

MOBILE INTERACTION DESIGN

MATT JONES

University of Wales Swansea

and

GARY MARSDEN

University of Cape Town



John Wiley & Sons, Ltd

PART I: INTRODUCTION	1
Chapter 1: Possibilities	3
Key points	3
1.1 Introduction	4
1.2 What are mobile devices?	"
1.2.1 Communication or information device?	9
1.2.2 Appliance or Swiss army knife?	H
1.2.3 Cherished device or commodity tool?	I ³
1.3 Impoverished or extraordinary interfaces?	14
1.3.1 The Fastap keypad	I ⁵
1.3.2 Peephole displays	16
1.3.3 Accommodating human capabilities and limitations	17
1.4 Impoverishing interactions?	28
1.4.1 Reasons for poor design	28
1.4.2 Impacts of poor design	29
1.5 Outline of the rest of this book	35
Summary	36
Workshop questions	36
Designer tips	36
Chapter 2: Products for people	39
Key points	39
2.1 Introduction	40
2.2 Useful	41
2.2.1 Function before form	41
2.2.2 Evolving uses	42
2.3 Usable	43
2.3.1 Usable in itself	44
2.3.2 Usable in life	⁵ 1

2.4	User experience	54
2.4.1	Strong identity	55
2.4.2	Interaction as package	58
2.5	Technology acceptance	63
	Summary	64
	Workshop questions	66
	Designer tips	66
	Chapter 3: Innovating	67
	Key points	67
3.1	Introduction	68
3.2	Technology-centered approaches	69
3.3	Transferring from the desktop	74
3.3.1	Applications	75
3.3.2	Interface styles	78
3.4	Building on past mobile success	81
3.5	Drama	83
3.6	Frameworks for human-centered thinking	85
	Summary	89
	Workshop questions	89
	Designer tips	90
	PART II: DEVELOPING EFFECTIVE MOBILE APPLICATIONS	91
	Chapter 4: Interaction design	93
	Key points	93
4.1	Introduction	94
4.2	Designing what? Designing how?	94
4.3	Understanding users	96
4.3.1	From biology to psychology	96
4.3.2	Field studies	97
4.3.3	Direct questioning	99
4.3.4	Distilling the findings	100
4.4	Developing prototype designs	100
4.4.1	Shaping and managing the design space	100
4.4.2	Prototyping	105
4.5	Evaluation	106
4.5.1	Testing with users	107
4.5.2	Testing in the absence of users	109
4.6	Iterative development	112
4.7	Multiple viewpoints	113

4.7.1	Many techniques and tools	113
4.7.2	Many disciplines	113
4.7.3	Participation and collaboration	116
4.8	From interaction design to deployment	117
	Summary	118
	Workshop questions	118
	Designer tips	119
Chapter 5: Watching, asking, probing		121
	Key points	121
5.1	Introduction	122
5.2	Focusing the study	124
5.2.1	How focused should the study be?	124
5.2.2	Finding people to study	125
5.3	Top techniques for understanding people	129
5.3.1	Observing	130
5.3.2	Enquiring	138
5.3.3	Diary studies	141
5.3.4	Discount methods	145
5.3.5	Focus groups	149
5.3.6	Creatively engaging methods	151
5.4	Making sense of observations	155
5.4.1	Activities	155
5.4.2	Analysis perspectives	156
5.5	Personas and scenarios	160
5.5.1	Personas	160
5.5.2	Scenarios	163
	Summary	167
	Workshop questions	167
	Designer tips	168
Chapter 6: Prototypes		169
	Key points	169
6.1	Introduction	170
6.2	What is a prototype?	170
6.3	Different prototypes for different purposes	170
6.4	Low-fidelity	171

CONTENTS

6.4.1	Self-checking	171
6.4.2	Communicating with others	173
6.4.3	Interaction prototyping	174
6.4.4	Empowering users	176
6.5	Higher-fidelity	178
6.5.1	Deciding what to prototype	178
6.5.2	Hardware and software integration	178
6.6	Finishing the process	186
6.6.1	Evolutionary	186
6.6.2	Revolutionary	186
6.6.3	Process	187
6.7	Issues in prototyping	189
6.7.1	Some considerations	190
6.8	A final note on development	191
	Summary	192
	Workshop questions	192
	Designer tips	192
Chapter 7: Evaluation		195
Key points		195
7.1	Introduction	196
7.2	Classifying evaluation	196
7.3	'Quick And Dirty'	197
7.4	Conceptual model extraction	197
7.5	Direct observation	199
7.5.1	Finding out what users are thinking	199
7.5.2	How to record observations	200
7.5.3	How to not bias the experiment	203
7.5.4	Happy users	203
7.6	Interviews	204
7.7	Questionnaires	205
7.8	Non-user methods	207
7.8.1	Heuristic evaluation	207
7.8.2	No people whatsoever	209
7.9	Experimental evaluation	209
7.9.1	Hypothesis	210
7.9.2	The users	211

7.9.3	Tasks	212
7.9.4	Experiment design	212
7.9.5	Conducting experiments	213
7.9.6	Experimental results	214
7.10	Considering context — evaluating mobile systems	214
7.10.1	Physical context	214
7.10.2	Technological context	216
7.10.3	Social context	216
7.10.4	Other contexts	217
7.11	Complementary evaluation	218
7.12	Conclusion	219
	Summary	219
	Workshop questions	219
	Designer tips	220
	 PART III: DESIGN GALLERY - DIRECTIONS AND GUIDELINES	 221
	Chapter 8: Controlling Complex Functions	223
	Key points	223
8.1	Introduction	224
8.2	Menus and memory	225
8.3	Hierarchical menus	225
8.3.1	Learning structure	225
8.3.2	Improving classification	226
8.3.3	Context information	227
8.4	Icons	227
8.5	Manuals	233
8.5.1	Online manuals	233
8.5.2	Website manuals	234
8.6	No menus?	234
8.6.1	Data structures	235
8.6.2	Alternatives	235
8.6.3	Design ideas - data structures	238
8.6.4	Evaluation via experiment	238
8.7	More complex menus	242
8.8	Some concluding thoughts	244
	Summary	245
	Workshop questions	245
	Designer tips	245

Chapter 9: Information access	247
Key points	247
9.1 Introduction	248
9.2 Small-screen impacts	250
9.2.1 Lessons from the past	251
9.2.2 Impact on browsing complex content	255
9.2.3 Impact on searching	256
9.3 Designs for browsing	258
9.3.1 Guidelines	259
9.3.2 Schemes	261
9.3.3 Packaging content	271
9.4 Improving search	272
9.4.1 Assessing sets of results	272
9.4.2 Judging the value of individual results	274
9.5 Mobile information ecologies	280
9.5.1 Fitting in	280
9.5.2 Case study: the laid-back search tool	283
9.5.3 Peer-to-peer schemes	286
Summary	287
Workshop questions	287
Designer tips	288
Chapter 10: Beyond text - using images on mobile devices	289
Key points	289
10.1 Introduction	290
10.2 Ethnography	290
10.2.1 Where have all the photographs gone?	291
10.2.2 Digital ethnography	292
10.3 Finding photos	292
10.3.1 Meta-data	293
10.3.2 Meta-data management	294
10.4 Browsing photos	294
10.4.1 Timeline	295
10.4.2 Treemaps	295
10.4.3 RSVP	296
10.4.4 Speed Dependent Automatic Zooming	298
10.5 Downscaling case study	300
10.5.1 Arranging photos	300

10.5.2	Screen size	300
10.5.3	Write once, run anywhere	301
10.5.4	Meanwhile, back with the users	301
10.5.5	User testing	304
10.5.6	Platform	306
10.6	Advanced technology	306
10.7	What are photos for?	307
10.7.1	What are we sharing?	309
10.7.2	Using audio with photographs	311
10.7.3	Video	311
10.8	Looking to the future	312
	Summary	312
	Workshop questions	313
	Designer tips	313
	Chapter 11: Impacting the community; impacting the world	315
	Key points	315
11.1	Introduction	316
11.2	The digital divide	316
11.3	Mobiles work	316
11.3.1	The rise and rise of mobile technology	317
11.4	Planning a project	318
11.5	That culture thing	320
11.6	Case studies	325
11.6.1	Empowering people - Cybertracker	325
11.6.2	Education	327
11.6.3	Communitization	328
11.7	Call to arms	333
	Summary	333
	Workshop questions	333
	Designer tips	334
	<i>Resources</i>	335
	<i>References</i>	339
	<i>Credits</i>	365
	<i>Index</i>	367