

Index

A

- AARP survey 1
 - acceptance 128, 132, 133, 142, 143, 152
 - acceptance resistance 306, 317
 - access-to-care problems 11
 - acoustic communication systems 181
 - acoustic environments 180, 181, 188, 192, 194, 195, 196, 198, 199, 201, 207
 - acoustic human-machine interaction 181, 185, 190, 193, 196, 200
 - acoustic information transfer 181
 - acoustic interfaces 181, 182, 185, 186, 193, 195, 200, 201
 - acoustic signals 188, 207
 - acoustic user interface 194, 195, 196, 197, 199, 207
 - action research (AR) 257, 271
 - active medical treatment 34
 - activity theory 89, 91, 92
 - activity theory, development 65, 69, 70, 71, 74, 75, 76, 85, 87, 92
 - activity theory, hierarchical structure of activity 81, 92
 - activity theory, internalisation/externalization 92
 - activity theory, mediation 79, 92, 93
 - activity theory, object-orientedness 92
 - adaptability 207
 - adaptable user-interfaces 180, 200
 - adapted medical task model 28
 - affective computing 226, 231, 233
 - affective systems model 216, 217
 - affordance 92
 - Africa 2, 11
 - after-scenario questionnaires (ASQ) 5
 - age-related diseases 127, 139
 - age-related restrictions 127
 - aging concept 125
 - aging in place 1, 2, 16
 - aging, normal 128
 - aging, pathological 128
 - aging population 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 42, 44, 48, 54, 66, 67, 68, 69, 70, 82, 83, 84, 85, 86
 - aging process 127, 128, 133, 137
 - ambient assisted living (AAL) 96, 254, 319
 - ambient media 92
 - American Association of Retired Persons (AARP) 1, 3, 16
 - American Hospital Association 273
 - analysis of performance 135, 136, 139
 - artificial intelligence 55, 62, 227, 228, 229
 - artificial neural networks 222
 - aspects of ergonomics 127
 - Attention Deficit Hyperactive Disorder (ADHD) 47
 - audiograms 183, 207
 - audiograms, pure-tone 207
 - augmented reality (AR) 45, 55, 60, 63, 64
 - automatic speech recognition (ASR) 186
- ## B
- baby boomers 2
 - Banaji, Mahzarin R. 211
 - behavioral science paradigm 67
 - biocybernetic loop 215
 - biomedical sciences 96
 - blended reality space 65, 76, 77, 78, 79, 80, 82, 88

- blood pressure (BP) 12
 Bluetooth enabled technology 55
 Brainstorm 324, 326, 331
- C**
- C++ 56
 care assistants 271
 care, ethics of 166, 177
 cell phone for seniors 128
 chair of medical engineering (mediTEC) 234
 clinical information process unit (CIPU) model 29
 clinical-information-process-unit-model 29, 36
 cocktail-party effect 182, 207
 cognitive engineering 247, 248, 251
 cognitive modelling 239, 242, 247, 251
 cognitive perceptual motor-goals operators
 methods selection (CPM-GOMS) rules
 244, 245, 249
 cognitive processing 215, 243, 244
 cognitive task analysis approach 244
 cognitive walkthrough (CW) 42, 322
 command line interface (CLI) 69
 command module 221, 223
 computer aided surgery (CAS) 237
 computer-based performance 98
 computer-created environment 223
 computerized provider order entry systems 307
 computer-on-wheels (COW) 308
 computer physician order entry (CPOE) 297,
 315
 computer-related self-efficacy 99
 concept of usability 25
 concept stage 136, 137
 conceptual blending 76, 88, 93
 context-aware computing 75, 93
 controller modules 221, 223
 cross-sectional design 301, 317
 Crowder, Robert G. 211, 226
 Csikszentmihalyi, Mihaly 224, 227, 232
 customers 72, 90
- D**
- data analysis 323, 326, 329, 334, 335, 338
 decibels (dB) 183, 184, 190, 194, 195, 198
 decision-making process 141, 166
 deference effect 304, 317
 demographic aging 2
 demographic development 127
 Department of Trade and Industry (DTI) 44
 dereverberation 186, 188, 189, 193, 203, 204,
 207
 Descartes, René 65, 93
 design stage 136, 146, 147, 306, 307
 dichotomy 65, 66, 69, 75, 79, 80, 81, 93, 211
 diffusion of innovations 306, 314, 317
 digital information 79, 80, 84, 93, 311
 DIN EN 60601-1-6 237
 DIN EN ISO 14971 240
 disease analysis 132
 disease analysis, boundary problem 132
 disease analysis, rehabilitation problem 132
 diseases 129
 DITIS project 254
 domestic environment 127, 131, 147
 “drawing-board” approach 221
 dynamic markets 235
 dynamic range 184, 207
- E**
- e-BP service 12, 13
 e-BP technologies 13, 14
 e-business practices 154
 e-care 155
 ecological approach 211
 e-commerce 154, 270
 EEG Biofeedback Equipment 55
 e-health 1, 2, 3, 4, 5, 10, 11, 12, 16, 18, 38, 40,
 41, 42, 43, 44, 46, 47, 48, 49, 50, 51, 52,
 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 65,
 154, 155, 156, 157, 158, 162, 163, 164,
 165, 168, 169, 172, 175, 176, 177
 e-health applications 41, 42, 47, 57, 58, 95
 e-health choices 157
 e-health system 42, 43, 46, 47, 48, 49, 50, 51,
 52, 53, 54, 55, 56, 57, 58, 59, 65
 e-health technologies 3, 5, 67, 154, 156, 162,
 163, 164, 165, 168, 169
 e-health tools 276
 e-Home Healthcare @ North Calotte (eHHC)
 255, 256, 257
 elaboration stage 136, 137, 146, 147

Index

elderly population 127, 135, 152, 154, 155, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 173, 176, 178
electronic health records (EHR) 40, 297, 312
electronic medical records (EMR) 286
e-mail 3
embodied interaction 88, 93
end-user 41, 43, 44, 55, 121
Engineering and Physical Science Research Council (EPSRC) 43
ergonomic approach 22, 23, 40
ergonomic design 23, 24, 25, 137, 140, 147
ergonomic development 23
ergonomic point of view 25
ergonomics 22, 23, 24, 25, 26, 27, 29, 30, 31, 36, 37, 38, 39, 40
ergonomic working systems 22, 24, 36
European Ambient Assisted Living Innovation Alliance 180, 202
evaluation methods 321, 332, 335, 337
evaluator effect 335, 338
evidence, convergence of 300, 317
evolutionary approach 35
experiential design 65, 72, 74, 82, 91, 93
experiential-practical dichotomy 65, 80, 81
experiential realism 93

F

face recognition 46, 55
failure mode and effects analysis (FMEA) 234, 237, 238, 242, 243, 245, 246, 247, 248, 250
family caregivers 3
fast Fourier transform (FFT) 220, 221
Fauconnier, Gilles 76, 88, 93
fault tree analysis (FTA) 238, 242
Flora 255, 257, 258, 259, 260, 262, 263, 265
focus groups 10, 21, 41, 42, 44, 50, 51, 52, 57, 58
follow-up therapy 33
Food and Drug Administration (FDA) 235
formative evaluation 338
formative usability evaluation 320, 321

G

General Electric (GE) 3
generic error modeling system (GEMS) 242, 250
Gibson, James Jerome 73, 88, 92
global positioning systems (GPS) 42, 46, 55
graphical user interfaces (GUI) 69, 75
grounded theory 305

H

half-structured interview 7
Harvard Medical Practice Study 236
Hawthorne effect 303, 317
head-mounted display (HMD) 44, 55
Health and Medical Services Act (HSL) (1982) 255
healthcare domain 296, 302, 306
healthcare environments 296
healthcare ethics 176, 177
healthcare professionals 1, 7, 11
healthcare services 272
healthcare systems (HCS) 1, 16, 296, 317, 321, 325, 326, 330, 332
healthcare technology 296
healthcare workforce 1
health information systems 297, 299, 307
health information technology (HIT) 296, 297, 299, 305, 306, 307, 312, 315, 317
Health Insurance Portability and Accountability Act (HIPPA) 8
health-related communication 13
health systems management 154
hearing aids 182, 199, 200, 204, 207
heuristic evaluation (HE) 322
holistic approach 180, 181, 197, 201, 299
holistic bias 305, 317
Home Assurance System (GE) 3
homecare 253, 255, 268, 269, 271
home healthcare applications 319, 320, 321, 322
hospital information system (HIS) 34
HRSA's Bureau of Health Professions 274
human-centered approach 93, 296
human-centered communities 306

- human-centered design (HCD) 65, 66, 67, 70, 71, 85, 296, 298, 299, 306, 311, 317
- human-centeredness 65
- human-centered research 296, 297, 306, 311
- human-computer interaction (HCI) 60, 62, 64, 65, 69, 70, 73, 74, 75, 78, 79, 80, 82, 88, 92, 93, 180, 181, 182, 185, 186, 187, 190, 191, 192, 193, 196, 197, 199, 200, 201, 209, 214, 306, 320, 322, 323, 325, 333
- human error 235, 236, 250, 251
- human error risk analysis 235
- human factors 43, 61, 62, 63, 64
- human-human interaction 236, 239, 240, 242
- human-induced risk potentials 238
- human-machine communication 181, 186, 193
- human-machine interaction (HMI) 24, 181, 182, 185, 186, 187, 190, 192, 193, 196, 197, 199, 200, 201, 233, 235, 236, 237, 238, 240, 242, 245, 247, 248, 251
- human-machine interface 139, 218, 234, 244, 251
- human-machine-system model 27
- human perception, hearing 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207
- human perception, vision 180
- human thinking, metaphors of 322, 335, 338
- human-user dichotomy 65
- I**
- ICT-based environments 69
- ICT context 112, 114
- ICT design 256
- ICT-tool 31
- illnesses 41, 45, 49
- Immersion 233
- immersive stimuli 221, 223
- impaired people 157
- independent living 3, 8, 15, 127, 147
- in-depth interview 7
- information and communication technology (ICT) 13, 23, 154, 253, 254, 255, 256, 257, 260, 261, 263, 265, 266, 267, 269, 270, 271
- information flow 296, 297, 298, 305, 307, 308, 309, 310, 311, 315, 317
- information systems (IS) 254, 269
- information systems (IS) design 67
- information technology (IT) 3
- INNORISK 240
- instant data analysis (IDA) 323, 324, 326, 327, 328, 329, 330, 331, 332, 333, 334, 338
- institution-to-institution transmission 96
- interaction design 82, 93, 251
- International Ergonomic Association (IEA) 23, 37, 40
- International Standards Organization (ISO) 24, 25, 26, 27, 30, 37, 40, 42, 71, 89
- interrelated subsystems 301
- Ishii, Hiroshi 70, 75, 80, 84, 88, 89, 90, 93
- ISO 6385 standard 24, 37
- ISO 9241-11 standard 24, 25, 27, 37, 40, 42, 71, 89
- ISO 9241-12 standard 25
- ISO 9241-13 standard 25
- ISO 9241-14 standard 25
- ISO 9241-17 standard 25
- ISO 9241-110 standard 24, 25, 26, 37
- ISO 13407 standard 71, 89
- Iterative Testing and Evaluation (RITE) 322, 336
- IT research 99
- IT systems 254, 260, 263
- J**
- Java 45, 56, 58
- Johnson, Mark 93
- K**
- Kjeldskov, Jesper 323, 332, 333, 335, 338
- knowledge, explicit 69, 71, 82, 86
- knowledge management system 35
- L**
- Lakoff, George 93

Index

Landauer, Thomas K. 333
late adopters 42, 44
Latin America 2
learning models 41
Leonti'ev, Aleksei Nikolaevich 92
life autonomy 105, 107
longitudinal design 301, 307, 317
long term-care facilities 156
loudness recruitment phenomenon 184, 190, 207
Loughborough University (UK) 44
Lower Saxony Research Network Design of Environments for Ageing project 158

M

mAIXuse 234, 235, 240, 241, 243, 245, 246, 247, 248
mediated presence 65, 79, 80, 82, 87, 88, 90, 91, 92, 93
mediated presence research 65
medical branch 235
medical care providers 28, 35
medical communication 9
medical device directive (MDD) 235
medical dictionary 34
medical information systems (MIS) 67
medical knowledge 27, 34, 35, 304
medical malpractice 27, 235
medical risk-sensitive systems 237
medical-task-model 28, 36
medical technology 95, 96, 97, 99, 100, 101, 103, 104, 107, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 125, 164, 235, 248, 295
medical technology (MT) 103, 110, 114, 116, 117, 125
medical work system 235
medico ergonomics approach 22, 23, 27, 31
mental health 41, 42, 43, 45, 46, 47, 48, 49, 52, 53, 57, 58, 59
mental health issues 42
meta-analysis 2, 211, 212, 229
Microsoft's Health Vault 286
Microsoft SQL Server 261
mixed method approach 12
mobile ICT 253, 254

model-based concept 193
model-based usability-evaluation software tool 239
model-based usability-evaluation tool 239
model human processor (MHP) 244
moderators 21
MT, arguments against 125
MT, arguments for 125
multimodal 43, 236, 244
multi modal platforms 320, 321
multi-user input 186

N

National Institute on Aging 2, 18
natural setting 317
Neisser, Ulric 211, 228
neurocognitive measures 211
neurocognitive assessment 209, 211, 215
neurocognitive batteries 209, 210, 222
neurocognitive data points 223
neurocognitive measures 209, 210, 211, 222
neurocognitive performance 215, 218, 223
neurocognitive profiling 209, 219, 223
neurocognitive research 211
neurocognitive tasks 218
neuroergonomic 213
neuropsychological ability 209, 222
neuropsychological assessment 209, 210, 211, 218, 230
neuropsychology 208, 209, 211, 225, 226, 230
Nielsen, Jakob 333
noise reduction 203, 205, 206, 207
non-linear system 215
North America 2
note review 324, 326
nursing homes 156, 171, 177
nursing science 154, 155, 168

O

objective phenomena 66
object-oriented (OO) approach 56, 58
obsessive compulsive disorders (OCD) 45
"off-the-shelf" approach 221
older adults 2, 11, 18, 20
older users 1, 2, 11, 16, 28
one-on-one qualitative methods 10

operating room (OR) 236, 237, 239
 outpatient care 155, 156

P

Palm Pilot 254, 256, 261, 262, 263, 264, 265, 266, 271
 paramedics 41, 42, 43, 44, 52, 55, 57, 58, 59, 62
 participatory action research (PAR) 253, 254, 255, 256, 257, 261, 266, 267, 271
 participatory design (PD) 253, 254, 255, 256, 257, 261, 266, 267, 268, 271
 patient autonomy 130
 patient data management system (PDMS) 34
 patient dignity 130
 patient privacy 130
 patient religiousness 131
 patient security 130
 patient social contacts 131
 Patient-Staff-Machine-Interaction-Model 27, 36
 patient-staff-machine model 29
 patient well-being 130
 PC-supported documentation systems 159
 peer-to-peer communication 96
 perceived ease of use (PEOU) 158, 163, 171
 perceived usefulness (PU) 158
 performance restriction 152
 personal-based approach 238
 personal computer 103, 107, 125
 personal computers (PC) 69, 76, 77
 personal digital assistants (PDA) 55, 68
 personal health records (PHR) 275, 276, 277, 286, 288, 289, 290, 292
 personalization 207
 pervasive computing 42, 60, 62
 PHR technology 275
 physical health 41, 45, 47, 49, 52
 physiological computing system 222
 Picard's model 215, 216
 picture archiving and communication system (PACS) 34
 planning stage 136, 144, 146, 280
 pre-conceptual model 304
 privacy 167, 170, 171, 172, 173, 175, 177
 privacy issues 4, 8, 9, 14, 16, 17

process officer 259
 product development 149, 152
 product individualization 152
 profiling module 221, 223
 program evaluation review technique (PERT) 244, 245
 prototypal system 247
 psychological dimension 129
 psychological health 217
 psychometric properties 211, 225
 psychomotor learning 218, 221
 psychophysiological assessment 209, 218, 220, 221, 222
 psychophysiological computing 208, 209, 214, 215
 psychophysiological data 209, 213, 215, 220, 221
 psychophysiological feedback 214, 221
 psychophysiological interface 220, 221, 222, 224, 225
 psychophysiologicaly-driven adaptive virtual environment 223
 psychophysiological measure 214, 221, 222
 psychophysiological metrics 209, 212
 psychophysiological perspective 222
 psychophysiological profile 218, 221, 223
 psychophysiological research 213
 psychophysiological responses 210, 212, 214, 217, 218, 222
 psychophysiological signals 212, 221, 223
 psychophysiology 208, 209, 210, 219, 220, 225, 226, 227, 230, 231, 232, 233
 public health services 154
 Pulsometers 55
 pure tones 194, 207

Q

qualitative data 305
 qualitative evaluation 64
 qualitative methods 21, 298, 299, 307, 317
 quality of life 128, 129, 130, 134, 135, 151
 quantitative evaluation 64
 questionnaires 4, 5, 12, 14, 21

R

radiology information system (RIS) 34

Index

real-time psychophysiological measure 221
registered nurses (RNs) 279, 282, 283
requirement descriptions 128
researcher bias 303, 304, 317
research network 155, 158, 178
research paradigm 212
respiratory therapists (RTs) 279, 282, 283
response effect 304, 318
return on investment (ROI) 72
reverberation 181, 182, 184, 186, 187, 188,
191, 193, 194, 197, 198, 199, 201, 202,
203
risk analysis 235, 237, 240, 241, 242, 245, 247,
251
risk management process 235, 237, 248
robotics 158

S

Salt Lake City 297
secure socket layer (SSL) 265
self assessment 163
self-report data 212
senior citizens 127, 128, 129, 130, 131, 132,
133, 134, 135, 136, 140, 142, 143, 144,
146, 147, 148, 149
sensor-based activity 155, 158, 159, 160, 161,
162
sensor-based activity determination scenario
159
sensor-based technologies 159, 162
sensorineural hearing impairment 184
sensor-supported data collection 160
sensor-supported monitoring 162
sensory restrictions 131, 137
serious games 55, 64
severity rating 324
signal processing algorithms 220
signal-to-noise-ratio (SNR) 186
small and medium-sized enterprises (SME)
248
smart healthcare applications 319, 321, 323,
324, 332, 333, 334
smart healthcare systems 321
smart homes 44, 63, 95, 125
smart home technology 158, 163
social aspect 50, 55

social component 129
social facilitation 50
social isolation 116, 128
social life 105, 125, 129
social loneliness 105, 106, 115, 118, 125
socially-oriented traits 6
social networking technology 83
social phobia 47
social psychology 55, 58
social security funds 162
Social Services Act (SoL) 255
social situation 137
social virtual environments 55
socio-political considerations 272
software-based tool 234, 235
SOPRANO project 254
speech communication 180, 181, 182, 183,
185, 190, 193, 195, 200
spurious correlation 305
state-of-the-art technologies 180, 181
structured interview 21
subjective phenomena 66
subjective technical confidence (STC) 107
sub tasks 29, 30
summative evaluation 338
systematic usability evaluation 237
system ergonomics 23
system-oriented approach 238

T

tangible interaction 93
tangible media 83, 93
task-process-task model 28, 29, 35, 36
task review 324, 326
technical learning history 107, 125
technical system 153
technology acceptance 1, 2, 3, 4, 16, 18, 21,
97, 99, 119, 121, 123, 157, 272, 275,
288, 293
technology acceptance model (TAM) 2, 3, 4, 6,
41, 42, 51, 54, 55, 58, 163, 288
technology adoption 3, 4, 19, 99, 288, 292,
306, 307
technology assessment model (TAM) 51
technology design 306, 310, 317
technology usability 306

telecare 155, 170, 176, 178
 telehealth 11, 12, 13, 19, 21, 157, 169, 170,
 174, 175, 176, 177
 telehomecare 178
 telemedicine 1, 11
 telenursing 155, 156, 157, 162, 172, 173, 175,
 178
 TES system 261, 264, 265, 271
 text-to-speech 55
 theoretical framework 300, 307, 318
 the planning system (TES) 265
 therapy protocols 223
 transparency of privacy 164, 168
 triangulated research methods 303
 triangulation 300, 304, 318
 Turner, Mark 76, 78, 87, 88, 93

U

ubiquitous biological monitoring 320, 321
 unified theory of acceptance and use of technol-
 ogy (UTAUT) 4, 99
 Unifies Modelling Language (UML) 56
 United Kingdom (UK) 41, 43, 44, 45, 60, 63
 United States 3, 19, 43
 universal approach 29
 University of Birmingham (UK) 43, 60
 usability 22, 23, 24, 25, 27, 29, 30, 31, 35, 36,
 37, 39, 40, 306, 314, 318, 319, 320, 321,
 322, 328, 334, 335, 336, 337, 338, 339
 usability engineering 41, 42, 53, 59, 63, 64
 usability engineers 42
 usability evaluation 235, 237, 239, 240, 242,
 247, 295, 319, 320, 321, 322, 323, 325,
 326, 329, 332, 333, 334, 335, 337, 338,
 339
 usability problems 319, 321, 322, 323, 324,
 326, 328, 329, 330, 331, 332, 333, 334,
 336, 338
 use error 251
 use-oriented risk analysis 235, 251
 user affect 218
 user-centered design 1, 2, 4, 15, 16, 247, 251
 user-centered design process 71
 user-centered design, qualitative evaluation
 methods of 4

user-centered design, quantitative evaluation
 methods of 4
 user-centered design (UCD) 70
 user-centred 42, 44, 47, 58, 59, 95, 118, 256
 user-centred approach 42, 44, 58
 user diversity 95, 97, 100, 104, 105, 110, 113,
 114, 115, 116, 118, 119, 126
 user-experience design 69
 user-focused methodology 55
 user-friendly 23, 28, 35
 user integration 28
 user participation 153
 users mental model 320

V

veridicality 211, 233
 verisimilitude 210, 233
 video-based analysis (VBA) 324, 326, 328,
 329, 330, 331, 332, 333, 334, 339
 virtual environment 209, 210, 212, 213, 214,
 215, 216, 218, 220, 221, 222, 223, 224,
 225, 229, 231
 virtual environment-based neurocognitive 221
 virtual environment (VE) 80, 208, 209, 210,
 211, 212, 213, 214, 217, 218, 221, 222,
 223, 228, 231
 virtual-physical dichotomy 65
 virtual reality 208, 209, 210, 211, 215, 218,
 223, 226, 227, 228, 229, 230, 233
 virtual reality exposure therapy (VRET) 211,
 212
 Virtual Reality for Cognitive Performance and
 Adaptive Treatment (VRCPAT 1.0) 222,
 223, 224
 Virtual Reality for Cognitive Performance and
 Adaptive Treatment (VRCPAT 2.0) 222,
 223, 224, 225
 virtual reality (VR) 210, 211, 214, 215, 223,
 227, 230
 virtual stimuli 223
 visual display terminals (VDT) 24, 89
 visual impairment 182, 201
 visual memory 223
 visual-motor processing 223
 Vocera 308, 310
 voice-controlled systems 181

Index

VR e-health 64
VR e-health applications 47
VR e-health scenarios 48
VR e-health system 48, 49, 50
vulnerability 164, 166, 177, 178
Vygotsky, Lev Semyonovich 92

W

wearable computers 43, 62
Wearable Computers 55, 59

web-based patient record 22, 23, 31, 34
Web-based patient records 40
WebMD. Consumers 275
well-being monitoring 158
windows, icons, menus, pointer (WIMP) GUI
70, 75, 76, 89
Wireless networks 55
work tasks 24, 29, 40
World Health Organization (WHO) 129