conducted using the WebChat application which was developed as part of a project called the SPEECH Project (BrookesTalk - a web browser for the blind and visually impaired) undertaken at Oxford Brookes university. The project aims to find the best way of presenting the contents of a web pages for anyone using speech-only technology.

Zweizig, D. L. (1973). Predicting amounts of library use: an empirical study of the role of the public library in the life of the adult public: PhD Dissertation. New York: Syracuse University.

A study of adults and the role of public libraries. Identifies demographic and non-demographic variables which can affect information-seeking patterns. Non-demographic examples could include the amount of book reading undertaken, the amount of community involvement, past use of professional sources, how open minded people were, knowledge of the library and the perceived credibility of the library as an information provider.

For further details about the bibliography or the NoVA project, please contact:

Jenny Craven, Research Fellow
CERLIM
The Manchester Metropolitan University
Department of Information and Communications
Geoffrey Manton Building
Rosamond Street West
Off Oxford Road
Manchester M15 6LL

Tel: 0161 247 6142
Fax: 0161 247 6979
Email: j.craven@mmu.ac.uk

Last updated January 2001