The Experience of Interactive Art: A Curatorial Study

Elizabeth Muller

Submitted for the Degree of Doctor of Philosophy

Faculty of Information Technology
University of Technology, Sydney
2008
Certificate of Authorship/Originality

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Signature of Student

[Signature]
Abstract

Interactive art exists through the participation of its audience. There is an increasing awareness amongst artists, critics and curators that the audience’s experience is of central importance to the understanding, creation and exhibition of interactive art. Because of its emphasis on experience and participation, as well as its engagement with science and technology, interactive art offers challenges and opportunities for curatorial practice in museums and galleries. The research reported in this thesis investigates the audience’s experience of artworks in order to develop a critical framework for, and a curatorial approach to interactive art. It draws on insights, methods and techniques from the interdisciplinary field of Human Computer Interaction (HCI) for studying and working with people’s experience of interactive technologies.

The research approach of the project is reflective curatorial practice, based on close collaborations with artists during the creation and exhibition of their work. The research centres on two case studies: Cardiomorphologies, by George Khut, a physiologically interactive artwork that creates real time visual and sonic representations of the participant’s heart and breath; and Contagion, by Gina Czarnecki, a multi-user installation based on a complex interactive representation of the spread of disease within populations. Both of these artworks were publicly presented in Beta_space at the Powerhouse Museum, Sydney, a dedicated venue for “prototyping” interactive artworks developed as part of this doctoral project.

The first outcome of the research is an experiential approach to curating interactive art, which integrates the exhibition of prototype artworks with the creative process. The approach adapts techniques from HCI for use in artistic contexts.

The second outcome is a critical framework for the experience of interactive art, which draws on the work of pragmatist philosopher John Dewey and artist David Rokeby. An examination of the participants’ experiences of the two case study artworks demonstrates how the framework can be used by curators, artists and researchers to understand the aesthetic impact of interactive artworks.

Together these two outcomes demonstrate how direct engagement with audience experience contributes to interactive art research and curation. The thesis concludes by exploring future directions for this experience-centred approach, including the impact on documentation and archival practice and the curation of group exhibitions.
Acknowledgements

My thanks, first, to the artists who collaborated with me in this research, George Khut and Gina Czarnecki. It was a pleasure to work with such passionate and dedicated practitioners. I am grateful to my principal supervisor, Prof. Ernest Edmonds, who facilitated the project and in particular created the opportunity for me to develop Beta_space. Thanks are also due to my secondary supervisors Associate Prof. Toni Robertson and Prof. Ross Gibson, who both provided intellectual guidance and moral support at different stages of the research.

My thanks to the UTS Faculty of Information Technology for the International Scholarship that supported the bulk of my research. Thanks to the staff at the Powerhouse Museum for their partnership and investment in Beta_space. In particular I would like to thank Matthew Connell, curator of Cyberworlds, for his enthusiasm and good humour. Thanks to the Australasian CRC for Interaction Design (ACID) for their financial support of both Beta_space and the symposium Engage: Interaction, Art and Audience Experience in November 2006.

Thanks to my colleagues and friends at the Creativity and Cognition Studios, in particular Mike Leggett, Greg Turner and Brigid Costello, who gave me feedback on my ideas over many lunches and tea-breaks, and helped me with research documentation. Thanks to Zafer Bilda who assisted in data collection for Contagion and to Deborah Turnbull for her work on Beta_space and Engage. Thanks to everyone in the Interaction Design and Work Practice Laboratory, particularly Kirsten Sadler, Penny Hagen, Astrid twenebowa Larssen and Lian Loke for sharing inspirational texts.

I would like to thank friends who have made particular contributions to the production of this thesis: Paul Harvey for his advice on presenting data; David Low for copy-editing the manuscript; George Khut for his help with formatting; Chris Caines, Carli Leimbach and Greg Turner for documenting the artworks. Sincere thanks to Susan Wineglass, Keir Smith, Klara Leander, Tom Spence and Louise Curham for being there when I came home, with cups of tea and encouragement.

Above all, enormous thanks to Lucas Ihlein for his belief in this project and my ability to complete it, and for his invaluable editorial assistance in its final stages.

Finally I would like to thank my parents, Susan and Alan Muller, for teaching me to love to learn. This project, like everything I do, has been possible because of their support.
## Table of Contents

**CHAPTER 1 INTRODUCTION**

1.1. Research questions .......................................................... 16
1.2. Research approach .......................................................... 17
1.3. Research contributions ..................................................... 18
    1.3.1. An experiential approach to curating interactive art ........ 18
    1.3.2. A critical framework for the experience of interactive art 19
1.4. Thesis structure ............................................................ 20

**CHAPTER 2 RESEARCH APPROACH**

2.1. Introduction: Reflective Curatorial Practice .......................... 23
2.2. Context and precedents .................................................... 23
    2.2.1. Creative practice-led research ...................................... 23
    2.2.2. Examples of curatorial practice-led research ................. 25
    2.2.3. Knowledge in practice .............................................. 26
2.3. Communicating practice-led knowledge .................................. 28
2.4. The relationship between practice and writing in this thesis ..... 29
2.5. Characteristics of reflective practice .................................... 30
    2.5.1. Reflection-in and reflection-on-action ......................... 30
    2.5.2. The material of reflection-on-action ............................ 31
    2.5.3. The focus of reflection-on-action ............................... 31
2.6. Research process .......................................................... 34

**CHAPTER 3 INTERACTIVE ART AND AUDIENCES**

3.1. The challenge of a new medium .......................................... 38
3.2. Systems aesthetics and the dematerialisation of the object ....... 40
3.3. Materiality and experience .............................................. 46
    3.3.1. Physical materiality .............................................. 47
    3.3.2. Social materiality .............................................. 48
3.4. Working with experience ................................................ 50
3.5. Conclusion ................................................................. 52

**CHAPTER 4 CURATORIAL PRACTICE AND INTERACTIVE ART**

4.1. The museum as laboratory ................................................. 55
4.2. Contemporary curating .................................................... 56
4.3. Audience research in museums ......................................... 58
4.4. Interactive art and the museum ........................................ 60
4.5. Curatorial responses to digital art ..................................... 61
    4.5.1. Virtual curating .................................................. 62
    4.5.2. "Open", distributed and software assisted curating ...... 63
CHAPTER 5 HUMAN COMPUTER INTERACTION AND INTERACTIVE ART 68

5.1. Background: The human-centred approach to HCI ........................................... 69
5.2. Interaction design methods ................................................................................. 70
5.3. The rise of experience in HCI ........................................................................... 71
   5.3.1. Plans and Situated Actions: Lucy Suchman ................................................ 72
   5.3.2. The Phenomenological approach .................................................................. 73
   5.3.3. Participatory Design .................................................................................... 74
   5.3.4. The Pragmatist approach ............................................................................. 75
5.4. HCI and interactive art ....................................................................................... 76
   5.4.1. Conferences and symposia on HCI and interactive art ................................. 77
   5.4.2. Engage: Interaction Art and Audience Experience ...................................... 78
5.5. Examples of significant studies in HCI and interactive art ............................... 79
   5.5.1. Museum exhibit design and evaluation ......................................................... 80
   5.5.2. HCI laboratory-based evaluation .................................................................. 81
   5.5.3. Situated studies of audience interaction ....................................................... 82
5.6. The rise of aesthetics in HCI ............................................................................. 84
5.7. Pragmatist aesthetics and HCI ......................................................................... 85
5.8. Summary of conclusions from the literature review ......................................... 86
5.9. How the literature review addresses the research questions ............................ 87

CHAPTER 6 A CRITICAL FRAMEWORK FOR THE EXPERIENCE OF
INTERACTIVE ART: JOHN DEWEY AND DAVID ROKEBY 90

6.1. Introduction ....................................................................................................... 91
6.2. John Dewey ....................................................................................................... 92
6.3. Art as Experience ............................................................................................. 93
6.4. Engagement and Reflection ............................................................................ 95
6.5. The work that art does .................................................................................... 96
6.6. Technology and human experience ................................................................. 98
6.7. The role of art in a changing technological world ......................................... 99
6.8. Four principles of the framework .................................................................... 102
6.9. David Rokeby .................................................................................................. 103
6.10. Similarities between Dewey and Rokeby ....................................................... 104
6.11. Control ............................................................................................................ 105
6.12. Complexity ..................................................................................................... 107
6.13. Mirroring ........................................................................................................ 110
6.14. Summary of the framework .......................................................................... 111
## CHAPTER 7 METHODOLOGY

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1. The process of interaction design</td>
<td>115</td>
</tr>
<tr>
<td>7.2. Capturing experience</td>
<td>115</td>
</tr>
<tr>
<td>7.2.1. Definition of experience</td>
<td>116</td>
</tr>
<tr>
<td>7.2.2. Artistic context</td>
<td>118</td>
</tr>
<tr>
<td>7.3. Beta_space</td>
<td>119</td>
</tr>
<tr>
<td>7.3.1. Partnership with the Powerhouse Museum</td>
<td>121</td>
</tr>
<tr>
<td>7.3.2. “Living laboratories” in ICT innovation</td>
<td>122</td>
</tr>
<tr>
<td>7.4. Experiential Goals</td>
<td>122</td>
</tr>
<tr>
<td>7.5. Personas and Scenarios</td>
<td>123</td>
</tr>
<tr>
<td>7.5.1. The development of the Personas: Bystander pilot study</td>
<td>124</td>
</tr>
<tr>
<td>7.5.2. Personas and Scenarios in the case studies</td>
<td>126</td>
</tr>
<tr>
<td>7.6. Prototyping</td>
<td>127</td>
</tr>
<tr>
<td>7.7. Experience Workshops</td>
<td>129</td>
</tr>
<tr>
<td>7.7.1. Developing the Experience Workshop method</td>
<td>130</td>
</tr>
<tr>
<td>7.8. Video-cued Recall</td>
<td>131</td>
</tr>
<tr>
<td>7.8.1. Developing Video-cued Recall: Iamascope pilot study</td>
<td>132</td>
</tr>
<tr>
<td>7.8.2. Video-cued Recall Process</td>
<td>134</td>
</tr>
<tr>
<td>7.9. Semi-structured Interviews</td>
<td>135</td>
</tr>
<tr>
<td>7.9.1. Interview script</td>
<td>135</td>
</tr>
<tr>
<td>7.9.2. Interview process</td>
<td>136</td>
</tr>
<tr>
<td>7.10. Ethical issues</td>
<td>137</td>
</tr>
<tr>
<td>7.11. Data analysis</td>
<td>137</td>
</tr>
<tr>
<td>7.11.1. Transcription</td>
<td>138</td>
</tr>
<tr>
<td>7.11.2. Meaning categorisation</td>
<td>138</td>
</tr>
<tr>
<td>7.11.3. Interpretation</td>
<td>139</td>
</tr>
<tr>
<td>7.12. Conclusion: An experiential approach to curating interactive art</td>
<td>140</td>
</tr>
</tbody>
</table>

## CHAPTER 8 CARDIOMORPHOLOGIES, BY GEORGE KHUT

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1. Description of Cardiomorphologies</td>
<td>142</td>
</tr>
<tr>
<td>8.2. George Khut and the background of Cardiomorphologies</td>
<td>143</td>
</tr>
<tr>
<td>8.3. Background of the collaboration</td>
<td>145</td>
</tr>
<tr>
<td>8.4. Overview of process of making and exhibiting Cardiomorphologies</td>
<td>147</td>
</tr>
<tr>
<td>8.5. Experiential Goals</td>
<td>148</td>
</tr>
<tr>
<td>8.6. Personas and Scenarios</td>
<td>149</td>
</tr>
<tr>
<td>8.7. Prototype</td>
<td>152</td>
</tr>
<tr>
<td>8.8. Recording audience experience of the prototype</td>
<td>155</td>
</tr>
<tr>
<td>8.8.1. Experience Workshops</td>
<td>155</td>
</tr>
<tr>
<td>8.8.2. Video-cued Recall</td>
<td>158</td>
</tr>
<tr>
<td>8.9. Analysis of the audience experiences of the prototype using the experiential goals</td>
<td>161</td>
</tr>
<tr>
<td>8.10. Development of the final iteration</td>
<td>167</td>
</tr>
</tbody>
</table>
8.11. Recording audience experience of the final iteration ........................................ 170
8.12. The aesthetic experience of *Cardiomorphologies* ........................................ 173
  8.12.1. Control ........................................ 173
  8.12.2. Complexity .................................... 176
  8.12.3. Mirroring ....................................... 178

CHAPTER 9 REJECTION ON THE DEVELOPMENT OF CURATORIAL PRACTICE IN *CARDIOMORPHOLOGIES* ......................................................... 181

  9.1. Evaluation of the methods used ................................................................. 182
    9.1.1. Experiential Goals .............................................................................. 182
    9.1.2. Personas and Scenarios ....................................................................... 183
    9.1.3. Experience Workshop ........................................................................ 183
    9.1.4. Video-cued Recall .............................................................................. 184
  9.2. Characteristics of the experiential approach to curating interactive art ........ 185
    9.2.1. Working with audience experience as a material ................................ 186
    9.2.2. The dialogue between “real” and “ideal” .......................................... 187
    9.2.3. Collaboration between artist and curator .......................................... 189

CHAPTER 10 CONTAGION BY GINA CZARNECKI ...................................................... 191

  10.1. Description of *Contagion* ....................................................................... 192
  10.2. Gina Czarnecki and the background of *Contagion* ................................. 193
  10.3. Background of the collaboration ............................................................... 196
  10.4. Overview of the process of making and exhibiting *Contagion* ................. 197
  10.5. Starting point ............................................................................................ 199
  10.6. Experiential Goals ................................................................................. 200
  10.7. Personas and Scenarios ............................................................................ 203
  10.8. Prototype .................................................................................................. 204
    10.8.1. Description of the prototype ............................................................... 205
    10.8.2. Rationale for the prototype ................................................................. 207
  10.9. Audience experience of the prototype ..................................................... 209
    10.9.1. Experience Workshop ........................................................................ 209
    10.9.2. Video-cued Recall ............................................................................. 212
  10.10. Semi-structured Interviews .................................................................... 214
  10.11. Analysis of the audience experiences using experiential goals ............... 217
  10.12. Development of the final iteration .......................................................... 226
  10.13. Audience experience in the final iteration ............................................. 229
  10.14. The aesthetics of interaction in *Contagion* .......................................... 231
    10.14.1. Engagement and Reflection in *Contagion* ...................................... 231
    10.14.2. Control ............................................................................................ 232
    10.14.3. Complexity ...................................................................................... 236
    10.14.4. Mirroring ......................................................................................... 238
    10.14.5. Conclusion: The role of difficulty in audience experience ............... 240
CHAPTER 11 REFLECTION ON THE DEVELOPMENT OF CURATORIAL PRACTICE IN CONTAGION

11.1. Introduction ........................................................................................................... 244
11.2. Evaluation of the methods used ............................................................................ 244
   11.2.1. Experiential Goals ......................................................................................... 244
   11.2.2. Personas and Scenarios ............................................................................... 245
   11.2.3. Prototype exhibition .................................................................................... 246
   11.2.4. Experience Workshop ................................................................................. 247
   11.2.5. Video-cued Recall ....................................................................................... 248
   11.2.6. Semi-structured Interviews ....................................................................... 249
11.3. Characteristics of the experiential approach to curating interactive art ............. 249
   11.3.1. Audience experience as a unifying focus in complex projects ................. 249
   11.3.2. Audience experience in moving from concept to implementation ............. 251
   11.3.3. Exhibiting artistic prototypes ..................................................................... 253

CHAPTER 12 CONSOLIDATED RESULTS ......................................................................... 257

12.1. Overview .............................................................................................................. 258
12.2. An experiential approach to curating interactive art .......................................... 258
   12.2.1. Evaluation of methods ................................................................................ 259
   12.2.2. Characteristics of the approach ................................................................. 260
12.3. A critical framework for the experience of interactive art ................................ 262
   12.3.1. Control ........................................................................................................ 263
   12.3.2. Complexity .................................................................................................. 264
   12.3.3. Mirroring ...................................................................................................... 265
   12.3.4. “Cultivating difficulty” in interactive art.................................................... 266

CHAPTER 13 CONCLUSIONS AND FUTURE WORK ....................................................... 268

13.1. Overview .............................................................................................................. 269
13.2. How the research questions were addressed....................................................... 270
13.3. Contributions of the thesis ................................................................................. 272
   13.3.1. An experiential approach to curating interactive art ................................... 272
   13.3.2. A critical framework for the experience of interactive art ......................... 273
13.4. Future work ......................................................................................................... 273
   13.4.1. Group exhibitions ....................................................................................... 274
   13.4.2. Documenting experience ........................................................................... 275

REFERENCES ................................................................................................................. 278

APPENDICES ................................................................................................................ 296
List of Figures

Figure 1 Cybernetic Serendipity at the ICA, 1968 ................................................................. 41
Figure 2 Cornock and Edmonds’ taxonomy of interactive possibilities .................. 44
Figure 3 Simple lifecycle model of interaction design (Preece et al. 2002) ............ 116
Figure 4 Beta_space in the Powerhouse Museum, Sydney ................................................. 120
Figure 5 Cardiomorphologies final iteration ............................................................... 142
Figure 6 Cardiomorphologies v.1 (2004) ....................................................................... 146
Figure 7 Cardiomorphologies prototype ‘Cross Mode’ and ‘Rings Mode’ .............. 154
Figure 8 Cardiomorphologies prototype ‘Spectral Graph’ ........................................... 154
Figure 9 Cardiomorphologies prototype set-up ......................................................... 155
Figure 10 Experience Workshop responses against Experiential Goals ................. 158
Figure 11 Cardiomorphologies final visualisations ...................................................... 168
Figure 12 Cardiomorphologies final iteration sensors ............................................... 169
Figure 13 Contagion final iteration ............................................................................... 193
Figure 14 Contagion final iteration ............................................................................... 193
Figure 15 Contagion prototype exhibition ................................................................. 205
Figure 16 Contagion prototype Mirror ........................................................................ 206
Figure 17 Contagion prototype Colour Palette ......................................................... 207
Figure 18 Contagion prototype Face ........................................................................... 207
Figure 19 Experience Workshop responses against Experiential Goals ................. 210
Figure 20 Contagion final iteration screen shot ....................................................... 227
List of Tables

Table 1 Structure of a creative-production research project against a summary of my research activities and the corresponding parts of the thesis .... 36

Table 2 Overview of methods used in this study against the four activities of interaction design ........................................................................................................... 117

Table 3 Timeline and methods used in Cardiomorphologies. ........................................ 148

Table 4 Experience Workshop summary of responses ..................................................... 157

Table 5 Cardiomorphologies prototype Video-cued Recall participants ....................... 160

Table 6 Cardiomorphologies Video-cued Recall participants ...................................... 172

Table 7 Timeline and methods used for Contagion ...................................................... 200

Table 8 Summary of Experience Workshop responses ................................................ 212

Table 9 Contagion prototype Video-cued Recall participants ....................................... 214

Table 10 Contagion prototype Semi-structured Interview participants .......................... 217

Table 11 Contagion Semi-structured Interview participants ....................................... 231

Table 12 Summary evaluation of the methods used ...................................................... 261
List of Appendices

Appendix A  Enclosed video documentation – DVD track listing .............................................. 297
Appendix B  Sample research participant consent form .............................................................. 298
Appendix C  Cardiomorphologies visitor information card ...................................................... 299
Appendix D  Cardiomorphologies At Beta_space publicity material ............................................ 300
Appendix E  Sample Of Cardiomorphologies Video-Cued Recall Report abridged transcription (Lynn). ........................................................................................................... 301
Appendix F  ‘Evolving Creative Practice’ : Conference paper based on joint reflection with George Khut (Khut & Muller 2005). ................................................................. 303
Appendix G  Contagion signage .................................................................................................. 315
Appendix H  Sample of Contagion prototype Semi-Structured Interview abridged transcription (Geoff) ....................................................................................................... 316
Appendix I  Interview between Elizabeth Muller and Gina Czarnecki April 2006 edited transcript ...................................................................................................................... 319
Foreword

The motivation for this research project grew from my experience as a curator exhibiting new media and interactive artworks between 1999 and 2004. Each time I organised an exhibition I was struck by the way the artworks came to life with the entrance of the audience. I was fascinated by people's reactions and behaviour, their unexpected uses, and creative mis-uses of the artworks, their preferences and curiosities, their questions and conversations. Meanwhile, I was increasingly aware of two problems which I perceived in the field of interactive art.

The first was the prevalence of disappointing interactive artworks. I had encountered enough rewarding and satisfying work to convince me that, used well, computer-based interactivity produced compelling aesthetic experiences. However I had also encountered numerous artworks where I felt the potential of the interactive situation was not being fully exploited.

The second problem was the way interactive art was written about in artists' documentation, in marketing materials, and in the growing body of critical literature. Descriptions of work seemed to focus largely on the technology and often implied, it seemed to me, that the more "cutting edge" the technology the better the artwork. The term "interactive" was used so generally that it was practically meaningless. There seemed to be a lack of adequate critical and descriptive language to talk about the nature and qualities of the different kinds of interaction offered by different artworks. I felt that these two problems could be addressed by a closer consideration of the audience's reactions to the works. Was it possible, I wondered, to develop my own interest in audiences into a more robust and methodical basis for my curatorial practice? Was it possible to connect artists making interactive artwork to the rich and fascinating "resource" of the audience's encounter with the work? Was it possible to bring some of the liveliness of real audience experiences into the critical discourse surrounding interactive art?

In 2003 I initiated a project called the New Technology Arts Fellowship (NTAF) in partnership with the Crucible research network for interdisciplinary design led by Alan Blackwell. Blackwell brought me into contact for the first time with Human Computer Interaction (HCI), an interdisciplinary field that focuses on the encounter between people and computer systems. Our collaboration opened up new possibilities for developing my interest in audiences. The project brokered three partnerships between artists and technology researchers at Cambridge University in England, with the aim of stimulating the creation of new interactive artworks (Leach
One aim of the project was to find ways to include audiences in the collaborations. Inspired by the HCI techniques of user-testing and prototyping which I had recently discovered, I organised a work in progress "exposition" with our partner gallery, Kettle's Yard. The artists and technologists found ways to show early versions of the ideas they were working on to the audience. We framed the overall event as a research experiment, in which audiences were invited to contribute to the ongoing development of the works. I was interested to find out how audiences would respond to this unusual use of the gallery. By talking to visitors and watching their behaviour I discovered that most audience members were very open to this experimental and process-based form of exhibition. They readily grasped the idea that the objects in the gallery were not finished works, and seemed keen to give feedback and discuss the research processes represented in the space. The experiment also proved valuable for the artists, who were interested to see how audiences reacted to their ideas and engaged with the things they had made. The success of this early experiment persuaded me that the field of HCI would reward closer attention, and became the motivating factor behind this research. In the thesis that follows I show how my engagement with HCI has generated new possibilities for curatorial practice, as well as new ways of understanding and talking about the aesthetic effects of computer-based interaction in art.