

The HUSAT Research Institute and Human-Computer Interaction

In August 1970 Brian Shackel launched the Human Sciences and Advanced Technology (HUSAT) Research Group (later Institute) at Loughborough University. Over the next three decades it played a prominent role in the development of human-computer interaction.

HUSAT began with 10 research staff, most of them ergonomists or psychologists but also computer scientists and industrial designers. Brian had come from running the Ergonomics Lab in EMI Electronics and he was convinced that the emergent computer revolution needed an injection of human factors to ensure it could be used by a wide section of the public. The mission of the group was to help, in the jargon of the day, to make the technology 'user friendly'.

In the 1970s the applications of interactive computing technology were mainly in the world of work and HUSAT undertook many evaluations of these applications highlighting problems of usability and inappropriate systems specification. This led to the beginnings of interventions to help design teams specify user needs and design usable forms of interaction. The majority of the funding came from industrial sources although there was some research council funding for studies of the human implications of computer applications.

In the early years there were two significant scientific culture issues that the group had to contend with and which have remained significant issues. First, human-computer interaction is inherently a multidisciplinary subject and that meant it had no natural home within the disciplinary structure of academia. Second, the approach of the Group was to work closely with technology providers and users and, where possible, to provide practical inputs to new developments. However, under the pressures of the Research Selectivity Exercises (now the Research Excellence Framework - REF), universities were increasingly requiring members of staff to undertake the kind of research that could be reported in high impact journals and applied research and consultancy became lower priority.

In the 1980s, however, working with industry on human-computer interaction received two very significant boosts. First the establishment of the UK Alvey Programme created opportunities for human factors teams to work in consortia with the UK IT industry and other academics. Secondly, the launch by the EU of the ESPRIT programme (and later other programmes such as RACE) meant that similar opportunities were created to work with IT suppliers and universities across Europe. These programmes provided HUSAT staff with opportunities to study design processes and to progress the ambition to create user-centred design processes in which user issues were addressed at all stages of design. As a result, substantial work was undertaken on user requirements specification, usability design, usability evaluation and processes of user adoption. Where the technical system was to be used within a particular application domain or organisational context, work was also undertaken on sociotechnical systems design to establish the systems context in which human-computer interaction would take place. Practical systems design toolsets were produced that would allow this knowledge to be transferred effectively to industry through general and tailored courses for industry and public sector organisations. We had the opportunity to integrate human factors elements into the Department for Social Security's Operational Strategy for IT.

In the 1990s, the theme of user-centred design continued but in a widening context. The technology was now spawning many consumer products and the internet was beginning its path to dominance. As a result the research staff were working on a wide range of different applications all with different implications for human-computer interaction: for example: electronic journals, mobile phones, website design, automation of the factory, computer-supported cooperative work and distance learning. The Research Institute never lost

sight of its mission to help all design processes become more user-centred and important contributions were made to the development of user interface and usability guidelines and standards. The focus on consumer products also led to a broadening of usability to cover all aspects of user experience. And to mitigate the dangers of a digital divide, extensive work was undertaken on accessibility to ensure the benefits of the technology were widely available. The requirement to work in a rapidly expanding range of contexts meant that the Institute expanded in size, at one time employing over 50 research staff.

The European Commission recognised the need to support the development of ICT including a strong human factors component which led to HUSAT securing significant application research funding through programmes such as ESPRIT, IST and RACE. Drawing upon on Brian's work on operational usability, a framework for usability testing was developed, enabling it to become a central part of the system design process. HUSAT was part of the *Usability Now!* initiative, funded by the Department for Trade and Industry to promote the importance of usability in IT systems, achieved by improving human-computer interaction.

Funding was also obtained to develop design guidelines for emerging technologies such as telephone products, videoconferencing, and multimedia. HUSAT was successful in disseminating human factors knowledge through EC funded support actions and, in one project, a network of European Usability Support Centres was set up to assist EU application projects as well as other organisations. Significant early work was conducted both in the UK and Europe to explore early stage in-car technologies such as route navigation and traffic information systems, voice control of in-car functions and communications, and head up displays. New tools were employed by HUSAT staff for prototyping such as Apple's HyperCard which enabled realistic interactive simulations to be produced for clients so that design concepts could be envisioned.

Many of the basic human factors concepts that HUSAT researchers worked with such as understanding the user, task and environment, keeping designs simple, designing the social and technical systems in tandem, and the importance of keeping humans in the loop during automation, have stood the test of time.

Resources: We have attached an obituary for Brian Shackel reported in the special edition of *Interacting with Computers* in 2009 that was devoted to his contribution. We hold copies of the major publications, reports and toolsets from the Institute going back to the beginning in 1970. Summaries of European Commission funded projects are available on the CORDIS website (cordis.europa.eu).

Emeritus Professor Ken Eason,
Dr. Martin Maguire
Dr. Val Mitchell,

The School of Design and Creative Arts,
Loughborough University

Annex: Obituary for Brian Shackel

CV : B Shackel, MA (Cantab), HonDTech, FBPsS, HonFErgSoc, FHF&ES, C Psychol

Name : Brian Shackel

Age : Born 9 January 1927

Qualifications : 1944 Open Exhibition Clare College, Cambridge
1947 BA Classics, Cambridge
1951 MA
1952 Part II Natural Sciences Tripos (Psychology), Cambridge
1993 Doctor of Technology honoris causa, Loughborough

Ergonomics Society (Honorary Fellow) (Former Treasurer, Chairman & President)
British Psychological Society (Fellow)
Human Factors Society (USA) (Fellow)
Biological Engineering Society (Former Treasurer)

Experience & Appointments

1947-1950 Royal Navy. Instructor Lieutenant; EVT Centre, The Nore (1947-8), HMS Ganges (1948-50)
1950-1951 Northbridge House Prep School, Second Master
1951-1952 Cambridge, Part II Natural Sciences (Psychology)
1952-1954 MRC Applied Psychology Research Unit, Cambridge.
Research Worker on Human Motor Performance and Tracking Tasks
1954-1969 EMI Electronics Limited, Research Psychologist and Head of Ergonomics Laboratory
1969-1992 Professor of Ergonomics, Department of Human Sciences (formerly Ergonomics and Cybernetics), University of Technology, Loughborough
1970-1992 Director HUSAT Research Institute (earlier Group & Centre) (Human Sciences and Advanced Technology)
1972-1982 Head of Department, Department of Human Sciences
1978-1981 Dean, School of Human and Environmental Studies
1993 Professor Emeritus

Editorships

1963-1969 Editor of Ergonomics Research Society Circular Newsletter, precursor of The Ergonomist
1969-1975 Scientific Editor of *Applied Ergonomics*
1974-1979 Editor of *Journal of Occupational Psychology*
1981- Member of the Editorial Board and Editor for papers assigned (by Editor) of the International Journal of Man-Machine Studies, now *International Journal for Human-Computer Studies*

Awards

1974	Human Factors Society (USA) - Distinguished Foreign Colleague Award
1984	Ergonomics Society - Society Lecturer
1987	Ergonomics Society - Bartlett Medal to HUSAT Research Centre
1992	Silver Core Award of the International Federation for Information Processing
1993	Ergonomics Society - Bartlett Medal to B Shackel (see citation attached)
1999	IFIP Council approved proposal by TC.13 for the 'Brian Shackel Award' (unknown by BS until approved by TC.13) (see specification attached)
2004	Elected a Member of the CHI Academy (Distinguished Fellows of the US Association for Computing Machinery Special Interest Group on Computer-Human Interaction)

Learned Society Memberships & Appointments

1953- 1969-	Member, British Psychological Society Fellow
1971-1978	Council Member
1971-1978	Chairman, British Psychological Society Publications Committee
1956- 1963-1969	Member, Ergonomics Research Society Treasurer, Ergonomics Research Society
1975-1978	Chairman, The Ergonomics Society
1985- 1989-1991	Fellow President, The Ergonomics Society
1991-	Honorary Fellow
1961- 1970-	Member, Human Factors Society (USA) now the Human Factors & Ergonomics Society Fellow
1956- 1956-1962	Founder Member, Biological Engineering Society Treasurer
1958-1965	Founder Member & Treasurer, International Federation for Medical Electronics, later International Federation for Medical & Biological Engineering
1978-1991 1983-1991	Council Member, International Ergonomics Association Treasurer, International Ergonomics Association
1985-	Member, British Computer Society Human-Computer Interaction Group
1986- 1986-	Member, Association for Computing Machinery (ACM) (USA) Member, ACM Special Interest Group on Computer-Human Interaction (SIGCHI)
1988-1992	Member of the British Computer Society Human-System Interaction Technical Committee
1989-1995	Founder Chairman of IFIP TC.13 - Technical Committee 13 on Human-Computer Interaction of the International Federation for Information Processing
1995-2001	Secretary of IFIP TC.13 - Technical Committee 13 on Human-Computer Interaction of the International Federation for Information Processing

Publications

Books

* = *Items related to Human-Computer Interaction*

Shackel B (ed) 1974 Applied Ergonomics Handbook, pp.122. Guildford, IPC Science and Technology Press.
ISBN 0-902852-38-8

* Shackel B (ed) 1979 Man-Computer Communication. Infotech State of the Art Report Vol 1, pp.348.
Maidenhead, Infotech International. ISBN 8553-9570-2

* Shackel B (ed) 1981 Man-Computer Interaction. Dordrecht, Netherlands, Martinus Nijhoff, pp.560.
ISBN 90-286-0910-5

* Shackel B (ed) 1985 Human-Computer Interaction - INTERACT 84, pp.983. Amsterdam, North-Holland.
ISBN 0-444-87773-8

* Bullinger H-J & Shackel B (eds) 1987 Human-Computer Interaction - INTERACT '87, pp.1138. Amsterdam,
North-Holland. ISBN 0-444-70304-7.

* Diaper D, Gilmore D, Cockton G & Shackel B 1990 Human-Computer Interaction - INTERACT '90, pp.
1078. Amsterdam, North-Holland. ISBN 0-444-88817-9.

* Shackel B & Richardson S (eds) 1991 Human Factors for Informatics Usability, pp 438. Cambridge,
Cambridge University Press. ISBN 0-521-36570-8.

Published Papers

(very many in refereed journals but some book chapters and published conference papers)

* = *Items related to Human-Computer Interaction*

Shackel B 1957 Diminishing the zero drift in recording DC from the human body surface.
Quarterly Journal of Experimental Psychology, 9, 109-110

Shackel B & Beaney M 1957 A zero correcting servo for use with DC amplifiers.
Electronic Engineering, 29, 284-286

Shackel B 1957 Human engineering and electronics. British Communications & Electronics 4, 350-356

* Shackel B 1958 Ergonomics for a computer. Design, 120, 36-39

Shackel B 1958 The effect of certain drugs upon the galvanic skin response.
British Journal of Dermatology, 70, 155-165

Shackel B 1958 A rubber suction cup surface electrode with high electrical stability.
Journal of Applied Physiology, 13, 153-158

Shackel B, Sloan R C & Warr H J 1958 Detector plots eye movements (an eye movement measuring
apparatus). Electronics, 31, No 5, 36-39

Shackel B 1959 Skin Drilling: a method of diminishing galvanic skin potentials. Amer. J. Psychol, 72, 114-121

Shackel B 1959 Review of the past and present in oculography. In C N Smyth (ed) Medical Electronics, Proc
II International Conf Medical Electronics, 57-62, London, Iliffe

- * Shackel B 1959 A note on panel layout for numbers of identical items. *Ergonomics*, 2, 247-253
(a first example of a method that is now called 'paper prototyping')
- Shackel B 1959 Machine Design for Safety. In National Industrial Safety Conference Proceedings, pp 48-65.
London, Royal Society for Prevention of Accidents (RoSPA)
- Shackel B 1960 Control rooms. *Design*, 133, 28-35
- Shackel B 1960 Pilot study in electro-oculography. *British J. Ophthalmology*, 44, 89-113
- Shackel B 1960 Note on mobile eye view-point recording. *J Optical Society of America*, 50. 763-768
- Shackel B & Davis J R 1960 A second survey with electro-oculography. *Brit J Ophthalmology*, 44, 337-346
- Shackel B & Davis J R 1960 Changes in the EOG potential level. *British J Ophthalmology*, 44, 606-618
- Shackel B 1961 Electro-oculography: the electrical recording of eye position. *Proc III International Conf on Medical Electronics*, 323-335, London, Institution of Electrical Engineers
- Shackel B 1961 Ergonomics in the design of medical electronic apparatus. *Proc III International Conf on Medical Electronics*, 385-389, London, Institution of Electrical Engineers
- Shackel B, Anderson D M, Weedon P & Davis D 1961 A semi-automatic chart analyser. *Proc III International Conf on Medical Electronics*, 49-51, London, Institution of Electrical Engineers
- Shackel B 1961 Ergonomics in equipment design. *Instrument Practice*, 15, 705-712
- Shackel B, Davis J R & Abercrombie M L J 1962 Electro-oculography in a pilot study of cerebral palsied children. *I R E Trans Bio-Medical Electronics*, BME-9, 112-115
- * Shackel B 1962 Ergonomics in the design of a large digital computer console. *Ergonomics*, 5, 229-241
- Shackel B & Davis J R 1962 Choosing control knobs. *Engng Mat & Design*, 5, No 8, 568-569 and 605-607
- Shackel B, Davis J R & Abercrombie M L J 1962 Pilot study of version movements of eyes in cerebral palsied and other children. *Vision Research*, 3, 135-153
- Shackel B 1963 Medical applications of television - a survey. *Medical Electronics & Biological Engineering*, 1, 35-50
- Shackel B 1963 An introduction to ergonomics. United Nations Conference on Science & Technology for Less Developed Areas, Geneva, 4-20 February, Paper B 64 (pp18)
- Shackel B 1965 QUIS? A retrieval system for library documents and Tufts and DSIR Human Sciences Bibliographies. *Human Factors*, 7.5, 431-447
- Shackel B 1965 Improvements relating to Scales especially for Oscilloscopes. *British Patent No 1026671*
- * Shackel B 1966 Research needs in the field of systems design and skill requirements under automation. Paper to SRC/SSRC Symposium on Occupational Psychology
- Shackel B 1966 Ergonomics and Design. In S H Gregory (ed) *The Design Method*, pp 49-57. London, Butterworths
- Shackel B 1967 Eye Movement Recording by Electro-Oculography. In P H Venables & I Martin (eds) *A Manual of Psychophysiological Methods*, pp.299-334. Amsterdam, North Holland

- * Shackel B, Beevis D & Anderson D M 1967 Ergonomics in the automation of meat handling in the London Docks. *Ergonomics*, 10.2, 251-265
- Shackel B & E L C White 1967 Improvements relating to navigational aids. British Patent No 1090725
- * Shackel B 1967 Ergonomics research needs in automation. *Ergonomics*, 10.5, 627-632
- * Shackel B 1968 The Man-computer link: a survey of existing equipment. EMI Electronics Report DMP 3145
- Shackel B & Watson G R 1968 Closed-Circuit Television. In C Engel (ed) *Photography for the Scientist*, pp.553-606. London, Academic Press
- Shackel B, Chidsey K D & Shipley P 1969 The assessment of chair comfort. *Ergonomics*, 12.2, 269-306
- * Thorne P & Shackel B 1969 Man as an adaptive recognition component in an automation plant. In ERS - IEEE Symposium on Man-Machine Systems, Vol.4 pp.1-16. IEEE Conference Record No. 69C58-MMS.
- * Shackel B 1969 Man-Computer Interaction: the contribution of the human sciences *Ergonomics*, 12, 485-499 and *IEEE Trans on Man-Machine Systems*, MMS-10(4), 149-163
- Shackel B 1969 General framework and workstation analysis. (Chapter 2 for the *Applied Ergonomics Handbook*) *Applied Ergonomics*, 1, 33-41
- Shackel B 1969 Workstation analysis - turning cartons by hand. *Applied Ergonomics*, 1, 45-51
- * Shackel B 1970 Man-Computer Interaction - a Review of Ergonomics Literature and Related Research, pp.113. EMI Electronics Report No DMP 3472. Hayes, Middlesex, EMI Electronics Ltd.
- * Shackel B 1971 Human Factors in the P L A Meat Handling Automation Scheme: A Case Study and Some Conclusions. *International J of Production Research*, 9, 95-121
- * Shackel B 1971 Criteria in Relation to Large-scale Systems and Design. In: WT Singleton, JG Fox & D Whitfield (eds) *Measurement of Man at Work*, pp 223-231. London, Taylor & Francis. ISBN 0-85066-041-6.
- * Shackel B 1973 Man-Computer Interaction, the contribution of the human sciences. Infotech State of the Art Report No 10 Interactive Computing, pp 483-502. Maidenhead, Infotech International Ltd
- Shackel B (ed) 1974 I.E.A. International Symposium on Ergonomics and Standards - Proceedings of the Symposium 1-4 April 1973, organised by WF Floyd & B Shackel, at Loughborough University, on behalf of the International Ergonomics Association and with the support of the British Standards Association, pp.386. Loughborough, Loughborough University
- Shackel B & van Nes F L 1975 Ergonomics in Brazil. *Applied Ergonomics*, 6.1, 43-44
- Shackel B & Klein L 1976 Esso London Airport Refuelling Control Centre Design - an ergonomics case study. *Applied Ergonomics*, 7.1, 37-45
- * Shackel B 1976 Process Control - Simple and Sophisticated Display Devices as Decision Aids. In T B Sheridan & G Johannsen (eds), *Monitoring Behaviour and Supervisory Control*, pp.429-443. New York, Plenum. ISBN 0-306-32881-X
- Haggard M P & Shackel B 1978 Monitoring financial support for psychological research. *Bulletin of the British Psychological Society*, 31, 3-8

- Shackel B 1980 Ergonomics in Comparative Car Testing for 'Motoring Which'. In DJ Osborne and JA Levis (eds) *Human Factors in Transport Research*, pp.411-419. London, Academic Press
- Shackel B 1980 'Motoring Which?' - 18 Years of Human Factors in Comparative Car Testing - An Historical Review. SAE Technical Paper No. 800332, pp1-13. Warrendale PA, Society of Automotive Engineers
- Shackel B 1980 Factors Influencing the Application of Ergonomics in Practice. *Ergonomics*, 23.8, 817-820
- * Shackel B 1980 Dialogues and Language - can computer ergonomics help? *Ergonomics*, 23.9, 857-880
- * Shackel B 1980 The Challenge of the Non-Expert User. In Infotech State of the Art Report on the Non-Expert User, Vol. 1, 1-29. Maidenhead, Infotech International
- * Shackel B 1981 Man-Computer Interaction (MCI) - Reality and Problems. In: B Shackel (ed) *Man-Computer Interaction*, pp 3-27. Dordrecht, Netherlands, Martinus Nijhoff. ISBN 90-286-0910-5.
- * Shackel B 1981 The Concept of Usability. In *Proceedings of IBM Software and Information Usability Symposium*, Poughkeepsie, NY 15-18 September, pp. 1-30.
- * Shackel B & Spiliotopoulos V 1981 Towards a Computer Interview Acceptable to the Naive User. *International J of Man-Machine Studies*, 14, 77-90.
- * Shackel B 1982 The BLEND System - Programme for the study of some 'electronic journals'. *Ergonomics*, 25.4, 269-284, *JASIS*, 34.1, 22-30, and *The Computer Journal*, 25.2, 161-168.
- * Shackel B 1982 Plans and Initial Progress with BLEND - an electronic network communication experiment. *International J of Man-Machine Studies*, 17, 225-233.
- * Maude TI, Dodd WP, Pullinger, DJ & Shackel, B 1982 The BLEND Electronic Journal System. *Inter University Committee on Computers Colloquium, I.U.C.C. Bulletin*, 5.1, 22-26.
- * Pullinger DJ & Shackel B 1982 BLEND & LINC - Network Communication to Explore Electronic Journals. *Proceedings of the IEE Conference on Man-Machine Systems*, pp. 262-266. London, IEE
- * Pullinger DJ, Shackel B, Dodd WP & Maude, TI 1982 The BLEND 'Electronic Journal' Experimental Programme - Some Questions Answered. *ALPSP Bulletin*, June, 11-20
- * Shackel B 1982 Are Serials on the Way Out? In: Urquart, J.A. (ed) *Proceedings of UK Serials Group Conference 'The Information Chain'*, *Serials Monograph No. 5*, pp. 34-39. London, UK Serials Group
- * Shackel B et al 1983 The BLEND-LINC Project on 'Electronic Journals' After Two Years. *ASLIB Proceedings*, 35.2, 77-91, and *The Computer Journal*, 26.3, 247-252
- * Shackel B 1984 The Concept of Usability. In Bennett J et al (eds) *Visual Display Terminals : Usability Issues and Health Concerns*, pp 45-88. Englewood Cliffs NJ, Prentice-Hall. ISBN 0-13-942482-2
- * Shackel B 1984 Information technology - a challenge to ergonomics and design. *Behaviour and Information Technology*, 3.4, 263-275
- * Shackel B & Pullinger DJ & the BLEND Team 1984-1991 BLEND Reports 1 to 9 Background & Development, Software Infrastructure, The 'Electronic Journal' Research, User-System Interaction, *The Computer Human Factors Journal*, *The References, Abstracts & Annotations Journal*, Other Studies and User communities, Cost Appraisal, Overview and Appraisal. London, British Library Board.
- * Pullinger DJ & Shackel B 1984 Progress of the BLEND-LINC 'Electronic Journal' Project. In Van der Laan, A. & Winters, A.A. (Eds.), *The Use of Information in a Changing World*; pp. 227-261. Amsterdam,

North-Holland.

- * Shackel B 1985 Designing for People in the Age of Information. In Shackel B (ed) Human-Computer Interaction - INTERACT'84, pp 9-18. Amsterdam, North-Holland. ISBN 0-444-87773-8
- * Shackel B 1985 Usage Issues in Electronic Mail, Conferencing and Journal Systems. In Shackel B (ed) Human-Computer Interaction - INTERACT'84, pp 921-922. Amsterdam, North-Holland.
- * Dodd W P, Maude T I, Pullinger D J & Shackel B 1985 Software Infrastructure for the BLEND-LINC Electronic Journal Experiment. In Shackel B (ed) Human-Computer Interaction - INTERACT'84, pp 933-936. Amsterdam, North-Holland. ISBN 0-444-87773-8.
- * Pullinger D J, Shackel B, Dodd W P & Maude T I 1985 User surveys in the BLEND-LINC Electronic Journal Project. In Shackel B (ed) Human-Computer Interaction - INTERACT'84, pp 945-950. Amsterdam, North-Holland. ISBN 0-444-87773-8.
- * Shackel B, Pullinger DJ, Maude TI & Dodd WP 1985 BLEND: The Need for Effective Human-Computer Interaction in the Design of Electronic Journal Systems. ALPSP Bulletin, Oct., 10-20.
- * Shackel B 1985 Human Factors & Usability - Whence & Whither? In: H-J. Bullinger (ed) Proc. ACM German Chapter Conf. Software-Ergonomie '85 (Stuttgart) pp 13-31. Stuttgart, Teubner. ISBN 3-519-02443-8
- * Shackel B 1985 Ergonomics in Information Technology in Europe - a Review. Behaviour & Information Technology, 4.4, 263-287
- * Shackel B 1985 Using RAAJ for Real. J. Librarianship, 17, 200-204
- * Shackel B 1986 IBM Makes Usability as Important as Functionality. The Computer Journal, 29.5, 475-476
- * Shackel B 1986 Ergonomics in Design for Usability. In: MD Harrison & AF Monk (eds) People & Computers: Designing for Usability, pp 44-64. Cambridge University Press. ISBN 0-521-33259-1
- * Shackel B 1986 Ergonomics and the Impact of I.T. on Work and Leisure. In D Morrison, L Hartley & D Kemp (eds) Trends in the Ergonomics of Work, pp 1-27. Carlton, Victoria, Ergonomics Society of Australia & New Zealand. ISSN 0-726-7029.
- * Shackel B 1986 Research into electronic journals: a broad overview. In D Morrison, L Hartley & D Kemp (eds) Trends in the Ergonomics of Work, pp 102-117. Carlton, Victoria, Ergonomics Society of Australia & New Zealand. ISSN 0-726-7029.
- * Shackel B 1987 Ergonomics - the Vital Link to Information Technology. In Proceedings of Joint Societies Conference on Information Technology and People, at the Royal Society (14 January), pp 10-21. Leicester, British Psychological Society.
- * Shackel B 1987 Human Factors for Usability Engineering. In C.E.C. Directorate General of T.I.I.I. (eds) ESPRIT'87 Part No.2 pp 1019-1040. Amsterdam, Elsevier ISBN 0-444-70332-2
- * Shackel B 1987 An overview of research on electronic journals. In: G Salvendy (ed) Cognitive Engineering in the Design of Human-Computer Interaction, pp 193-206. Amsterdam, Elsevier. ISBN 0-444-42848-8
- * Shackel B 1987 Human Factors of Input and Output Devices. In: DF Rogers & RA Earnshaw (eds) Techniques for Computer Graphics, pp 403-419. New York, Springer-Verlag. ISBN 0-387-96492-4.
- * Shackel B 1988 The management of usability. In: H-J Bullinger et al (eds) EUROINFO'88 - Information Technology for Organisational Systems, pp.51-56. Amsterdam, North-Holland ISBN 0-444-70427-2.

- * Shackel B 1988 Introduction to the Design of End-User Interfaces. In Infotech State-of-the-Art Report on Designing End-User Interfaces, pp 97-109. Maidenhead, Infotech International ISBN 0-08-034120-9
 - * Shackel B & Dowling R 1988 Simulation and prototyping for ergonomists. In AS Adams et al (eds) Ergonomics International'88 - Proceedings 10th IEA International Congress, pp 687-689. Melbourne, Ergonomics Society of Australia.
 - * Dowling R & Shackel B 1988 Learning to use DB Demo as a simple prototyping tool. In: E D Megaw (ed) Contemporary Ergonomics, pp 63-68. London, Taylor & Francis. ISSN 0267-4718.
 - * Hotson PM & Shackel B 1990 Screen size and word processing: a study on the Z88 lap-top computer. In: Lovesey E J (ed) Contemporary Ergonomics 1990, pp. 347-352. London, Taylor & Francis. ISBN 0-85066-851-4.
 - * Shackel B 1990 HCI 2000: From Speculation to Symbiosis. Keynote Address on videotape (followed by 30 minute discussion session via telephone) to Ergonomics Society of Australia CHISIG Annual Conference (sponsored by Telecom Australia Research Laboratories) 29-30 November 1990.
 - * Shackel B 1990 Information Exchange within the Research Community. In: Feeney M & Merry K (eds) Information Technology and the Research Process, pp. 147-162. London, Bowker-Saur. ISBN 0-86291-476-0.
 - * Shackel B & Richardson S 1991 Human Factors for Informatics Usability - Background and Overview. In: Shackel B & Richardson S (eds), Human Factors for Informatics Usability; pp 1-19. Cambridge University Press. ISBN 0-521-36570-8.
 - * Shackel B 1991 Usability - Context, Framework, Definition, Design & Evaluation. In: Shackel B & Richardson S (eds), Human Factors for Informatics Usability; pp 21-37. Cambridge University Press. ISBN 0-521-36570-8.
 - * Shackel B et al 1991 Advanced Manufacturing Technology. ACOST Report. HMSO 1991. ISBN 0-11-430052-6.
- Shackel B 1991 Ergonomics from Past to Future: An Overview. In: M Kumashiro & E D Megaw (eds), Towards Human Work: Solutions to Problems in Occupational Health and Safety, pp. 3-17. London, Taylor & Francis. ISBN 0-7484-0039-7.
- * Shackel B 1991 Whence and Where - A Short History of Human-Computer Interaction. Keynote Address to HCI International'91 (International Conference on Human Aspects of Computing and Information Management). In: H-J Bullinger (ed) Human Aspects in Computing, pp. 3-18. Amsterdam, Elsevier. ISBN 0-444-88775 X.
 - * Shackel B 1991 BLEND-9: Overview and Appraisal. British Library Research Paper No. 82 British Library Research and Development Department, pp.116. ISBN 0-7123-3231-6.
 - * Shackel B 1992 HUSAT - 21 Years of HCI. In: P Bauersfeld, J Bennett and G Lynch (Eds) Human Factors in Computing Systems CHI'92, pp 281-282. Reading MA, Addison-Wesley. ISBN 0-201-53344-X
 - * Shackel B 1992 The Electronic Journal: Issues for Designers. UKOLUG State-of-the-Art Conference Database 2000. Summary in Proceedings pp 41-43. Oxford, Learned Information Ltd. ISBN 0-904933-82-2
- Shackel B 1992 Book Review of D A Norman 1988 The Psychology of Everyday Things; New York, Basic Books. Acta Psychologica, 79, 275-278

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- * Shackel B 1993 The 'Business Case' for Ergonomics in Information Technology. Paper to SEARCC'93 (South East Asia Regional Computer Conference), Hong Kong, October 1993.
- * Sweeney M, Maguire M & Shackel B 1993 Evaluating user-computer interaction: a framework. International J Man-Machine Studies, 38, 689-711.
- Parsons KC, Shackel B & Metz B 1995 Ergonomics and International Standards - History, Organisational Structure and Method of Development. Applied Ergonomics, 26.4, 249-258
- Shackel B 1996 Ergonomics: Scope, Contribution and Future Possibilities. The Psychologist, 9.7, 304-308
- * Shackel B 1997 Human-Computer Interaction - Whence and Whither? Journal of the American Society for Information Science, 48.11, 970-986.
- Shackel B 1999 How I broke the Mackworth Clock Test (and what I learned). In: MA Hanson, EJ Lovesey & SA Robertson (eds) Contemporary Ergonomics 1999, pp.193-197. London, Taylor & Francis. ISBN 0-7484-0872-X
- * Shackel B 1999 INTERACT - Then and Now. *Interfaces* Spring 1999, No. 40, 10-11; published by the British HCI Group, ISSN 1351-119X.
- * Shackel B 2000 People and Computers - Some Recent Highlights. Applied Ergonomics, 31.6, 595-608.
- Damodaran L & Shackel B 2001 Editorial: Human Factors Symposium. International Journal of Human-Computer Studies, 55.4, 371-376. (This is a Special Issue containing 18 papers, 372 pp., fully revised and refereed from the HUSAT International Symposium on Human Factors, 7-8 September 2000 and fully edited by BS, and quite a number of the papers are not specific to human-computer interaction).
- Shackel B 2004 A Users' Experience. British Journal of Educational Technology - to be published.

External Appointments

- 1959-1969 Consultant, Council of Industrial Design *Design Magazine*
- 1964-1969 Part-time Lecturer, Department of Occupational Psychology. Birkbeck College, University of London
- 1966-1969 Part-time Lecturer, School of Industrial Design (Engineering), Royal College of Art, London
- 1962-1982 Consultant, the Consumers Association, for Motoring Which?
- 1969-1978 Academic Adviser to Department of Employment
- 1975- Member of the Convocation of Aston University, on behalf of the British Psychological Society
- 1977-1994 Member of the Council of the Institute for Consumer Ergonomics, Loughborough University
- 1983-1984 Chairman of the Organising Committee and of the International Programme Committee for the IFIP INTERACT'84 Conference on Human-Computer Interaction held in London

- 1989-1990 Conference President and Chairman of the International Programme Committee for the IFIP INTERACT'90 Conference on Human-Computer Interaction held in Cambridge, organised by the British Computer Society under the auspices of IFIP
- 1987, 1993 Member of the Organising Committee and of the International Programme Committee
1995-1999 for the IFIP INTERACT'87, '93 (held with ACM SIGCHI and named INTERCHI'93), '95, '97 & '99 Conferences on Human-Computer Interaction, Stuttgart, Amsterdam, Lillehammer (Norway), Sydney (Australia) and Edinburgh.
- 1975- Member of the Editorial Board of *Applied Ergonomics*
- 1982- Member of the Editorial Board of *Behaviour & Information Technology*
- 1984-1987 Member, Information Engineering Committee of the UK Science & Engineering Research Council
- 1984-1988 Chairman of UK Alvey Programme Human Interface Advisory Committee
- 1988-1993 Member of Cabinet Office Advisory Council On Science & Technology (ACOST) Committee on Emerging Technologies
- 1988-1991 Member of ACOST Panel on Advanced Manufacturing Technology (ACOST Report published)
- 1991-1993 Member of ACOST Panel on Human Factors & Organisational Design (ACOST Report published)
- 1992- Trustee and Member of Board of Directors of the Bayswater Institute, London

In addition he has been an external examiner for courses or for doctoral theses at the Universities of Aston, Bradford, Hull, Liverpool, Nottingham, University College London and Imperial College, London.

He has also from time to time been a consultant to Hewlett-Packard, IBM, ICL, and the ISPRA Research Centre of the European Commission.

The Ergonomics Society Bartlett Medal Presented to Professor Brian Shackel in 1993

The Ergonomics Society was founded in 1949, the first in the world in this discipline which has now grown to have an International Ergonomics Association with over 20 national member societies. The highest award of The Ergonomics Society is the Bartlett Medal, named after Sir Frederic Bartlett FRS (the first Professor of Experimental Psychology in Cambridge 1926-1952).

The Bartlett Medal was recently awarded to Professor Brian Shackel (HUSAT Research Institute and Department of Human Sciences) at The Ergonomics Society Annual Conference. At the same ceremony the President's Award was presented to the Human Factors Laboratory at Thorn-EMI which had been founded by Brian Shackel in 1954.

The citation for the award of the Bartlett Medal reads as follows

"For his furtherance of the application of Ergonomics through new initiatives and especially in the area of the Ergonomics of Human-Computer Interaction.

Brian Shackel has been a member of the Ergonomics Society since 1954, and from then until the present day he has been one of the most active and enthusiastic proponents of the subject and over that time he has been

involved in a wide range of applications. He established and was for many years the Head of the Ergonomics Laboratory (now Human Factors Laboratory) at Thorn-EMI and was noted especially for his studies on eye movements.

In 1969 he was appointed Professor of Ergonomics at Loughborough University where he initiated the formation of The Human Sciences and Advanced Technology (HUSAT) Research Institute of which he was Founder Director. Together with his assistant directors and staff he has developed this Institute into a premier centre known in the UK and widely throughout the world for its researches and application of Ergonomics to Information Systems and Computer Technology.

Professor Shackel has been heavily involved in the dissemination of information about his subject through not only his own publications and lectures but by being editor of two scientific journals of international repute and on the editorial boards of three others. Also, on the national and international scene he has represented the interests of ergonomics and human-computer interaction. For example, he is a Member of working groups of the Cabinet Office Advisory Council on Science and Technology, and is Chairman of Technical Committee No. 13 on Human-Computer Interaction of the International Federation for Information Processing.

Brian Shackel has served in the roles of President, Chairman of Council and Treasurer of the Ergonomics Society and as Hon. Treasurer of the International Ergonomics Association. He was made an Honorary Fellow of the Ergonomics Society in 1991.

In summary then, he has devoted his working life to Ergonomics, its application and development and the dissemination of knowledge about it to national and international audiences. Ergonomics has one of its greatest advocates in Brian Shackel and the Society is pleased to present this award".

IFIP TC.13 – Brian Shackel Award

PURPOSE

The BRIAN SHACKEL AWARD is associated with each INTERACT Conference, usually biennial, and is to recognise the most outstanding contribution in the form of a refereed paper submitted to and delivered at the Conference. The purpose is to draw attention to the need for a comprehensive human-centred approach in the design and use of information technology in which the human and social implications have been taken into account. The BRIAN SHACKEL AWARD consists of a commemorative plaque and a certificate.

PROCEDURE

The BRIAN SHACKEL AWARD will be made by IFIP TC.13. The general criterion is that of an outstanding contribution with international impact in the field of human interaction with, and human use of, computers and information technology. Any paper submitted to the next INTERACT Conference can be a candidate, except any written by members of the Award Committee. This Committee (three persons + a chairperson) will be chosen by and out of the members of TC.13.

The Chairperson(s) of the INTERACT Conference Papers Committee will be asked to invite all referees to draw attention to any paper which they consider to be of such outstanding quality that it merits consideration for the BRIAN SHACKEL AWARD. After they have reviewed all submissions and decided those to be accepted into the Conference Programme, the Chairperson(s) will consider the papers recommended by the referees and any others which they themselves consider meritorious. They will then forward a short list, of at least 3 and not more than 7, with copies of the papers to the Chairperson of the Award Committee.

The Award Committee will scrutinise, prioritise, shortlist and recommend with reasons a single paper to TC.13, to be written up in a brief report (only if the highest equal quality compels it will more than one Award be made). This nomination must be approved by TC.13 for the Award to be made. All submissions, discussions and votes relating to the Award are to be kept strictly confidential.

Before making public the decision the TC.13 Chairperson will inform the Author(s) of the chosen paper. The BRIAN SHACKEL AWARD will be presented to the winner(s) at an appropriate Ceremony of INTERACT, normally the Opening Ceremony. During this presentation the Chairperson of TC.13 will make a short speech based on the report of the Award Committee.

PUBLICITY

Information about the BRIAN SHACKEL AWARD will be given in the IFIP Newsletter, on the TC.13 and IFIP websites, and in the INTERACT Call for Papers. The members of TC.13 are responsible for obtaining free publicity for the award in the specialist journals of their own countries. Within one month after INTERACT, if possible, the Award Paper will be mounted on the TC.13 and the IFIP websites.

PROFESSOR BRIAN SHACKEL

This award marks the contribution of Professor Brian Shackel to the establishment of Human-Computer Interaction as an international discipline. Professor Shackel, Emeritus Professor at Loughborough University and Founding Director of the HUSAT Research Institute, organised the first INTERACT Conference in London in 1984 and played a leading role in establishing the conference as a regular feature of the international calendar. In 1989 the IFIP Technical Committee No. 13 on 'Human-Computer Interaction' was established from his initiative to encourage international co-operation and foster the development of work on HCI around the world. He was the Chairman of TC.13 from 1989 to 1995. As a result of his tireless commitment many researchers around the globe now have opportunities to study human-computer interaction. Through this award the encouragement he offered to researchers in the field will be continued.

Invited Lectures and Visits

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| 1959 | 'Machine Design for Safety' principal address to the National Industrial Safety Conference of the Royal Society for the Prevention of Accidents (Scarborough, UK, 8-10 May) |
| 1967 | 'Ergonomics in Electronic Equipment and Systems Design' invited lecture, Institution of Electrical Engineers (IEE London, March) |
| 1968 | 'Man and Automation' invited talk to the UK Parliamentary and Scientific Committee (Houses of Parliament, June) |
| 1972 | 'Safety and Human Engineering' invited lecture to a special meeting of managers and engineers, Japan National Railway, Tokyo, and other lectures to Japan Ergonomics Research Society |
| 1974 | 'Ergonomics in Europe & at Loughborough University' and 'Redesigning the Control Room at ESSO London Airport' invited lectures to the First Brazilian Symposium on Ergonomics (Rio de Janeiro, 9-13 September) |
| 1976 | Visiting scientist in Algiers planning total degree programme in Ergonomics for the Ministry for Higher Education of the Algerian Government (3 weeks) |
| 1979 & 1981 | Visiting scientist, assistance with staff selection, planning Ergonomics course components and presenting a short course in Ergonomics, at University do Minho, Braga, Portugal (10 & 7 days) |
| 1981 | 'The Concept of Usability' opening address to the IBM Software and Information Usability Symposium (Poughkeepsie, USA, 15-18 September) |
| 1981 & 1983 | Visits during sabbatical to M.I.T. Cambridge (2 months), V.P.I. & S.U. Blacksburg Virginia (1 month) and Stanford University (3 months) |
| 1984 | 'Ergonomics in the Information Age' the Society Lecture to the annual conference of the Ergonomics Society (Exeter, 2-5 April) |

- 1984 'Designing for People in the Age of Information' keynote address to the IFIP international conference Human-Computer Interaction INTERACT'84 (London, 4-7 September)
- 1986 'Ergonomics and the Impact of IT on Work and Leisure' opening keynote address to the Annual Conference of the Ergonomics Society of Australia & New Zealand (Perth, 24-28 November), following lectures on IT Usability and the BLEND Project at ESANZ branches in Sydney, Brisbane, Melbourne and Adelaide.
- 1987 'Human Factors for Usability Engineering' plenary address to ESPRIT'87, 4th Annual ESPRIT Conference (Brussels, 28-29 September)
- 1990 'HCI 2000 - from Speculation to Symbiosis ?' opening address by videotape, with questions/ answers via telephone and public address at the conference, to the second annual conference of the Computer-Human Interaction Special Interest Group of the Ergonomics Society of Australia (Telecom Research Laboratories, Clayton, Victoria, 29-30 November)
- 1991 'Ergonomics from Past to Future: an Overview' keynote address to First Pan-Pacific Conference on Occupational Ergonomics - Ergonomics at Work (Kitakyushu, Japan, 10-13 July)
- 1992 Visiting scientist and lectures to the USAF Armstrong Laboratory Human Engineering Division, for USAF Office of Scientific Research (Dayton, Ohio, 20-24 April)
- 1993 Visiting scientist and lectures at University of Technology Sydney (Sydney, Australia, 5 November to 6 December)
- 1993 'Electronic Documentation - past imperfect and future conditional?' opening keynote address to OZCHI'93 Conference of the Computer Human Interaction Special Interest Group of the Ergonomics Society of Australia (University of Canberra, 23-26 November)
- 1998 Visiting scientist and lectures (*The 'Business Case' for Human Factors in Information Technology and Ergonomics for Industry - an Overview*) at King Fahd University of Petroleum & Minerals (Dharan, Saudi Arabia, 27 April to 1 May)
- 1998 'Human Factors in Computing - the Early Days 1954-1970' address to the Computer Conservation Society (London, the Science Museum, 28 May).

Editor's note

Interacting with Computers appreciates the services of Emeritus Prof. Ken Eason, Loughborough University of Technology, in securing this copy of Prof. Shackel's c.v.