

School of Media, Culture and Creative Arts  
Department of Internet Studies

Professional web design and interactivity:  
a study of web designers' understanding  
and practice of interactivity

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# Declaration

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgement has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

Signature:

A handwritten signature in black ink, appearing to read "N. Wray." The signature is written in a cursive style with a prominent initial "N" and a trailing flourish.

Date: October 2012



# Abstract

This thesis analyses interactivity in web design, focussing on the everyday design practices of Australian web designers. Interactivity is a highly contested term. Asking the question 'What is interactivity?' brings into play a complex level of contextual understandings of the term from diverse fields of practice.

The latest findings show that after a decade of web design, designers are yet to articulate a definition or perception of interactivity. While they have a sophisticated practical understanding of interactivity, discussion that has occurred within the design community has focussed mainly on interactivity as an interface or navigation method. This approach addresses only a small aspect of a broad and, at times, elusive concept, and it is based on too simplistic a representation of interactivity.

This study discusses the development of communication design as its own distinct practice, and how this has influenced professional practise and its approach to the web. It begins by reviewing various theoretical approaches to interactivity from outside the design community. It then presents the findings from interviews with web designers and an analysis of their websites. The study concludes by demonstrating that interactivity has no abstract definition but is multi-dimensional and inherent in the many ways that designers think about and apply the principles of design to the web.



# Table of Contents

Abstract	v
Acknowledgements	xiii
<b>1   Introduction</b>	<b>1</b>
1.1 Introduction	1
1.2 Design, interactivity and the web	3
1.3 Research questions	8
1.4 Summary of research methods	9
1.5 Organisation of the thesis	9
1.6 Conclusion	12
<b>2   Understanding communication design</b>	<b>13</b>
2.1 Introduction	13
2.2 Mapping the practice of visual communication	14
2.2.1 Historical context of communication design	14
2.2.2 Purpose, medium and form	17
2.2.3 The digital revolution	21
2.2.4 Changing notions of good design	23
2.2.5 Shifting practice: graphic design in the 1990s	26
2.2.6 Conclusion	27
2.3 Communication design	27
2.3.1 What is communication design?	28
2.3.2 Problems with name changes	29
2.3.3 Establishing a critical theory of communication design	30
2.3.4 Communication design, new technologies and interactivity	32
2.3.5 Digital technologies: changing the reader into a user	34
2.3.6 Conclusion	36
2.4 Conclusion	37

3   Defining interactivity	38
3.1 Introduction	38
3.2 Design and the web	39
3.2.1 Interactive technologies and the web	40
3.2.2 Designers and the web	42
3.2.3 Commercial design practice for the web	45
3.2.4 The web and interactivity	47
3.2.5 Articulating web design	48
3.2.6 Conclusion	52
3.3 Different contexts of interactivity	53
3.3.1 A human-computer interaction perspective	54
3.3.2 Communication theory	57
3.3.3 Interaction design	62
3.3.4 Comparisons between the three perspectives	66
3.3.5 Networked computing and contrasting views	68
3.3.6 Conclusion	69
3.4 Towards a theory of interactivity	70
3.4.1 Features of interactivity	70
3.4.2 The web and practices of interactivity	75
3.5 Conclusion	76
4   Research Methods	78
4.1 Introduction	78
4.2 Research philosophies	79
4.2.1 Qualitative versus quantitative methods	80
4.2.2 A grounded theory approach	81
4.3 Research design	83
4.3.1 Interviews	86
4.3.2 Diagrams	87
4.3.3 Websites	88
4.3.4 Conclusion	89

4.4	Data collection	90
4.5	Analysis of data	93
4.6	Constraints of the study	99
4.7	Conclusion	102
<b>5  </b>	<b>How do designers speak about interactivity?</b>	<b>103</b>
5.1	Introduction	103
5.2	How do designers understand interactivity and the web?	104
5.3	Who are the users of web design?	107
5.4	What is the purpose of design for the web?	112
5.5	How do designers speak of interactive functionality?	115
5.6	What are the constraints within which the designer works?	117
5.7	How do designers speak of the conventions of web design?	120
5.8	How do designers create concepts and design for the web?	122
5.9	Conclusion	124
<b>6  </b>	<b>How do designers visualise interactivity?</b>	<b>128</b>
6.1	Introduction	128
6.2	How do designers visualise interactivity and the web?	133
6.3	How do designers visualise the user?	138
6.4	How do designers visualise the purpose of design for the web?	140
6.5	How do designers visualise interactive functionality?	143
6.6	Are the constraints within which designers work visualised?	149
6.7	How do designers visualise web conventions?	151
6.8	How do designers visualise concepts and design for the web?	153
6.9	Conclusion	156
<b>7  </b>	<b>How do designers employ interactivity in web design?</b>	<b>159</b>
7.1	Introduction	159
7.2	What are the main factors of interactivity evident in the sample websites?	159

7.3 Who are the users of the sample websites?	171
7.4 Does the purpose of a website affect its design?	174
7.5 Is interactive functionality evident in web design?	177
7.6 Are perceived constraints identifiable in the sample websites?	184
7.7 Can web conventions be identified in the sample websites?	186
7.8 Examining how concepts are realised in web design	189
7.9 Conclusion	191
<b>8   Conclusion</b>	<b>194</b>
8.1   Introduction	194
8.2   Designers' concepts of interactivity	194
8.3   Theory and practice	198
8.4   Interactive literacy	201
8.5   The practise of good design for the web	204
8.6   Concluding remarks	205
<b>Appendices</b>	<b>207</b>
Appendix 1: Glossary	208
Appendix 2: Graphic design timeline	210
Appendix 3: Interview schedule	211
Appendix 4: Protocol tools	214
<b>References</b>	<b>218</b>

## List of Figures

Figure 3.1: Saffer's definition of interaction design	67
Figure 4.1: Key dimensions of interactivity	95
Figure 4.2: Identifying and classifying	95
Figure 4.3: Questioning the data	97
Figure 6.1: Interactivity simplified	129
Figure 6.2: Emotion in interactivity	129
Figure 6.3: Experiential interactivity	130
Figure 6.4: Immersive interactivity	130
Figure 6.5: Levels of interactivity	131
Figure 6.6: Interactivity as a definition	131
Figure 6.7: Interactivity as a feedback loop	132
Figure 6.8: Interactivity that facilitates interaction	132
Figure 6.9: Interactivity as a mind map	133
Figure 6.10: Defining interactivity within the context of the web	134
Figure 6.11: Interactivity as a non-linear journey	135
Figure 6.12: Connections in the visual definition	136
Figure 6.13: Connecting cognition with interactivity in feedback loop	137
Figure 6.14: Visualisations of the user	139
Figure 6.15: Interactive functionality facilitating multiple options	145
Figure 6.16: Interactive functionality facilitating changing emotional state of user	145
Figure 6.17: Interactive functionality facilitating exploration	145
Figure 6.18: Interactive functionality facilitating connectivity and a sense of presence	146
Figure 6.19: Interactive functionality facilitating communication	146
Figure 6.20: Interactive functionality facilitating reciprocal communication and responsive system	146
Figure 6.21: Interactive functionality facilitating the intersection of users worldwide through the web	147
Figure 6.22: Interactive functionality facilitating convergence	147
Figure 6.23: Interactive functionality facilitating an infrastructure	148
Figure 6.24: Working within a screen paradigm	150
Figure 6.25: Familiar visual language	151
Figure 6.26: Visual language born of web design	152

Figure 7.1: Profile of the sample websites	162
Figure 7.2: Factors constituting the theme of intuitiveness	162
Figure 7.3: Focus on the theme of intuitiveness	163
Figure 7.4: Factors constituting the theme of feedback	164
Figure 7.5: Focus on the theme of feedback	164
Figure 7.6: Factors constituting the theme of responsiveness	165
Figure 7.7: Focus on the theme of responsiveness	165
Figure 7.8: Factors constituting the theme of experience	166
Figure 7.9: Focus on the theme of experience	167
Figure 7.10: Factors constituting the theme of communication	168
Figure 7.11: Focus on the theme of communication	169
Figure 7.12: Factors constituting the theme of enablement	170
Figure 7.13: Focus on the theme of enablement	170
Figure 7.14: Identifying user groups	172
Figure 7.15: Factors constituting the theme of the user	173
Figure 7.16: Website intention	175
Figure 7.17: Relationships between the factors of experience	176
Figure 7.18: Interactive functionality within intuitiveness	178
Figure 7.19: Interactive functionality within feedback	179
Figure 7.20: Interactive functionality within responsiveness	180
Figure 7.21: Interactive functionality within experience	181
Figure 7.22: Interactive functionality within communication	182
Figure 7.23: Interactive functionality within enablement	183
Figure 7.24: Identifying conventions in intuitiveness	186
Figure 7.25: Identifying conventions in feedback	187
Figure 7.26: Identifying conventions in responsiveness	187
Figure 7.27: Identifying conventions in experience	188
Figure 7.28: Identifying conventions in communication	188
Figure 7.29: Identifying conventions in enablement	189
Figure 7.30: Design considerations in concept development	190

## List of Tables

Table 4.1: Methods used to gather data	91
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# 1 | Introduction

## 1.1 Introduction

This thesis explores the way in which interactivity is understood and practised within contemporary web design, and how web design can be understood as a form of communication. Interactivity is a complex phenomenon, especially within the broad field of design. Both design and the specific aspects of design that produce interactivity have been described as omnipresent, yet transparent, within contemporary culture. Such a description is based, however, on a lack of clear definitions, which often reflects disjunctions between theory and practise. The business and practice of web design have grown rapidly over the past two decades. They have introduced many new challenges and considerations for the communication designer, while at the same time coming to dominate the way in which interactivity is enacted. To date, communication designers have not clearly articulated their understanding of interactivity, or how this perception informs their practice. Furthermore, while designers remain influential in shaping the cultures, uses and overall design of the web, the lack of clarity about how they use interactivity and perceive its relationship to the broader demands of communications design continues to hamper the effective development of computer-mediated systems. This study poses the question, ‘What does interactivity mean within the everyday practice of web design?’, and seeks to answer it through close analysis of the perceptions, practices and conceptualisations of contemporary web designers.

This question is more complex than it might first appear. As will become apparent throughout this thesis, terms such as design and interactivity have many meanings and uses in the work of theorists and researchers, as well as in the everyday world of designers. In many ways the challenge in understanding web design and interactivity emerges from the lack of an agreed or consistent language with which to make sense of the word. While this thesis will engage closely with the way design and interactivity have been discussed historically, its focus is on an empirical investigation of the actual practices of interactivity and web design. Using a sample of Australian professional web designers, this thesis will investigate the enactments of design, rather than its abstract description. The conclusion, of course, will not establish the ‘truth’ of interactivity for web designers. It will, however demonstrate how these messy, yet vital, concepts are implemented in design practice.

Central to this thesis is the concept of communication design, which has recently emerged as a way of understanding all the separate aspects of design. Communication design asserts that design is more than just the provision of ‘eye candy’ or ‘surface decoration’ (Blevis *et al.*, 2006; Forlizzi *et al.*, 2008). Rather, design is about finding ways to make human interaction more effective, whether it is through the interaction between humans and computers, or between computers themselves. The primary aim of this thesis is to understand how web designers think about interactivity and implement their perceptions in web design. However, such an understanding can only be achieved by recognising how a designer’s use of interactivity allows their design to be considered ‘communication design’.

My interest in this question emerged from my experience as a designer and design educator. I have experienced the shifts in design practice that have occurred as the internet has become more and more central to everyday life, design and communication. Like the designers in this study, I was excited by the web’s potential for new forms of expression and interactive media, and it seemed that it would offer a direct connection between the designer and the user. Some of the many possibilities first imagined for the web have been realised and some have not. In particular, the complex intersection of traditions of graphic design, recent developments in multimedia design and the overarching move towards communication design have provided a confusing array of approaches to the web, making it hard to specify the exact purpose of web design and how communication is implemented across multiple dimensions.

When the web first became popular, many designers thought multimedia design was closely aligned with the web, while others saw it as a natural progression from print media. This view was influenced by the origins of the web as a system of information exchange. While some sections of the design community discussed the web’s potential for interactive media, others did not fully appreciate the opportunities the web presented for communication design; reasons being the diversity of practice that had grown exponentially since the 1980s and the perceived limitations of the web. Over a decade on, the web has undergone rapid changes and initial perceptions of it as being an iteration of print or interactive CD ROMs has changed as technological advances make website design less restrictive.

This introductory chapter will establish the context for the research described in this study. It will explore the background to the study and state the research questions. It will then provide an overview of the chapters. A focus of this chapter is understanding the meaning of the terms ‘design’ and ‘interactivity’ for communication design, in order to establish the interrelationship between these

two areas in the context of web design. Much of the complexity of both areas stems from a lack of coherency in terminology and perception, which creates the need for clarification within different professional contexts.

## 1.2 | Design, interactivity and the web

Design is everpresent in the contemporary world, and it is used as a broad term in relation to activities, artefacts, systems and services throughout present-day culture (Kalman *et al.*, 1994; Heskett, 2002; Kalman, 2002; Cato, 2011; Helfand, 2007; Ashton in Twemlow, 2006). It is also a term that covers a range of professional services. Mau (2004) contends that designers strive to achieve design that is ubiquitous, the outcomes of which intersect with people's lives in a meaningful way that enhance the social environment. For Mau, design is invisible unless it fails (Mau, 2004). The term 'design' is difficult to qualify, as it is used in reference to diverse activities across the sciences, arts and humanities (Heskett, 2002; Kotamraju, 2001; Mau, 2004). Friedman (2000) asserts that the design of tools, which adapt our environment, is what makes us human. Heskett (2002) also claims that the capacity to design is the distinction between humans and other species. People seek to improve their surrounds through design activity, and as such both Friedman and Heskett imply that design is instinctive. If design is an innate capacity, then this explains, to some degree, the challenge involved in defining what design is, and in differentiating between an instinctive act and the considered actions and decisions of the professional designer.

Simon (1982) defined design as an activity that involves devising systems and which seeks to change existing situations into preferred ones. Haythornthwaite (2010) describes the practice of design as 'broad-mindedly narrow' in that it can apply to many situations across diverse professions, but also describes a very specific approach to problem solving. In both the academic literature and popular press, definitions of the nature and purpose of design vary according to who is explaining the term. Forty (1986) sees it as highly problematic that designers in specific fields of design practice define design on the basis of their own practice as if it were applicable to all design.

There is an extensive body of literature that theorises the nature and purpose of practices with respect to maintenance of the social order and the scope of human agency action, whether it be purpose-oriented or norm-oriented (Reckwitz, 2002). Practice theory holds that the daily routines of the designer in exercising their craft are a key vehicle for the transmission of tacit knowledge and skills, but also for their progressive reformulation. Designers' practice constitutes a purposeful, norm-oriented activity through which they express their understanding of their practice. Intertwined in the

literature of practice theory are social and cultural theories, such as those of Bourdieu, Giddens, Taylor and the late work of Foucault, which hold that practices themselves, not the individuals who carry them out or the social contexts in which they perform them should be the primary object of analysis (Reckwitz, 2002). This thesis explores the practice of designers from the pragmatic perspective of what their practices reveal, that is, their engagement in doing, rather than from a philosophical perspective. It acknowledges that designers engage in creative action and decision-making to identify and respond to clients' commercial communication needs, but that design knowledge and technical skills regarding interactivity are largely developed by carrying out the various activities and tasks that the practice requires.

Crucially, practice theory suggests that it is by engagement in practice that individuals come to understand the context for doing and their role and identity within it. The variety of explanations for interactivity suggests the difficulty designers have had in reducing the richness and scope of their practice to a single theory that expresses the essence of web design. That said, there is a cogency to the practice of web design that indicates the presence of common goals and understandings, and which is open to analysis in the aim of theorising what communication designers understand interactivity in the context of web design to be.

Commercial design practice emerged during the Industrial Revolution, its evolution and progression intertwined with technological advancements. The rise of computing in the 1980s and the subsequent emergence of the web in the mid-1990s ushered in changes to the practice of the field then known as graphic design. In the wake of new interactive media formats and software, the practice of graphic design divided into those designers working with print and those working with screens. The new practice of design for the screen, initially termed multimedia design, saw some graphic designers apply their knowledge and experience to time-based media, such as interactive CD-ROMs, motion graphics and interactive kiosks. Following the division between graphic design and multimedia design, there was a perception in the late 1990s that the term 'graphic design' was limited and did not reflect how the practice would evolve in conjunction with future technological advances. A shift in some sections of the design community from the term graphic design to the term 'communication design' was deemed appropriate (ICOGRA, 2000), because it reflected communication needs in the expanding digital landscape. This development was not universal, however, and it has created some confusion through the implication that graphic design, multimedia design and communication design are different, whereas in fact these are often overlapping practices or, indeed, subsets of communication design.

In the 1990s, graphic designers saw their practice as transferable to design for screen-based media. This perception continued with the emergence of the web,

despite the fact that the web possessed different qualities and behaviours to the new media. New media was a title used to describe the differences between print-based media and interactive screen-based media. It was assumed by some of the design community that interactivity had more synergies with the practice of multimedia design, as this involved working with interactive space even though some designers viewed it as a natural progression from print as well. In the context of the web, many multimedia designers were perceived as coders. The term communication design was seen as a new term for the existing practice of graphic design. To suggest there was a clear delineation between graphic design, multimedia design and communication design after the emergence of new media and the web is not accurate and has resulted in diverse perceptions and approaches to design for an interactive space.

Some designers perceived the rise of the web as validating the change in term from graphic design to communication design, but in reality it further confused the scope of practice across the areas of graphic, multimedia and communication design. Graphic designers viewed the web as an extension of print. Multimedia designers perceived the web as relating to the interactive work that they had undertaken in new media formats. From the outset, design for the web challenged the graphic design community to embrace and understand the new features that distinguished it from practice in established graphic design contexts. Graphic designers were largely hampered in their response by their experience in design for print and their lack of new technological skills. They struggled to transfer their existing knowledge into the new electronic medium, resulting in the development of a rather narrow perception of design for the web that focussed on a graphical look without considering functional or behavioural aspects of the web (Engholm, 2002; Heeter, 2000). Multimedia designers, already working with new digital technologies, were technically equipped to deliver their interactive multimedia projects via the web, but they were frustrated by low bandwidth and download speeds in the 1990s. Furthermore, they struggled to grasp the networked communication potential of the internet. Graphic designers were viewed as not having the requisite knowledge to develop effective and usable websites. Multimedia designers were seen as developing gimmicky, inefficient websites that failed to capitalise on the networks and connectivity qualities of the web, reflecting older ideas about disk-based media. In both cases, what might have been lacking was a strong appreciation of skills in communication design, which both graphic and multimedia designers possessed, and which were actually the skills they needed online.

Prior to the emergence of the web, interaction and interactivity were concepts familiar to designers, but not in the way it might now be understood. Designers understood interaction in terms of audiences engaging with designed communications or artefacts in some way. Equally, interactivity was part of the

repertoire of design practice. Following the launch of the Apple Macintosh computer (henceforth, the Macintosh) in 1984, interactive tools have underpinned graphic design practice, changing the ways in which designers work. Yet despite the prevalence of the idea of audience interaction with works of design as a desired outcome, the term interactivity was rarely discussed in the literature of graphic design. It was not until the emergence of the World Wide Web (henceforth, the web) in the mid-1990s that interactivity became explicitly part of the problems and opportunities of design.

Throughout the first decade of the web, graphic designers' voices were largely absent from the scholarly discourse of interactivity, resulting in a lack of insight into graphic design's practical contribution to interactive web development and production. Designers have discussed the challenges of designing for new digital mediums within the design community, through magazines such as *Emigre* (1984–2005), *Eye* (1990–2012), the *Looking Closer* series of anthologies (1994–2006) and, more recently, design blogs such as *Design Observer* (2003–2012), *Australian in Front* (1999–2012), *Voice: AIGA Journal of Design* (2004–2012), and *The Daily Heller* (2008–2012). In these forums, designers have begun to explore, as a community, the practice of web design. Still, these commentators have struggled to articulate a concept of interactivity for the web, with most writing focussed on the designer, the designed artefact and the design process. In contrast, scholarly literature highlights sparse discussion on the practice of web design within communication design, designers' perceptions of interactivity, the nature of interactive literacy, and what qualifies as 'good design' within an interactive context.

For designers, knowledge of interactivity has evolved in a practical context through a process of doing. To date there has been little need to articulate or theorise it. Asking the question 'What is interactivity?' prompts an array of different understandings from a variety of fields. Some writers argue that it refers to a 'style of control' (Guedj *et al.*, 1980). Others explore it as a process, feature, or perception (McMillan & Hwang, 2002), and within the context of a process, numerous models have been explored (Stromer-Galley, 2004; Bucy, 2004; Crawford, 2005; McMillan, 2006). Early definitions of interactivity emerged in the 1980s, when information exchange and user control were seen as its main characteristics. Senders and receivers could exchange roles and thus assume reciprocal control of a communication. With rapid technological advances, interactivity became associated with additional roles and functions beyond information control and exchange. For example, writers identified interactivity as the core characteristic making new media new (McMillan, 2006).

Part of the challenge in defining and theorising interactivity is that it occurs in a variety of contexts. For example, the field of Human Computer Interaction (henceforth HCI) looks at interactivity from a technological and practical perspective;

communication theory examines interactivity from the perspective of information patterns, distribution and the implications for the user and society; and interaction designers work with the concept from a human perspective or the needs of a paying client. Because interactivity is considered differently in different contexts, we face the problem of researchers defining it in context-specific ways that are not always consistent with other uses or definitions of the term. There are similarities between definitions, but they also vary, resulting in what Bucy (2004) calls a preoccupation with definition.

The history of interactivity is interwoven with the development of technology, and the nature and purpose of interactivity is therefore in a constant state of flux. Although the term emerged as a mainstream concept in the 1980s, the idea and experience of interactivity predated this period with the inventions of the telegraph, telephone, fax and radio – media formats that enabled a two-way flow of information within a responsive system. Interactivity lay at the heart of the imagined Memex (Bush, 1945) and was a key concept in the development of hypertext, a term coined in 1963 by Ted Nelson (Saffer, 2010). Interactivity remains a term where the definition is subject to change. As a central component of new technologies, interactivity continues to facilitate new types of interactions through different and everchanging networked devices. In context of the web, McMillan and Hwang (2002) argue that scholars have conceptualised interactivity as a process, function and perception, with most studies focussing on process and function. Because perceived interactivity is an important but underexplored area of study in terms of professional web design, this thesis will examine designers' perceptions of interactivity.

To date, most web research has focussed on the user, communication, and the social and cultural implications of the web. In the short space of time since its emergence in the mid-1990s, the web has had a dramatic impact on the way in which people receive and use information and the way organisations communicate with their stakeholders and the public. The nature and purpose of individualised or globalised communications enabled by the web are now very different to earlier mass or broadcast communication models. New media and later the web have allowed new and hybrid forms of communication to evolve (Bezjian-Avery, *et al.*, 1998; Livingstone, 2004). For professional web designers, understanding interactivity in theory and in practice, as well as its implications for the user, is critical for designing websites that engage, are usable and communicate effectively. Considerations of interactivity within the professional web design community have tended to focus on interactivity as a matter of interface or navigation (Bonsiepi, 1999). This approach is narrow and simplistic, addressing just one small aspect of what is a broad and often elusive concept. Although there is increasing familiarity with and use of the term in public forums (Sankarayya 2011; Bonds,

2011), there has been little research into how professional designers think about interactivity and implement their understandings in the practice of web design. Having established the context for this study, I will now present in detail the research questions, methods used to gather data, and the overall structure of the thesis.

### 1.3 | Research questions

Designers have been working to communicate via the web for nearly two decades, developing different approaches and varied expectations about what the web should be, how it should behave and how users should engage with it. Alternative and competing approaches and expectations have been introduced by computer scientists and other communicators, who were guided by different paradigms to those familiar to designers. For all concerned, however, interactivity – however defined, however implemented – has come to denote the key experience of using the web for communications, whether designed as such or not.

With rapid technological change, web designers have become more familiar with the potential of interactivity in their design activities, and have contributed to shaping the web. However, after two decades of working with the web, communication designers are still yet to develop a theory and philosophical perspective of interactivity. Of further interest are the principles of interactivity that designers use in their daily practice. How have they developed awareness, whether tacit or explicit, of the synergies of interactivity and web design? If they are yet to develop a theoretical framework, how has their understanding and use of interactivity evolved? This thesis contributes to the current debate on interactivity by examining how professional designers for the web understand and implement their concept of interactivity in web design. A literature review and analysis of the intersection of interactivity and communication design has identified the need for the following questions to be addressed in this thesis:

1. What does interactivity mean for designers within the everyday practice of web design?
  - How does the knowledge of communication design influence the emergent practice of web design with respect to interactivity?
  - Have communication designers developed new knowledge from their work in web design?
  - How do communication designers frame the user within the interactive environment of web design and how do they respond to this in their design practice?

2. Interactivity was a significant term in the 1990s. What is the relationship between what theorists said then and what designers now do?

## 1.4 | Summary of research methods

The research reported in this thesis was conducted by using a grounded theory approach, in which the possible answers to the above questions emerged from data as it was collected, and assisted in reshaping the questions. The specific research methods used were semi-structured interviews with web designers, which concluded with an active task in which the designers visualised interactivity in simple drawn diagrams, and an analysis of websites which the designers had either created or were inspired by. These methods provided three distinct datasets: the interview transcripts, the visualisations, and data on the qualities and features of the websites. Throughout the study, I built theories and tested them based on a comparison of data from each source. The research design enabled me to arrive at a deeper insight into the designers' perceptions than could be gained by using one method alone, and crucially, it enabled me to examine cumulative interpretations of what was said, what was visualised and what was implemented. Such an approach helped me to compare the designers' perceptions alongside their actions; and to gain a deep understanding of the research findings.

## 1.5 | Organisation of the thesis

To understand the complex relationship between communication designer's perceptions and practice of interactivity within the web context, this thesis discusses the conditions within communication design prior to the emergence of digital technology; the technological origins of interactivity, and the engineering and computer origins of the web; the emergence of the web into the mainstream as a result of the development and release of Mosaic, the first web browser; the turf wars between usability specialists and graphic designers; and the establishment of vocabularies used to describe interactivity and interactive environments to determine how these factors contribute to the current conditions in which design for the web is undertaken.

Chapter Two sets out a history of design, beginning with design as a trade practice in response to the Industrial Revolution. It examines the relationship between art design, the importance of commercialisation in differentiating art from design, the role of technology and the growing visual culture in society. This chapter demonstrates how technological change has influenced design practice throughout its history, and how design shapes the use and uptake of technology. It then considers the technological uptake by designers in the 1980s. The purpose of Chapter Two is to establish the

context in which design occurs and how historical practice has influenced designers' approaches to the web. Fundamentally, this chapter highlights how commercial art and graphic design were already components of communication design, even before it was called such. However, the change to this explicit label coincided with the emergence of the web, and designers' approaches to interactivity were influenced by the growing recognition that design is always about communication.

Chapter Three focusses on interactivity. It examines designers' responses to the web and their recognition of the changed conditions in which they design visual communication, especially because of the clear trend towards practicable interactivity. Designers, aware of the changes taking place, used their work to explore interactivity within the context of communication design. This chapter highlights that communication designers have made very little explicit contribution to the scholarly discussion of interactivity. To achieve a clearer understanding of what interactivity might be, Chapter Three examines it from the perspectives of HCI, communication theory and interaction design. This comparative review provides a more abstract understanding of the conceptual constructs of interactivity, which then establishes the foundations for the comparison of the empirically generated descriptions and meanings presented in the remainder of the thesis.

Chapter Four presents the methods used for data collection and analysis in this research. It also explains the reasoning for using a qualitative research design and grounded theory approach. I examine the use of semi-structured interviews and visual data collection to gain a deeper insight into ideas and perceptions. The designer population is described and the composition of the sample defended. The data collection process is explained with respect to the location of interviews, the use of audiotaping, the method of transcribing and developing data files, the collection and analysis of diagrams, and the development and application of the protocol tool. This chapter outlines the features of the templates used to organise interview data and the use of NVivo software to analyse the conversations. It also describes the hybrid analysis that took place using NVivo, InDesign and posters that could be scribbled upon, establishing the value of an iterative process that moves between digital and analogue formats to examine relationships between the interviews, diagrams and websites.

Chapters Five, Six and Seven present the findings from the research, using different data to investigate the main research questions. Chapter Five contains the interviews, which show how designers speak about interactivity. These conversations allowed me to highlight and summarise designers' perceptions of interactivity, both in general terms and in relation to the web. This chapter shows how the process of talking about interactivity provides insight into

designers' thinking and production processes. It explores how designers speak of the user, the purpose of web design, interactive functionality, the constraints on design, design conventions, and how they approach design for interactive space. Although the designers' perceptions are varied, the sense that design for the web is different to design for print is a common theme, requiring designers to be literate in new areas such as user cognition and behaviour, knowledge of interactivity, time, sequence and motion.

Chapter Six presents and analyses the designers' visualisations of interactivity, using the key themes which emerged from the interviews and were reported in Chapter Five. The visualisations provide a different perspective on interactivity, and highlight both similarities and differences to the data collected in the interviews. This chapter presents the designers' original diagrams as well as variations of the diagrams that highlight specific details for comparative purposes. It examines the symbolism of visualisations and also explores specific topics discussed in the interviews that were not evident in the diagrams. Chapters Five and Six report on the designers' perceptions and ideas of interactivity in web design that were then compared with the actual websites they designed to ascertain whether the designers' avowed intentions were realised in commercial web design.

Chapter Seven presents the analysis of the websites that designers had either designed or were inspired by. Building on the main themes emerging from the analysis of the interviews and diagrams in Chapters Five and Six, Chapter Seven shows the data generated from an analytical protocol used to examine the websites for evidence of the use of interactivity. This protocol tool was deliberately designed on the basis of the interviews and visualisations to enable a comparison between thoughts and actions by designers. Chapter Seven identifies the simultaneously broad and narrow scope of commercial web design, and examines the main aims of designers when practicing user-centred design – notably the designers' role in simplifying complexity and creating narratives.

Chapter Eight discusses specific findings from the previous three chapters with the aim of answering the research questions set out for this thesis. It considers what interactivity means for the practice of web design and the broad influence of communication design on design for the web. The relationship between theory and an emerging practice is examined, as is the relationship between technology and its implementation in contemporary web design. Chapter Eight particularly notes, based on the data, the increased significance of the user in the design process for the web. It explores the gap between what designers say and do, and its implication for future research with respect to design for the web.

## 1.6 | Conclusion

This study examines how communication designers working with the web conceptualise interactivity and operationalise their understandings of the term. The relationships between practice and theory that have been established in this study mark a significant development in the formation of an interactive literacy – where designers’ contributions to the web can be recognised and valued rather than misrepresented. Through engagement with nine Australian designers, this study gathers data within the space of their operations – a space where understanding and implementation of interactivity manifest. Through empirical and theoretical investigation, this thesis will describe the conceptual and production practices within the practice of web design.

# 2 | Understanding communication design

## 2.1 Introduction

Communication Design is the most recent title for the practice previously known as graphic design. It has a rich history as a creative and industry practice, evolving into a rigorous discipline with significant cultural, economic, ethical and social implications (Meggs & Purvis, 2006; Drucker & McVarish, 2009). Whether known as graphic or communication design, a common perception from those outside the field is that communication design is a simple trade. Designers seek to address its low status by promoting its economic impact and value (AGDA, 2011), but literature within the field suggests that communication design is yet to clearly articulate the nature of its practice beyond the design community (Heller, 2006; De Vries, 2010). Scholars attribute this to the way in which communication design is practised: designers communicate visually, relying on creative instinct and empathy to inform their design process and visual solutions (Cross, 2006; Forlizzi *et al.*, 2008).

This thesis focusses on what interactivity means within web design. Being a subsection of communication design, it is therefore necessary to explore what is meant by communication design and computer-mediated interactivity. This chapter explores the evolution of communication design practice from commercial art through to its current form, focussing on definitions of communication design practice, nomenclature, communication design's relationship to art and technology, and the emergence of a critical communication design theory. This chapter is structured in two parts. The first part focusses on the emergence of commercial art and its evolution into graphic design. The second part examines the change of nomenclature to communication design.

The practice of communication design is frequently described as being in a constant state of flux, influenced by the social, cultural, economic and technological factors of an era. Emerging in the Industrial Revolution, the trajectory of communication design has been closely aligned with technological advances in reproduction, print, computing and digital networks (Findeli, 2001). This chapter therefore examines how communication designers have responded to and understood new technologies in order to provide the context for considering the relationship between design and interactivity following the release of the first Macintosh computer in 1984.

This chapter explores the historical transition from commercial art to graphic design, and the emergence of communication design and multimedia design in a new media paradigm. It considers how communication design has been articulated and reviews the transfer of graphic and multimedia design skills to a web context. This chapter also describes the circumstances in which designers first approached interactive web design. To do this, it examines the research literature concerning design, specifically communication design, as well as reviewing the popular press, including industry forums, blogs and trade magazines, to establish how designers have contributed to the current shape of interactivity within the web domain.

## 2.2 | Mapping the practice of visual communication

This section provides an overview of communication design from its use in early tribal cultures to how it is currently practised. It examines how design relates to art, commercial activity, technology and today's highly visual culture. This section also describes the symbiotic relationship between design and technology in order to establish an understanding of how communication designers adapted their practice to adopt new technologies.

### 2.2.1 Historical context of communication design

The study of visual communication prior to industrialisation lies beyond the parameters of this study, but it situates visual communication as a key human activity shaped by contextual conditions (Rand, 1985). The long history of people communicating visually on topics ranging from food, water, shelter, spirituality and warfare is evidenced by Australian Aboriginal rock art dating back 40,000 years, cave paintings in Lascaux (15,000–10,000 BC), Sumerian pictographs (3100 BC), Egyptian artisans (5000 BC–300 AD), Chinese calligraphy (4000 BC) and communication systems such as smoke signals (Meggs & Purvis, 2006; Friedman, 2000; Hollis, 2001; Saffer, 2010). As mentioned previously, the ability to design and manufacture tools to implement change in our surrounds has been a main contributor in making us human and separating us from other species (Friedman, 2000; Heskett, 2002). A significant example of technology that has enriched our livelihoods irrevocably is Gutenberg's invention of movable type in the fifteenth century. The construction of this technology changed civilisation through the provision of information through print (SBS-TV, 2008).

Design as a profession emerged during the Industrial Revolution (1760–1840) as a way of making industrialised products acceptable from a social, economic, symbolic and practical perspective (Findeli, 2001; Heller, 2005; McCoy, 2005). Commercial art, the original appellation of communication design, combined fine art and technology to service the advertising and publishing sectors (Caban, 1983; McDermot, 2007;

Drucker & McVarish, 2009). It was perceived as both a creative and commercial practice, bringing art and industry together to stimulate a consumer culture (McCoy, 2005). The rise of reproduction technologies increased the distribution of media arts and spawned new types of employment around commercial art, shifting the practice from its artistic heritage to one whose purpose was communication and inherently commercial.

Advances in the profession of communication design have been linked to technological advances. Inventions such as photography,<sup>1</sup> letterpress,<sup>2</sup> lithographic printing,<sup>3</sup> chromolithography,<sup>4</sup> offset printing<sup>5</sup> (Meggs & Purvis, 2006) and most recently digital technology, were significant because they afforded new modes of communication and efficient means by which to achieve it. Updated production methods enabled more economical communication and have been the catalyst for broadening the scope of design and stimulating new forms of expression.

Drucker and McVarish (2009) comment that the adoption of technology in society is not automatic but rather mediated through its employment by designers. Through exploration and experimentation designers shape how technology is embraced in society. It is in this context that design historians discuss the cultural forces – technological, geographical, political, economic, social and academic – that have shaped communication design in a non-linear progression that is inconsistent amongst cultures (Drucker & McVarish, 2009; Gomez-Palacio & Vit, 2009; Jobling & Crowley, 1996).

Visual exploration and experimentation is an activity that design shares with visual art. The boundaries between the two areas are fluid and blurred, and they

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- 1 Louis Jacques Daguerre recorded the first photograph in 1839. Although there are earlier records of photographic experimentations, Daguerre perfected his process and presented it to the French Academy of Sciences, who admired the detail and reproduction quality of the daguerreotype prints.
  - 2 Letterpress printing was a process of relief printing first invented by Johannes Gutenberg in the mid-15th century. It involved the setting of movable type into a type-high bed, which was inked and then pressed onto a sheet of paper to obtain a print.
  - 3 Lithographic printing emerged in the 18th century. The process used limestone or metal plates treated with chemicals to create ink-receptive areas on the printing surface. Lithography had the capacity to reproduce fine details, which increased the variety of circulated media.
  - 4 Colour lithographic printing that used the same process as lithography and emerged in the late nineteenth century.
  - 5 Offset printing is a technique where the inked image is transferred from a plate to a rubber blanket. From there it is transferred to the printing surface. Similar to lithography, the image to be printed is inked by ink rollers, although non-printing areas are kept ink-free.

diverge at different times (Drucker & McVarish, 2009). However, communication design is a different proposition due to its commercial imperatives. Caban (1983) discusses the mutual respect between artists and designers in Australia, highlighting instances dating back to the gold rush era, when artists moved between commercial and non-commercial projects. Examples of this reciprocal influence between art and communication design can be found throughout the history of commercial art, but particularly in the nineteenth and twentieth centuries when commercial art was in its infancy. Artists working in typographic design or advertising can be found in the decorative arts period, approximately 1860–1900, and Art Nouveau period, approximately 1870–1913. The decorative arts period was typified by strong pattern work and fine detailed colour reproduction. William Morris, the leader of the English Arts and Crafts movement, stated that his objectives were to bring art and design together as an integrated whole. Similarly in Art Nouveau, artists such as Toulouse-Lautrec moved between art and advertising, and were instrumental in developing highly decorative advertising posters.

While there were obvious overlaps between the creative endeavours of art and commercial art, each field had different aims. Art has a rich tradition of reflexive scholarship, historical contextualisation and theorisation of practice as a result of its high cultural status, whereas commercial art has not had this same level of attention. Over time, as commercial art divided into graphic design and advertising, it became key to the development of consumer capitalism, explaining the field's exponential growth. As a result the differences between art and design were more accentuated, but nevertheless design still lacked the level of reflexive inquiry enjoyed by visual art because commercial artists provided a service and as such were perceived to lack the autonomy to 'determine the outcome of their work' (Forty, 1986).

The splintering of graphic design from commercial art between the 1920s and 1950s reflected the concern held by designers over the growing scope and increasing complexity of communication goals in a changing social environment. The term graphic design emerged in the 1920s in reference to design in the United States and at the Bauhaus in Germany. It identified a different set of objectives to commercial art and split the field into two streams linked to different communication aims: information provision and persuasion. Internationally, the distinction between commercial art and graphic design was not uniform. Many designers continued to practise in both domains throughout the twentieth century, with leading designers such as Paul Rand involved in both advertising and graphic design projects (Hollis, 1994; Rand 1985).

The rise of information and service economies in the 1980s, coupled with a shift in the prevailing ideologies of modernism to postmodernism, impacted on the role of communication (Puttnam, 2000) with a renewed emphasis on branding (Meggs & Purvis, 2006; Hollis, 2001). Although graphic design grew in ubiquity as a result, pervading all aspects of daily life in developed economies (Kalman, 2002), knowledge of graphic design remained embedded in the practice of doing. The launch in 1984 of the first Macintosh computer ignited tensions between graphic designers, polarising the design community into those who embraced the computer or approached it cautiously, and those who saw in it the destruction of the quality and commercial viability of graphic design because a desktop computer would enable anyone to be able to do design (Haig, 2002; Drucker & McVarish, 2009).

The digital revolution in graphic design also enabled designers to break from the constraints of modernism and traditional production methods. Designers could now control the whole graphic design process from initial concept to finished art. Clients could participate more in the design process, with outcomes developed through an increasingly fluid and collaborative process. Many graphic designers now approached design as aesthetic exploration, design software enabling them to readily work outside the modernist grid structures and to play with meaning. In the work of the most radical graphic designers in the 1980s and 1990s, visual complexity, manifold meanings and self-expression were common. When the web emerged, some graphic designers perceived the simplistic tabular structure, command-line and limited colour palette of early computer interfaces as a restrictive return to the regimented modernist grid structures rejected a decade earlier, while others recognised the communication and expressive potential of the web. For the latter group, the addition of space and time to graphic design practice was perceived as a natural progression.

### **2.2.2 Purpose, medium and form**

Communication design clearly mirrors the changes in society, its purpose being to communicate things happening in the present. The communication imperative means that visual design is subject to the influence of new communication and production technologies and changing formats. A review of the historical literature and popular press highlights how integral form and media are to refining communication objectives, which shape a design concept. As the range of media types grows, the type of communication broadens, which in turn impacts on the purpose and types of communication – for example, books, posters, signage and visual identity systems all have diverse communication objectives, which are also influenced by prevailing ideologies and objectives.

Modernist graphic design emerged in the early twentieth century in response to both the excesses of commercial design and the ornamental handcrafted style of the decorative arts. Modernism was not unique to graphic design, but rather an ideological and philosophical response to the new social, economic, political and industrial conditions in the early twentieth century. Underpinning the modernist ideology was the utopian vision of universality and rationalism, the celebration of the machine age and mass production. Modernist graphic designers sought an objective approach to design that was systematic and repeatable. They stripped away ornament and unnecessary details (McDermott, 2007; Gomez-Palacio & Vit, 2009; Davis, 2012). Although modernism originated in Europe within the Bauhaus, De Stijl, Futurism and Constructivism, modernist ideals migrated swiftly to America where they were integrated pragmatically into an advertising domain. A hallmark of the New York School was a modernist approach to asymmetric composition, white space<sup>6</sup>, typographic systems and mechanically produced images. Bauhaus graphic designers such as Herbert Bayer and László Moholy-Nagy sought to create a universal design language free from predetermined styles (Meggs & Purvis, 2006), and in so doing developed a philosophy of modernist graphic design that strove for clarity of form with universal function (Hollis, 2006). At the core of modernist design, exemplified by the International Typographical Style, which later became known as Swiss Style, was the objective design of information. Swiss style designers, such as Joseph Müller-Brookman, Armin Hofmann, Emil Ruder and Adrian Frutiger were concerned with the simplicity of pure communication that emerged through the successful integration of text and image reading as one entity.

The migration of European designers to the United States during and after World War II spread modernist ideals, but the new consumer context saw them active in corporate areas, reshaping modernism to fit with an American context. After World War II, progressive corporations internationally embraced modernist design as a reflection of good business practice. Other companies used more commercial and persuasive graphic design language to differentiate their product from competing consumer goods. Despite a greater commercial focus, the objectives of modernism remained the same: to be reflected in the simplicity of the industrial processes used to produce design artefacts. In this paradigm, the designer was anonymous and performed a mediation role between the client and the audience. While the communication objectives oscillated between informative and persuasive purposes, the objectives of modernism – form and content communicating as one utilitarian entity – remained the dominant paradigm until the 1970s (Rand, 1985).

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6 White space is a concept in design where blank space on a page is not considered passive, but rather contributes to the rhythm of the composition or overall system (Lupton & Phillips, 2008).

As a result, graphic design was characterised by minimal text and sophisticated compositions that demonstrated tension, dynamics and scale.

Although modernist ideals were communicated through the graphic form, a growing interest in the idea of postmodernism as a new period in cultural history and a specific set of cultural perspectives, practices and values, coupled with a changing economy, saw a rejection of the perceived rigidity of modernism. Postmodernism is a term that has been used to describe cultural developments in the late 20th century, specifically the 1970s onwards. The postmodern period was a time of change in the predominant social and economic environments (McDermott, 2007; Jencks, 2011; Davis, 2012). For example, Jean François Lyotard (1979) argued that the development of new communication technologies contributed to the death of modernity's metanarratives of truth, freedom and democracy, as well as the compartmentalisation of knowledge into information without connection to epistemic traditions. Combined with a more globalised view of the world and the exponential growth of mass media, decentralisation, as discussed by Lyotard, also occurred in social structures, challenging singular perspectives on the world.

Equally, the influence of continental post-structural theory on postmodernism highlighted that meanings and values were not inherent and transcendent, but rather relative to particular social groups and situations. There has been ongoing debate as to what postmodernism is, and how and why it initially emerged (Jencks, 2011). Some theorists say postmodernism was a reaction against the rationalistic and objective approach of modernism; others claim it was a continuation of the earlier modernist movement (McDermott, 2007). For communication designers, debates and ideas connected to postmodernism challenged the incumbent conventions associated with the modernist design values of truth to form, function and materials, empowering designers to challenge traditions pertaining to visual communication, composition, typography, image making and printing techniques (Davis, 2012).

Continental linguistic philosophy's deconstruction of signification in language was also a significant set of ideas for designers, along with the changed perspective it introduced in terms of the role of reader as one who was actively engages in interpreting the text, contesting the designers' role as the mediator of the messages incorporated into designed artefacts. Post-structuralism's interest in signifying systems across the breadth of culture challenged boundaries between high culture and the vernacular, encouraging communication designers to explore the roots of their practice in commercial art. From the late 1970s, designers influenced by the discourses and practices linked to postmodernism generated content and participated in design authorship, using signs and symbols to communicate any type of message, whether for a commercial, political or ideological agenda.

Inspired by the writings of Jacques Derrida and Roland Barthes in the 1960s and the post-structuralist projects of architect Robert Venturi, some sections of the design community, known as new wave designers, sought new modes of expression that celebrated complexity and multiple interpretations (Heller, 2004). Typified by deconstruction, appropriation, opposition, authorship and new technologies, postmodernism was the antithesis of modernism (Poynor, 2003). Where modernist designers performed an intermediary role between client and audience, postmodernist designers became visible as they engaged in content generation and design authorship. They challenged the status quo by questioning everything (Julier, 2000; Poynor, 2003; Gomez-Palacia & Vit, 2009): the designer's role, the audience's role, legibility, meaning, interpretation and the purpose of design, all of which had an impact on the graphic form.

Notorious for his rejection of modernist ideals, British designer Neville Brody focussed on the deconstruction of traditional forms and ways of reading. He constructed hybrid languages comprised of typographic characters and symbols that were simultaneously recognisable yet illegible. Similarly students in the United States at the Cranbrook Academy of Art were exploring the notion of interpretation in a postmodern aesthetic. Like Brody, Cranbrook staff and students pursued an approach to design that pushed against traditional boundaries established by modernist designers in order to engage the user in the act of interpretation and constructing meaning.

At the same time, VanderLans used *Emigre* magazine as a platform to question incumbent design ideologies. Established by a group of designers, they reflected on new approaches to design through essays, interviews and self-generated content. *Emigre* was perceived as a 'giddy exploration [of] wild aesthetics' (Gomez-Palacio & Vit, 2009, p.101) and was a vehicle for designers to respond to the shift in the design environment both visually and editorially. Subsequently, in 1990, the seminal *Eye* magazine was established, which also delved into contemporary graphic design. Common to both magazines were strong graphic forms that explored the designer's postmodern aesthetic.

Magazines exhibiting a postmodern aesthetic included *The Face* (1980–2004), designed by Neville Brody, and the surf grunge magazine *RayGun* (1992–1999), designed and produced by David Carson. Editorially, the content of *The Face* or *RayGun* was not design related, but the layout and visual language of these magazines epitomised the edgy and experimental design that was prevalent at this time. Brody's layout and customised typefaces were bold, dynamic and confronting. In *RayGun* no page bore any similarity to the other, and each article had its own style appropriate to the content.

The significance of *Emigre*, *The Face*, *Eye* and *RayGun*, along with their designers and those at the Cranbrook Academy of Art, cannot be underestimated, as they empowered other designers to question their role as mediator and move beyond incumbent ideologies. Their work was the catalyst for broadening the focus of design, which shifted from the modernist emphasis on integrated form and universal communication to a practice concerned with multiple meanings and self-expression. The magazines captured the imagination of young designers, and the convergence of postmodernism and the emergence of the Macintosh enabled designers and writers linked to *Emigre*, *The Face*, *Eye* and *RayGun* to develop an approach to design that was abrasive, dynamic and raw.

### 2.2.3 The digital revolution

The shift from analogue and electronic technology to digital technologies in the 1980s has been coined the 'digital revolution'. The emergence of the Macintosh in 1984 was significant on multiple levels: the graphical user interface (GUI) and the small 14-inch personal computer differed dramatically from standard command-line computers. Coupled with Adobe's PostScript page layout software, the Macintosh computer was ground-breaking in its onscreen representation and intuitive tools (Julier, 2000). For the graphic design community, the Macintosh changed the basis of graphic design practice by incorporating all aspects of design and production into one design process. Using the Macintosh, designers could exercise creative control over all facets of their design work: concept development, design, finished art, editing and typesetting.

Not all graphic designers embraced the new technology. Modernists such as Paul Rand objected to the personal computer, believing that it deskilled and devalued the graphic design process. However, the Macintosh accelerated the rise of a postmodern aesthetic in graphic design (Poynor & Booth-Clibborn, 1991). Young designers used the Macintosh as an adjunct to experimentation in type design, visual form and the layering of text and image. Through their practice, new wave designers questioned modernist graphic design's formulaic approaches to layout and visual form.

Typography underwent major changes in the 1980s. The Macintosh enabled designers to more readily design fonts, typeset copy, and adjust and alter text. This was vastly different to previous processes, in which designers directed the work of typesetters and finished artists who produced final press ready artwork. Tired of the uniformity and one-dimensionality of sans-serif fonts, designers such as Brody, Barnbrook, Kisman, Deck, Fella, McCoy and Makela designed experimental typefaces that held a symbolic function. For example, Barnbrook's typeface 'Burroughs' contained

associated and random behaviours: as the user typed, characters and words were replaced with gibberish. Brody's play with historical typefaces alluded to parallels between the authoritarian political climate of Europe in the 1930s and 1980s Britain (Poyner & Booth-Clibborn, 1991). Emigre Fonts, established in 1986, created numerous digital type families set for specific content in issues of *Emigre* magazine (Gomez-Palacio & Vit, 2009).

The introduction of the Macintosh supported self-publishing and designer authorship. The late 1980s saw an increase in the number of independent monographs and publications such as *Emigre*, where the designers were no longer the anonymous mediator between client and audience, but combined the roles of author, designer, editor and producer to communicate opinions or political agendas. Designers experimented with the quirks and integral characteristics of digital technology to play with meaning. While Drucker & McVarish (2009) suggest that advocacy has been present throughout the history of graphic design, the acceleration of production processes resulting from the Macintosh saw the exponential rise of design authorship in the 1980s and 1990s.

The shorter timelines and more transparent processes afforded by the Macintosh changed relationships between client and designer. Prior to the 1980s, there was little documentation of the stages of the design process, with designers seemingly arriving at a solution in a moment of brilliance. Clients were required to take a 'leap of faith' and trust the designer's intuition (Gleeson, 1996). The design process was mysterious and occurred without client intervention. With graphic designers taking control over more of the design project and with the growing accuracy of screen representation, clients could see and alter design elements on the spot, thereby having more opportunities to affect the final outcome.

The emergence of interactive software fuelled discussions about who was a designer and what was graphic design, especially with Apple's release of HyperCard, a program that enabled users to create basic multimedia content. This program changed the computer from a design tool to a design medium. HyperCard was the first of many software developments that would enable graphic designers to create stand-alone interactive programs for delivery on CD-ROMs through which users could navigate using hyperlinks not dissimilar to the web. Pioneers of multimedia design applied established principles of graphic design to these new interactive systems, constructing visual display and information systems, which required them to think about the audience in dynamic and responsive environments (Drucker & McVarish, 2009).

In summary, the Macintosh changed graphic design practice irreversibly. It supplanted established contexts for graphic design, introduced new ways of

working, increased the scope of design and supported the spread of postmodernist values. The Macintosh divided the graphic design community, with one section of the industry in particular seeing it as an assault on the specialised knowledge of the designer through its reduction to and repackaging as a computer program. While the launch of the Macintosh created some confusion outside design communities who thought design thinking could be accomplished with a computer, Drucker and McVarish (2009) suggest this misperception was short-lived. However, the legacy of the Macintosh and the democratic perception of design continues, as evidenced by the popular press, where designers justify the rigour of design and design thinking on an ongoing basis.

#### 2.2.4 Changing notions of good design

Throughout the history of communication design, there has been a recurrent debate about what constitutes good design. Usually these debates coincide with periods in which designers perceive the technical and commercial interests of design as prioritised over the graphic form. By establishing an understanding of what constitutes good design, designers have sought to define their expertise and tools in order to set standards of practice, differentiating their design process from one that is driven purely by commercial imperatives. The formation of art, technical and correspondence schools in the US and Europe in the late nineteenth and early twentieth centuries was an attempt to promote good design through a curriculum and standardisation of knowledge. Significantly, the introduction of training in commercial art saw the emergence of specialist fields, such as typesetter, illustrator, finished artist or layout artist. This alignment of art and industry artists marked a key difference between visual art and communication design, providing the basis for the future role of the professional graphic designer (Drucker & Varish, 2009; Gomez-Palacio & Vit, 2009; Hollis, 2001; Meggs & Purvis, 2006). Despite the growing specialisations, the emphasis on technology and the propensity for change made it difficult for designers to articulate a notion of good design that had longevity.

While design and technology are intertwined, tensions emerge when mass production methods and commercial imperatives take priority over the communicated form and designers perceive a loss of design integrity. There is evidence throughout the history of graphic design of periods in which designers prioritise their design and thinking over the commoditisation of design. Some examples are the Arts and Crafts movement, which sought a return to handicraft in response to the negative perception of mass production in the Victorian era (Meggs & Purvis, 2006); the Bauhaus, in 1919, whose manifesto argued for the uniting of art and technology in the total work of art (Whitford, 1984), as opposed to one determining the other; and Meggs's ground-breaking *History of Graphic Design*, which distinguished what was considered good design throughout history.

This chronicle of graphic design is written in the belief that if we understand the past, we will be better able to continue a culture legacy of beautiful form and effective communication. If we ignore this legacy, we run the risk of becoming buried in a mindless morass of commercialism whose mole-like vision ignores human values and needs as it burrows forward into darkness (Meggs, 1983).

At the heart of the tensions between design and technology is the notion of good design, and designers' universal inability to articulate a shared understanding of design. Despite this clash between design and the dictates of technology that continues to surface, communication design today represents a wide array of highly evolved design activity with a highly visible role in contemporary culture (Helfand, 2007; Heller & Womack in Lenander, 2008; Shedroff, 2012).

Unfortunately designers explain their practice as ubiquitous and ephemeral, evident in the world around us, with limitless capacity for growth due to the ever-expanding communication needs of society (Kalman, *et al.*, 1994; Heskett, 2002; Helfand, 2007; Ashton in Twemlow, 2006). This description gives the impression of designers' omnipotence, which is difficult to standardise and establish as a rigorous practice. Additionally it makes it difficult for non-designers to fully grasp. As a result, academics and design commentators tend to be less expansive in their definitions, concentrating on the aims of the activity and tools. Poggenphol (1993) defines graphic design as a 'creative process that combines art and technology'. Hollis (1994, p.7) describes it as 'the business of making or choosing marks and arranging them on a surface to convey an idea'. Livingston and Livingston (2003) explain it as an activity that combines typography, illustration, photography and printing for the purpose of persuasion, information or instruction. These reflect Dwiggin's 1922 description of the graphic designer as 'an individual who brought structured order and visual form to printed communications' (Meggs & Purvis, 2006), but do not reflect on the validity of good design within the definition.

The change from modernism to postmodernism paradigms has seen a shift in what is considered good design. While the modernist ideal was to develop designs that communicated one clear message, postmodern objectives sought to engage the audience in an act of interpretation where a communication had the potential for multiple meanings (Poynor & Booth-Clibborn, 1991; McCoy, 1995). Notably, graphic design artefacts created after the introduction of the Macintosh reflect a revolutionised scope and purpose, suggesting that good design is not about technology but rather how it operates and is understood in a social context. However, with the introduction of interactivity in a digital domain, the notion of good design requires revision to accommodate the audience's changing role, graphic elements in digital space, and interactive behaviours. This change challenges existing ideas of good design and questions whether graphic design can be reduced to a single definition.

Both graphic design and multimedia design shared a communication goal, but in the digital environment, both approached the space with different understandings and methods of achieving good design for the web. The interactive space enables designers to communicate using more than graphic elements of text and image. With the emergence of the web, multimedia designers started to migrate to the new medium as its extensive networks enabled wider communication potential. They began to develop the web so that it might be a vehicle to deliver time-based media, rather than the resource for information exchange initially intended by Berners-Lee (Haig, 2002). They were, however, hampered for a time by low bandwidths (Siegel, 1996; Nielson & Loranger, 2006). Conversely, graphic designers approached the web almost as if it were a book or magazine, using careful layout of type and image to structure readers' experiences. As a result, two different approaches to the web developed: one was a replication of a stand-alone CD-ROM experience and then the other was a version of print.

Designers often define their practice based on the artefacts, which does little to communicate design beyond the graphic form. As discussed, the rigour of the design process is often overlooked, with communication design perceived as little more than *eye-candy* (Blevins *et al.*, 2006). In an attempt to explain the increasing complexity of design, a number of influential texts emerged to trace the history, scope and increasing sophistication of communication objectives in graphic design. Critical writing in the 1990s saw designers, design commentators, historians and academic researchers begin to contextualise design in journals such as *Design Issues* (1984–) and *Design Studies* (1980–), and anthologies such as *Looking Closer* (1994–2006). In doing so, they sought to situate contemporary design and provoke cultural and intellectual inquiry into design issues, including communication design. Of these publications, *Looking Closer* focussed specifically on graphic design and included essays from earlier editions of *Emigre*, together with papers and speeches. Although it attempted to establish a critical graphic design theory, it ceased in 2006, with editor, Steven Heller (2006), citing the emergence of blogs and less formal writing methods as a preferred method of debate in communication design. What is significant about these texts is the contextualisation of contemporary practice.

What is evident in the current literature, both in the blogosphere and popular press, is that designers are still yet to consolidate a notion of good design for the web. While some aspects of good design in the print domain are relevant, there is still a need to reconcile the way designers employ interactive behaviours, information systems, interactive space and responsiveness. Incorporating these additional aspects will enable web designers to establish standards around what constitutes best practice for the web, regardless of technological determinism.

### 2.2.5 Shifting practice: graphic design in the 1990s

The emergence of digital technologies and communication networks in the 1980s and 1990s occurred alongside changes occurring in the economy. The combination of digital technologies and a shift to a service-based economy had a significant impact on the aims and scope of graphic design. In this context, the adequacy and relevance of the term graphic design was questioned, including whether it represented visual communication in a digital environment. Although the graphic qualities of the early web were limited, designers were acutely aware of impending change to the communication landscape. The variety of communication modalities introduced by the web, discussions of paperless offices and the accelerating uptake of interactive media challenged the established parameters of graphic design.

Like the desktop publishing revolution in the 1980s, many designers saw the emergence of the web as a threat to what constituted good design. The key tensions between design and technology emerged, including tensions between digital art and design, and between graphic design and multimedia design. Tensions also arose surrounding the diverse definitions of utility, usability and control, all of which were underpinned by interactivity. Although graphic designers needed to design for the new context of the web, the design literature revealed a critical lack of knowledge about this new context, as existing specialised print knowledge was not entirely relevant. (Crawford, 2005; Drucker & McVarish, 2009).

The convergence of fields working with the web introduced a lack of coherence around the nature and purpose of graphic design. Non-designers criticised a graphic design approach to the web, depicting graphic designers as lacking the necessary knowledge, imagination, skills and approaches to design successful interactive environments (Helfand, 2001; Crawford, 2005; Naughton in Montgomery, 2012). New types of design activities emerged, with graphic designers working in the context of the web creating controlled experiences through which users navigated. Graphic designers were working with interactivity, but the design literature gives no indication that they understood the full implications of the term, or its impact on graphic design practice. Design for the early web contrasted with the expressive and communicative freedom within a postmodern period. Interface design was highly structured. Online displays favoured functional utilitarian sans-serif fonts, coupled with tabular cell structures. Designers resumed the role of mediating the message. Simultaneously, the environment of the web demanded that graphic designers see design as an act of communication, suggesting the need for change in the very term of graphic design.

### 2.2.6 Conclusion

This brief historical overview has highlighted the interrelationship between design and social and technological change, and how this relationship has led to increasing complexity in the practice of graphic design. The discussion has shown that, although graphic design's alignment with technology has differentiated it from visual art, it is often still considered artistic, and this perception has downplayed its important economic role and contribution to contemporary culture (Roos, 2012). A question that emerges is how graphic designers have transitioned successfully into a digital domain, and the implications of this shift. The ambiguity and complexity of graphic design, and how it changes yet stays the same, is fascinating. Graphic design has shifted from fixed print formats dealing predominantly with image and text to fluid digital formats. Technological means have changed, but many of the challenges remain the same. Reviewing the literature of graphic design reveals that graphic designers have been challenged by the emergence of networked technologies, forcing them to think beyond their specialised knowledge and to consider more deeply the needs of the audience in new communication formats.

## 2.3 | Communication design

The term communication design surfaced in the 1990s during a time of flux. The Macintosh had already changed how graphic design was practised and designers ideas of what constituted good design. The Macintosh, initially perceived as a tool for the implementation of two-dimensional design, was soon shown to be a platform to distribute communication, introducing new considerations such as time, choice, sequence, behaviours and response within an interactive environment. As discussed, some designers embraced the new media, but others remained sceptical and did not move beyond the print domain. The rise of the web further challenged the idea of graphic design, leading to a shift of nomenclature to communication design.

Prior to this, however, the new practice of multimedia design had emerged. This term described designers who worked primarily with digital communications, developing interactive CD-ROMs and interface designs for interactive kiosks. This division of graphic design into designers working with print or screen is arguably the reason that the title communication design remained a conceptual construct rather than something alive in the minds of designers. Some professional organisations advocated a change to communication design on the basis that graphic design had been 'technologically undermined' (ICOGRADA, 2000), but it was a number of years before any renaming occurred. The second part of this literature review focusses on communication design: its meanings, how

designers and non-designers have understood the term and related issues; the interrelationship between technology and practice, and considerations of changing perceptions of the user as a result of a new focus on interactivity. This section provides a basis for considering the context in which communication designers approached the web, and reviews their initial perceptions of that context.

### 2.3.1 What is communication design?

The International Council of Communication Design Association (ICOGRADA)<sup>7</sup> describes communication design as ‘an intellectual, technical and creative activity, concerned not simply with the production of images but with analysis, organisation and methods of presentation of visual solutions to communication problems’ (ICOGRADA, 2008). Outside university descriptions of communication design programs, there are few definitions of communication design, even though the title has been in existence for over ten years in an academic context. The term has only recently gained recognition within the design community as more than a re-badging of graphic design and is now acknowledged as a field that encompasses graphic design, multimedia design and digital media design, as well as other disciplines that share the communication imperative (ICOGRADA, 2011; Design Management Institute (DMI), 2011; Design Institute of Australia (DIA), 2011; American Institute of Graphic Art (AIGA), 2012). Seeing communication design as merely a new name for graphic design has perpetuated various myths linked to graphic design, misrepresenting, in particular, its scope of practice. The ICOGRADA definition is intentionally general to avoid the association of communication design with specific technologies (multimedia), stylistic approaches (graphic) and contexts (commercial), these all being subject to change. This approach aims to establish communication design as a broad field that covers specialist design genres which share a communication imperative. These include brand identity design, design management, graphic design, information design, motion design, package design and web design (DMI, 2011), and forms the basis for increasing acceptance of the term communication design by professional organisations and the communication design community.

The implications of new technologies for graphic design have resulted in the growing acknowledgement and adoption of communication design as an apt description. In light of these changes, under a communication design umbrella, graphic design has become associated with a specific type of practice that has

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7 While the acronym remains the same, ICOGRADA ratified a change in title from International Council of Graphic Design Association to the International Council of Communication Design Association in 2011. This is similar to American Institute of Graphic Artists (AIGA), which is now known as the American Institute of Communication Designers, but maintains the acronym AIGA.

tangible outcomes, while multimedia design matured into digital design also a field that falls within Communication Design, which includes design, for the web and mobile devices. The adoption of communication design as a term is inconsistent globally. This can be attributed to cultural factors and the way the term emerged initially when the full impact of the web on graphic design had not been realised. Graphic designers' responses to the web also followed a historical pattern of layering new technology over old paradigms of practice (Drucker & McVarish, 2009). As a term, communication design is broad, encompassing the overarching communication imperative of those disciplines that sit within its spectrum. The ICOGRADA definition also stresses the rigor and intellect associated with communication design.

### 2.3.2 Problems with name changes

Commercial art, advertising, graphic art, graphic design and an emerging multimedia design were all professional practices of the 1990s that shaped an understanding of the new term communication design and its pluralistic domains (Harland, 2007). Whereas commercial art, advertising, graphic art, graphic design and multimedia design were specific and reflected a close association with technology, style or outcome, communication design reflected the overall objectives and eluded to the scope of design practice in this field. The term also provided a solution to the problem of the marginalisation of graphic design as a result of the emergence of multimedia design.

Since the birth of commercial art, the names given to practice in the field have focussed on technology (multimedia design), the intention of the artefact (commercial art and advertising) or style (graphic design and illustration). No name has been universally embraced or applied with clarity. Internationally, up until the 1970s, there were designers working as commercial artists while calling themselves graphic designers. To those outside the field, there was little appreciation that commercial art was different to graphic design, and many graphic design practices worked on advertising design until the 1990s.

The timeline in Appendix 2 shows the evolution of name changes from commercial art to communication design. It shows these in conjunction with various styles and ideologies. Emerging primarily to define the essence of the profession, the changes in titles have not served to clarify the profession for those outside the field. The differences between commercial art, graphic design, advertising and communication design are subtle, and the overlaps between each area create confusion and do little to dispel the myth that their main function is surface decoration (Blevis *et al.*, 2006; Forlizzi *et al.*, 2008).

Throughout the history of graphic design, technology has initiated new areas of practice and new forms of expression. Lithographic printing, photography, offset printing and computers have each broadened the media of design practice and the modes and scope of distribution. New technology has been instrumental in establishing new areas of specialised practice. For example, the invention of lithographic printing enabled printing in fine detail, which led to the specialisms of typographer, illustrator and layout artist (Drucker & McVarish, 2009; Gomez-Palacio & Vit, 2009; Jobling & Crowley, 1996). More recently, the computer and the web led to the development of multimedia design, web design and digital design. These new practices perpetuated many of the concerns and practices of graphic design, but in a new technological context that introduced new design considerations and practices.

The shift to communication design was intended to encompass all disciplines that shared the communication imperative. This renaming was in part a response to new technologies. Despite this, there is very little discussion about interactivity as a key component in new media on the part of communication designers. This raises the question as to whether communication designers have considered what interactivity means in the context of design for the web. Communication designers have used the term interactivity and operationalised the concept in designing for the web. However, it is arguable whether they understood what it meant from a philosophical perspective. Communication designers' approach to designed communications on the web, in which they prioritised the aesthetic experience – text and image – over functionality, was significantly different to those working in the field of HCI, where usability and function was prioritised (Nielson, 1999; Haig, 2002). After two decades of designing communications for the web, it is still not clear what designers think about interactivity and communication in this context. Although it is a part of daily practise for many communication designers, they do not write about or research its practice.

### **2.3.3 Establishing a critical theory of communication design**

Much of the current debate frames design thinking as an activity central to innovation in virtually any field (Roam, 2009; Bason, 2010). Designers perceive design thinking and design practice as inextricably linked (Lawson, 2006; Melles, 2010; Hughes, 2010). Representing design practice as tacit knowledge, Murcutt comments that 'your hand arrives at solutions before your mind has even understood them' (Turner, 2011). Both industry and academic writing on design depict designers as nimble thinkers who can quickly change perspectives when needed in order to observe a problem from many different angles (Rand, 1985; Lawson, 2006; Cross, 2006). Designers are seen as creative thinkers who generate ideas visually

through an iterative process (Hanington, 2003). The literature of design perceives design thinking as innate, but also as a skill that can be learnt and improved upon through practise. For communication designers, design thinking manifests itself in visual form, that is, making marks on paper or a computer screen.

Communicating through the graphic form using visual language is the most complex and consequently least understood aspect of communication design. In the 1980s, early efforts to explain graphic design focussed on its ubiquity and the identification of best practice in a consumer society. (Rand, 1985; Hightower, 1989; Hollis, 1994; Kalman, *et al.*, 1994; Meggs & Purvis, 2006; Helfand, 2007). Several texts from the period, notably Phillip Meggs's *The History of Graphic Design* and Edward Booth-Clibborn's *The Language of Graphics*, document the history of graphic design artefacts as visual narratives that review the genres, communication objectives and technologies of graphic design at different times in history. Their accompanying texts discuss the cultural context for graphic design over time and how these influence communication objectives.

Throughout the 1990s, magazines such as *Emigre*, *Eye* and *Print* explored current challenges through editorial and content design, creating interpretive texts. Self-published monographs during the 1990s also reveal how individual designers, and the field in general, understood the nature and purpose of communication design. Rick Poyner's *Typography Now: The Next Wave* exemplifies texts of this period in which the typographic design encouraged two readings: a meta-level and a sublevel, reflecting the flux inspired by postmodernist ideologies. Monographs such as *The Visual Language of Neville Brody* revealed communication designers' individualistic approach to design and their commitment to finding new modes of expression.

More recently, communication designers, particularly those in Australia, have been criticised for 'looking at pictures' as opposed to reading (Clark, 2005), although this preference highlights their capacity to find meaning in the visual form. Literature suggests that communication designers have resisted making the design process more accessible to those outside design. For example, Cross (2006) and Lawson (2006) argue that designers are intuitive in their thinking processes and that their ability to think visually and communicate ideas through the graphic form is an innate capacity. As such, communication designers default to familiar practise, using visuals to communicate. In an attempt to demystify the design process, scholars argue that design is not 'magic', but systematic, repeatable and intuitive (Cross, 2006; Lawson, 2006; Crilly *et al.*, 2006). The only magical aspect about the process is the designer's experience, intuition and empathy and how this influences the resolution of communication problems (Cross, 2006; Lawson, 2007).

De Vries (2010) insists that designers be more active in explaining the nature and purpose of design, however the implications of Clark's earlier text suggest that their visual proficiency is a barrier for designers contributing to a critical theory.

### **2.3.4 Communication design, new technologies and interactivity**

The emergence of the web in the 1990s was a significant development for the communication design field, introducing a new media format. Some designers celebrated its networked modality, some approached it cautiously, and others kept away. Design in the context of the web challenged the communication design community. In contrast to design for print, there were more and new factors to consider, including size restrictions, new software knowledge, coding languages, colour systems, unit measures, time and sound. Generally, communication designers designing for the web felt a loss of control in the face of the technological characteristics of the medium, as well as the variety of monitors and browser interfaces affecting the way in which the final product was viewed. The web was conceived as a seamless, non-hierarchical world (Berners-Lee, 1992; Stromer-Galley, 2004), but these very features challenged communication designers, who had to diverge from the context-specific way in which communication design had traditionally been conceived and planned for print.

When the web emerged, communication designers initially responded using their knowledge of design for print. Lacking the new technological skills required, many struggled to adapt their expertise and thinking to the new electronic medium. This approach led to a narrow perception of design for the web that focussed on a graphical look and overlooked functional aspects such as interactivity (Engholm, 2002; Heeter, 2000). Multimedia designers, already familiar with digital technologies, were more technically equipped to transfer their knowledge of interactivity to the web, but they encountered different frustrations attributable to low bandwidth, download speeds and the then comparatively small numbers of people who used the internet.

Early web design was characterised by wall-to-wall text (Engholm, 2002), pre-formatted colour palettes, limited typefaces and a lack of information hierarchies apart from those embedded in early hypertext mark-up language (HTML). The release of the first browser using a GUI, Mosaic, was pivotal in allowing communication designers to present material more in the form of communication design – that is, with attention to legibility, communication and aesthetic, and affective styling. Even so, communication designers' approach to the web was patchy, some designers responding with utopian ideals and others with total pessimism (Julier, 2000; Poynor, 2003). Postmodernism and new communications technologies provided significant scope

for communication designers to operate as authors, rather than as intermediaries for clients. Design for the web, with its reliance on code and table-and-cell structures, appeared to hamper the creative process (Kotamraju, 2001). It suggested a return to a rigid, modernist approach to design (Engholm, 2002) that was opposed to the exuberant design of the 1980s. Initial perceptions of the web were that it was a version of print. Communication designers transferred their specialised knowledge and aesthetic principles to design for the web. Although it now appears naïve, web design in the 1990s was perceived by some designers as restrictive and thus limited in its capacity to communicate visually (Engholm, 2002). Over time this perception has changed, especially as the capabilities of the web have increased and designers have been able to recognise the scope for creative latitude and realise that good design for the web requires more than an aesthetic response (Buchanan, 2000).

The notion of good design was to create websites that, from a designer's perspective, communicated with clarity. Such clarity demanded control of the environment, as was previously the case in conventional graphic design. Designers such as David Siegel were concerned with the total user experience and the use of graphics to achieve this (Siegel, 1996; Engholm, 2002). This position contrasted with the computer science approach to effective website development, which prioritised functionality over form (Nielson, 2000; Carroll, 2002; Haig, 2002). Usability expert and functionality advocate, Jakob Nielsen, promoted hyper-functionalism by praising simplicity and rejecting aesthetic finesse. During the 1990s, Siegel and Nielsen represented the two extreme views of web design, and the intense debate over good design for the web oscillated between these two positions rather than acknowledging the critical role of each element in web design. In hindsight, the two camps were working, more or less, towards the same goals, but from radically different perspectives. Today, the web has matured, and it is evident that both usability and aesthetics are vital components in engaging web design. Designers understand that effective web design that engages and empowers the user requires consideration of the overall experience, which includes many elements, such as aesthetics, information hierarchy, language and tone, in addition to an understanding of interactive behaviours, usability, user expectations, as well as an understanding of digital space and how a user navigates and comprehends a website (Drucker & McVarish, 2009; Bonds, 2011; Sankarayya, 2011).

To date, however, the literature of web design lacks input from communication designers, who have not documented the diverse and significant changes to communication design brought about by the web. A reason for this could be that they are still in the process of understanding the web and contextualising their role with regard to the web. The early discussion of the web in design forums,

magazines and blogs focussed on technical issues (Siegel, 1996). Online forums such as *Design Observer*, *Voice*, *Speak Up*, *Australia In Front*, *A List Apart* and *Core 77* discuss issues concerning industry practice and the general activity of web design, but not theoretical concepts such as interactivity. Academic design research journals such as *Design Issues* and *Design Studies* discuss the impact of the web on communication design by reporting highly specialised areas of investigation – for example, the education of web designers, user responses to interactivity. What this suggests is that the contribution of communication designers to the web is practical and any communication design discussion surrounding design for the web is conversational and currently lacks theoretical underpinnings (Heller, 2006).

### 2.3.5 Digital technologies: changing the reader into a user

Before the invention of the web, designers developed visual solutions for people, an audience, a target market, demographics and spectators (Rand, 1985; Jobling & Crowley, 1996). These varied terms represented much the same thing: communication design was disseminated from one to many, with the many being the receiver of information. In this model, intuitive design, empathy and the notion of genius design flourished, with communications designers situating themselves as representatives of the audience, pre-empting their interests, needs and preferences (Rand, 1985; Meggs & Purvis, 2006; Forlizzi & Lebbon, 2002; Bennett, 2002). Even when designers considered their audience, there were no traditional methods used to understand the user, other than experience, observation, tacit understanding and a ‘designerly way of knowing’ (Cross, 2006).

Since the 1990s there has been growing discussion of the user, their varied needs, expectations and perceived sophistication (Forlizzi & Lebbon, 2002; Barnum, 2010). Despite the complexity of communicating to an increasingly diverse user group, the literature of communication design suggests that the old paradigm of intuition persists, explaining the emergence of texts explicating intuitive designer and empathetic practice (Cross, 2006; Lawson, 2006). The influence of design models adopted from HCI, such as user-centred design,<sup>8</sup> participatory design<sup>9</sup> and service design,<sup>10</sup> were co-opted in some sections of the design community,

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8 User-centred design is an approach to design originating in HCI and interaction design fields. The method involves inserting the user into the design process at various stages to better understand their needs, behaviours and response. A user-centred process evaluates design iteratively throughout the design process.

9 Participatory design attempts to engage all stakeholders in the design process to ensure the final design meets the requirements of the stakeholders and is functional and usable.

10 Service design involves the planning and organising of people, communication, infrastructure and materials of a service for the purpose of improved interactions between provider and customer.

but wider application of these methods has been limited due to time and budget constraints in commercial web design. While there is an increasing body of text that refers to the use of empirical methods in the aim of achieving a deep understanding of end-users (Forlizzi & Lebbon, 2002), such methods are applied unevenly across communication design practice. Moreover, it has been argued that empirical research does not replace intuition in design decision-making so much as it contributes to developing empathy for the end-user. What the communication design literature means by intuition is difficult to qualify.

Prior to postmodernism, the audience was perceived as a receiver of designed communications. In the 1980s, Roland Barthes's earlier text *The Death of the Author* (1967), inspired communication designers with the idea that audience members were active and creative interpreters of the meanings in images and texts (Lupton, 2006). In the 1990s a continued focus on the audience as an active user, as framed by HCI, coincided with the design of more interpretive texts, effectively shifting the audience from their role as a spectator to one in which they were involved in creating meaning (McCoy, 1995; Lupton, 2006). Modernists strove to deliver communications that were functional, unambiguous and universally understood. They saw design as a process that optimised readability and communication (Tyler, 1992). Paul Rand (1985), for example, suggested that design challenges were 'twofold': anticipating the user's response and satisfying the designers' aesthetic requirements. It could be argued, however, that the latter took precedence, designers being the arbiters of audience need and experience by effectively designing to satisfy themselves. In contrast, postmodernists focussed on activating the interpretive power of the user through design built around multiple narratives beyond the primary communication, accepting that audience reception could vary widely in response to communication context and audience experience (Tyler, 1992; McCoy, 2002). The shift from modernism to postmodernism changed the characterisation of the audience from passive to active. The design audience were now imagined as technically savvy and culturally sophisticated enough to navigate through a visually saturated world. The literature that follows the advent of the web from an HCI and communication theory perspective reveals a change in the way the user is considered. In design there is little to indicate whether a changed understanding of the user was reflected in design activities.

The literature found in communication design industry publications does not discuss the holistic needs and preferences of end-users in isolation, when considered in relation to the overall project and the objective of good design. However, designer, Frank Chimero has commented that 'people ignore design that ignores people' (2011). Suggesting a version of user-centredness, Milton Glaser claims the purpose of design is to 'move people to action or

to inform them' (Twemlow, 2006). Deborah Adler comments that successful communication design 'makes it easier for people to understand information' (Adler in Twemlow, 2006). Michael Beirut writes, 'surround it with as much theory as you like but graphic design is made by people and for the people' (Beirut, 2002, p.181). These comments indicate the importance communication designers place on audience members without significantly changing the one-to-many dissemination model. Despite the many attempts to legitimise intuition and empathy as a way of knowing (Cross, 2006; Lawson, 2006), criticism from other fields such as HCI shows communication design's allegiance to an intuitive approach to be a barrier to collaboration between the fields and the advancement of practice models.

Research in the areas of user-centred design, participatory design, interaction design and service design has made the user, and more generally human behaviour, an area of interest. Forlizzi and Lebbon (2002) observe that designers need to 'devise methods for creating empathy with the user', since relying on intuition is no longer enough. Hanington (2003) argues that because design is inherent to human need, it is critical to undertake research in order to design responsibly. He argues that design borrows and adapts traditional methods from other disciplines concerned with human behaviour; with time, designers and design researchers will establish a set of research methods specific to design. Significantly within the literature, user-centred design appears to be more frequently employed in some areas of design – for example, interaction, industrial and web design – than others. Oudshoorn *et al.*, (2004) observes that user-centred design has not been integrated into design practice due to the commercial constraints of time, budget constraints and the reliance of designers on intuition.

### 2.3.6 Conclusion

The review of the literature reveals that the term communication design emerged in response to new technologies and changing media formats. When new media emerged, communication designers acknowledged impending change without understanding the full implications for communication design. The new field of multimedia design relieved the majority of communications designers from thinking about the effects of technological change on their practice. When the web emerged it was multimedia designers who were perceived as technically equipped to design for it, given their experience with interactivity. Today, communication designers understand the web and their role within it, which assists in establishing a shared understanding of communication design that incorporates many design areas that share a communication imperative. Uptake of the term communication design has been slow. Significantly for this research, interactivity sits at the heart of much of the change in communication design since the 1980s. However, communication designers do not speak of interactivity as the catalyst for change. The term communication design is rarely used in general

discussions of design, making this thesis important in clarifying what the term means for practising communication designers, how they approach it in their design and how they have contributed to its current meaning.

## 2.4 | Conclusion

This brief history of the rise of the term communication design shows that the term is captive to its cultural and technological context. Although design has creative parallels with visual art, the fact that designers often work in multi-discipline teams places pressure on the communication design community to explain the nature and purpose of its practice. Unfortunately, the literature of communication design shows that this has been difficult for the field. Without clear, evidence-based explanations of the function and priorities of communication design practice, the field will continue to be marginalised, especially in the face of ongoing contextual and technological change.

The term communication design has done little to define the activity to an external audience or to delineate where communication design stops and other fields begin. In many instances, where the name has changed, the attitudes and practices of communication designers has stayed the same. To a degree, the flux around design has obscured what designers do. Communication design literature infers that the web has changed the nature and scope of communication design, making it a more complex proposition that considers space, human behaviour, cognition, design and aesthetics across multiple dimensions. However, aesthetic expression and intuitive interpretation of the client brief and audience remains the preferred practice in most cases. Drucker and McVarish (2009) argue that the true extent of change in a cultural field like communication design can only be measured retrospectively. The examination of interactivity in the subsequent chapters of this thesis seeks to reveal how designers have adapted to technological change.

Existing histories of communication design, communication design practice manuals, monographs on communication designers, and the collective works of communication design highlight that concepts of web design reflect on, rather than shift, time-honoured ways of conceiving the graphic object. This discussion of web design neglects theoretical accounts of both the web and interactivity from other disciplines. Definitions of good design in a digital environment are equally untheorised. The inability of designers to frame theory in the face of rapid technological change suggests a field that lacks reflexive thinking, and highlights the critical need for this present study.

# 3 | Defining interactivity

## 3.1 Introduction

Understanding and defining interactivity is a problematic task that has increased in complexity over the past two decades with the growth of new media landscapes. While the concept of interactivity is older than that of the digital revolution in the 1980s,<sup>1</sup> it became synonymous with new media and was recognised as the critical component that made new media ‘new’ (McMillan, 2006; Saffer, 2010; Polaine, 2010). Chris Crawford (2005) observes that in the heady days of new media, interactivity was a buzzword associated with anything technological that was new. The hype often confused the actual meaning of the term and set a precedent for defining interactivity within each new context, which further muddled the issue.

To be able to understand how communication designers understand interactivity, it is necessary to examine a cross-section of the literature to ascertain how the term has emerged, how it is understood, and to what extent practice shapes conceptual constructs. This chapter focusses specifically on three fields in which interactivity has played a major role: HCI, communication theory and interaction design. This section of the literature review will attempt to identify any commonalities between the three fields and examine the differences between the perception of interactivity. It also identifies any scholarly contributions from the communication design field in order to establish the extent to which they have contributed to shaping a definition of interactivity.

Prior to the 1980s, research into interactivity had been conducted in the fields, such as computer systems, software engineering, computer graphics and human factors (Carroll, 2002), that became the founding components of HCI. As such, practical concepts of interactivity underpinned research into virtual reality, the mouse, hypertext, windows, direct manipulation, GUIs, augmented reality, gesture recognition and text editing, amongst others (Myers, 1998; Rauterberg, 2002). The general assumption was that interactivity performed multiple roles, yet in the context of emerging technologies, interactivity and new media became synonymous

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1 The notion of interactivity can be traced back to Vannevar Bush’s (1945) essay in *The Atlantic Monthly*, ‘As We May Think’. In this essay Bush describes the hypothetical Memex that allowed the user to search for information via trails that operated in much the same way as hypertext links on the web.

and it was difficult to differentiate between them (Hanssen *et al.*, 1996; Heeter, 1989, 2000; McMillan, 2006). With the emergence of the web, defining interactivity became even more complex as it moved beyond a singular human-to-computer model to a networked paradigm that allowed for human-to-human interaction via computer, and even computer-to-computer, all layered together.

The lexical meaning of interactivity is derived from the noun interaction and the adjective 'interactive' meaning 'mutually or reciprocally active' or 'involving the actions or inputs of a user ... or being a two-way electronic communication system ... that involves a user's orders or responses' (Meriam-Webster Online Dictionary, 2009). Scholars argue this definition fails to communicate the depth and complexity that has come to be associated with interactivity, therefore, standard practice in scholarly literature is to state the difficulty of defining interactivity and the lack of a coherent definition, followed by an attempt to particularise the term within a specific context. More than a decade on, since the first definitions, the literature suggests that scholars appear to be no closer to a shared understanding of the term (Downes & McMillan, 2000; Bucy, 2004; Stromer-Galley, 2004). That said, there is increased familiarity with the term within the context of the web (Nielson & Loranger, 2006), and while we appear to be no closer to an overall theory of interactivity, there has been less emphasis on the new in the 2000s and more discussion regarding the type of experience interactivity facilitates.

## 3.2 | Design and the web

This section will lay out in detail the nexus between communication design and the web, exploring current literature, scholarly and popular, to provide the background for this study. It will investigate the emergence of the web and design's uptake of the new medium, with particular attention to issues associated with preconceptions of the web, designers' response to the web and the transfer of communication and multimedia design skills into the new environment created by the web. It will explore commercial web design practice and interactivity as well as review what research has been conducted in web design.

Since the emergence of the web, there have been rapid and dramatic changes in the media landscape. Drucker and McVarish (2009) suggest that throughout history, designers have adopted and shaped the uses of technology in a process where new technologies overlay old paradigms. Their writing suggests that designers absorb technological changes into practice, the results of which are evident in their design outcomes. It is almost two decades since the web emerged and it is

now a mainstream aspect of contemporary culture, though it is still unclear how communication designers approach web design, both aesthetically and functionally. As discussed in Chapter Two, the literature reveals that designers speak of their own approach to design as though it reflects all design practice. The aim of this section is to discover whether there are common ideals that designers consider when resolving communication problems for the web, or shared understanding as to what constitutes interactivity and the facilitation of an interactive experience.

### 3.2.1 Interactive technologies and the web

The web emerged in mainstream culture in the mid-1990s amid changes in the economic climate and media landscape, and shifting priorities in design that reflected the prevailing cultural changes. In the previous decade, tensions between design ideologies and technology had played out, influencing the purpose and function of communication in a burgeoning service industry. In the 1980s, interactivity entered the mainstream through the production of computers; however, up until then, the conceptual construct of the term was largely associated with notions of virtual reality (VR), popularised in movies and fiction. The vision of Gibson's cyberspace in *Neuromancer* (Gibson, 1984) was dramatically different to the practical application of interactive principles in GUIs on desktop computers. The transition from the 1980s to the 1990s saw the exponential rise of interactive applications, such as HyperCard, which was standard issue with Apple's personal computers, and a growing interest in collaboration evident in computer-supported cooperative work (CSCW) (Carroll, 2002). Early interactive technologies were predominantly stand-alone entities without the connectivity that is currently experienced on a daily basis. While there was some level of exchange between interactive technologies, file formats and transfers were limited, cumbersome and at times expensive.

Underpinning the web is hypertext, a concept coined by Ted Nelson (Nielson, 1995), in which text is not constrained to linear formats, but contains links to other text. The first imaginings of hypertext date back to 1945, when Vannevar Bush described Memex, a theoretical device 'which is mechanized so that it may be consulted with exceeding speed and flexibility' where individuals could store 'books, records, and communications' (Bush, 1945). Hypermedia is a similar concept, also coined by Nelson, but referring to non-sequentially linked media, such as images, movies or sounds. The release of commercial products such as Office Workstation Limited's (OWL's) Guide and Apple's HyperCard in the 1980s popularised the application of hypertext and coincided with the standardisation of image formats, making the sharing of images and visual data easier (Nielson, 1995; Myers, 1998; Carroll, 2002). In the 1990s hypertext became the standard protocol on the web, enabling global connectivity and convergence of different media types.

Despite the use of hypertext being easily understood, the web in the 1990s was perceived as highly technical, used only by specialised professions (Reid, 1995).

In 1993 the first graphical web browser, Mosaic, was released at no cost to Macintosh and PC users. The internet boom has been attributed to the emergence of Mosaic, as it enabled text and image to be uploaded to the internet simultaneously. Moreover, Mosaic shifted the perception of the web from niche to having a 'mass-market appeal' (Reid, 1995). The installation of Mosaic was simple, providing easier and more intuitive access to the web, but it was also praised for introducing pleasure into the web experience. Gary Wolfe wrote in *Wired* magazine that:

When it comes to smashing a paradigm, pleasure is not the most important thing. It is the only thing. If this sounds wrong, consider Mosaic. Mosaic is the celebrated graphical 'browser' that allows users to travel through the world of electronic information using a point-and-click interface. Mosaic's charming appearance encourages users to load their own documents onto the Net, including color photos, sound bites, video clips, and hypertext 'links' to other documents. By following the links – click, and the linked document appears – you can travel through the online world along paths of whim and intuition. Mosaic is not the most direct way to find online information. Nor is it the most powerful. It is merely the most pleasurable way, and in the 18 months since it was released, Mosaic has incited a rush of excitement and commercial energy unprecedented in the history of the Net (Wolfe, 1994).

The ensuing years saw unprecedented growth in web usage. The computer, through which the early web was accessed, shifted from a computational device to a communication tool and became widely available (Furnas, 2002). The web dominated the emergence of interactive technologies and everything from telecommunications, computers, television, refrigerators, marketing and electronic books to miscellaneous sales companies all wanted to be part of the 'information superhighway', a term popularised in the 1990s. Companies striving to be relevant in the digital domain drove demand for the production of interactive technologies that had web connectivity. In the push, interactivity became a buzzword that was applied to anything new (Crawford, 2005). Software developers created web authoring programs, such as Adobe's PageMill, Macromedia's Dreamweaver and Microsoft's FrontPage. *Business Week's* cover article in 1993 discussed the 'media mania' that had swept across the US, presenting insights that were a hybrid understanding of past and possible future media paradigms (Landler, *et al.*, 1993). By the late 1990s the web completely dominated emerging interactive technologies. In the 2010s the web has become more conducive to design (Nielson & Loranger, 2006), and connectivity and convergence are now found in additional objects, such as mobile applications.

### 3.2.2 Designers and the web

In Chapter 2, the introduction of the Macintosh was discussed in relation to the impact it had on the design process, visual expression, production and ways of thinking about design traditions. This was part one of the digital revolution that changed the way designers developed projects, the mediums they worked with and how they interacted with clients. Part two of the digital revolution occurred a decade later in the 1990s (Wolfe, 1994) with the emergence of the web as a mainstream communication platform. Still in its infancy, the web evoked the same response as the introduction of the Macintosh which divided opinions. Some designers were early adopters, embracing the web in their practice. Others were more circumspect, believing that table and cell structures limited visual expression. The web was exciting and new, and designers appeared simultaneously in awe and fear of its interactive and connective qualities. Graphic designers were challenged by aesthetic and stylistic constraints (Engholm, 2002), as well as the concept of time and non-linearity (Helfand, 2001; Shedroff, 2012). Designer and commentator Jessica Helfand (2001) challenged designers to provide new directions for typographic design as ‘comparisons with printed matter inevitably fail[ed], as words in the digital domain [were] processed with a speed unprecedented in the world of paper’. She encouraged designers to embrace the ‘diverse riches’ of interactivity and redefine typographic objectives. That said, multimedia designers were perceived as adequately equipped to transfer their knowledge to a web medium, however due to the limited conditions of the web – dial-up connections, low bandwidths and slow download times – the easy transition from the development of stand-alone interactive products to designing for the web was hindered. Both graphic and multimedia designers abhorred the idea that they had to conform to web standards and conventions (Siegel, 1996).

The web challenged the design profession and its traditions, both old and new. The availability of design tools, computers, software and networked technology renewed the argument that all one needed to be a web designer was access to equipment (Shedroff, 2012). Old arguments reignited as to the perceived value of design. The phrase ‘design for all’ resurfaced (Haig, 2002; Oudshoorn, *et al.*, 2004) and tensions between practice and technology surfaced as designers sensed impending changes through accelerated development and updates of interactive software that made design for the web more accessible for non-designers. Yet for all the talk of design democratisation, in reality the idea that someone could just do professional design without vocational training and specialised technical knowledge soon became highly contested. Rather than embrace the new breadth of design and the possibility of new complex collaborations, Shedroff (2012) describes the stalwarts who were ‘kicking [and] screaming’ against interactive formats. The debate was complicated by the lack of a definitive statement as to what

constituted a web designer and also a lack of coherency as to the best approach to web design, which in part were due to its rapid adoption by business, the decentralised development of web design by designers and non-designers, and the different technologies and design approaches employed.

The discourse of the web in the 1990s identifies two main viewpoints held by early adopters of web design. From a design perspective, designer David Siegel advocated an approach to web design that ensured that the designer maintained control of the visual representation of web design. Horrified that browsers interpreted web pages differently, Siegel encouraged a ‘guerrilla-terrorist approach’ to web design. He devised and promoted a series of ‘workarounds’ that used code to overcome the visual constraints of HTML and web standards. Notably, the single-pixel gif was one of Siegel’s famous workarounds that enabled more control over white space. Siegel’s approach to web design mirrored print layouts with a fixed canvas and controlled spatial relationships (Nielson, 1999; Allen, 2012). At the heart of Siegel’s book, *Creating Killer Websites*, was control, with the designer depicted as mediator, communicating information to an audience (Allen, 2012). The second perspective, typified by Jessica Helfand, perceived the web as entirely different to print, challenging designers to think of the web differently from the two-dimensional print paradigm (Helfand, 2001). She encouraged designers to break free of the box and design for transient and flexible boundaries. Helfand’s view is similar to DiNucci (1999), who, in *Print*, a trade magazine for designers, remarked that the early web was a prototype, commenting that while it was typified by static screens, eventually it would evolve into ‘interactive content [that was] universally accessible’. DiNucci asserted that ‘the days of one-size-fits-all [web] pages are over’ and that ‘no single set of pages can or should be created to fit all Web devices’. Allen (2012) argues that this perception is in contrast to Siegel’s approach to web design. Where DiNucci understood web design as an emerging practice and the web itself as an evolving medium, Siegel appeared fixated on replicating the printed page within interactive space and developing ‘fixes’ to ensure a web page would appear the same in all browsers. Despite that, *Creating Killer Websites* was the best-selling book at the time (Nielson & Loranger, 2006), which led to intense debates within the design community that were typified by Siegel and Nielson. Nielson asserted that killer websites killed business, as they prioritised aesthetic and a cool factor over usability (Nielson & Loranger, 2006).

Central to the problematic state of web design was designers’ understanding of interactivity. While designers had practical knowledge of interactive technologies, its terminology and metaphors played a role in promoting an approach, or way of thinking, about the web as a version of print, in which deep layers of interactivity

were not considered. An example is Siegel's description of three generations of the web: the first was typified by black and white or minimal colour and predominantly textual and linear structures; the second by the replacement of words with icons and the inclusion of tiled images; and the third by a focus on the overall experience, combining metaphors with consumer psychology (Siegel, 1996). Significantly, there is no mention of interactivity, suggesting that designers responded to the web purely from an aesthetic and layout perspective. While they looked to the future, imagining what the web would become, until it evolved and became less brittle, Siegel encouraged workarounds that mimicked print design.

Significantly, in the context of the web, designers perceived a return to the rigid structure, roles and rules associated with modernism. As discussed, modernist design had a distinct purpose in which form followed function and the use of image and text was utilitarian, communicating one message as opposed to interpretive design (Helfand, 2001; Meggs & Purvis, 2006). Designers transferred their pre-existing knowledge into a web paradigm and, when their assumptions could not be realised, they questioned the web's validity. In 2001 Helfand wrote that web designers were captured in a media format where 'visual expression filter[ed] through a protocol of uncompromising scripts.' Womack suggested that this was never going to change because the web was not inherently visual but rather driven by language (Womack, 2005) which was a significant shift in approach to design. By 2010 web capabilities had improved, expectations had increased and images were regularly used. Designers today understand the necessary role that site structure plays in developing functional sites; however, in the 1990s functionality had been abandoned and the idea that visuals could be programmed and developed mathematically or through language was in stark contradiction to the spontaneity and interpretive work of the 1980s.

Within postmodernism, the role of the audience shifted from passive to one where readers actively interpreted or decoded a message (Lupton, 2006; Drucker & McVarish, 2009). The emergence of interactive technologies in the 1980s forced designers to consider the audience in new ways; the computer was an information resource and entertainment device as well as a design and production tool (Helfand, 2001). The emergence of the web contributed to the ongoing broadening of the media landscape, demanding wider technical knowledge and skill, as well as rigorous methods to understand the user on a deeper level than before (Drucker & McVarish, 2009). Previously, designers had understood the audience either through market research or intuition. In the 1990s designers were said to have borrowed the term 'user' from the HCI field (Lupton, 2006) as a way of accurately describing the active involvement of the user. Nevertheless, the early web was associated with

entertainment, and therefore designers still thought about the user as an audience, even though they were required to understand and anticipate audience behaviour within an interactive environment (Trumbo, 1997; Drucker & McVarish, 2009). Since the 1990s there have been various terms deployed to describe the user, such as 'visitor', 'people', 'consumers' and 'audience' (Seigel, 1996; Barnum, 2010). While designers acknowledge users have changed and are more 'sophisticated and demanding' (Barnum, 2010), there is no outward demonstration of how they consider the user differently. This suggests they may still be formulating their understanding, and it is worthy of further examination.

### 3.2.3 Commercial design practice for the web

Chapter Two discussed how the emergence of commercial design practice in the industrial era softened the impact of industrialisation (Findeli, 2001; Heller, 2005; McCoy 2005). From these origins, design activity within a commercial domain was service-driven, engaging with clients to resolve 'wicked problems' and enhance communication (Rand, 1985; Buchanan, 1992; Meggs & Purvis, 2006). This heritage has shaped designers' unique role as the interface between the client and the audience – that is, solving communication issues and, as part of the process, defining the intended audience through scenarios developed using the designers' intuitive insight. Designers, as the mediators between business and the new user, were in a prime position to explore the communication potential of the web. However, pressure from business to 'stake a claim' in the web did not give them the opportunity to research and develop an approach to web design. Designers developing commercial websites were learning by night and creating by day, leaving little time for them to reflect on new approaches and relying on the transferal of old media frameworks.

Initially the business sector lacked the requisite knowledge about users: what they wanted, or how they wanted to use the web. They made assumptions that it was similar to television, but with a broader reach (Landler *et al.*, 1993). Allen argues that Berners-Lee's original vision for the web was co-opted by business for commercial purposes: rather than developing a shared information space with community values, business pursued the 'illusory goal of media convergence' (Allen, 2012). *Business Week* likened the commercial interest in the web to the gold-rush era, with businesses engaging in a land grab (Landler, *et al.*, 1993). Zeldman commented that the business attitude to the web was 'get it done any way you have to, make a buck, and move on' (Holzschlag, 2002). The speed with which business adopted the web as a marketing tool influenced the way in which websites were designed as a knee-jerk reaction rather than with a considered design strategy, and changed the trajectory of the web irrevocably (Allen, 2012). He posits that the dotcom crash in 2000 served to reset the web, shifting the emphasis back to how

people were actually using the web, compared with the business ideals of how they thought the web should be used (Allen, 2012).

The apparent problem was that the web was so new. Everyone wanted to be a part of it, but they were not sure exactly how to engage with it. The notions of convergence and connectivity were positive in theory, but in practise a number of professions sought to own the web as their specialised domain. In effect, they sought to limit what the web could be made to do by working within their own parameters, which was opposed to Berners-Lee's ideal of an open system of exchange. For example, designers' response, best typified by David Siegel, was to create cool websites that were developed as a display medium that entertained and delivered information. Siegel's websites prioritised design over usability and were controlled to ensure the aesthetic experience was replicated across various browsers and screens. In response to the proliferation of cool sites, Nielson published *Designing Web Usability: The Practice of Simplicity*, asserting that the web was a tool to empower rather than entertain. He specified commercial websites as those with business goals associated with undertaking and completing tasks (Nielson & Loranger, 2006). He asserted that websites with business goals were not limited to sales sites, but included news services, non-profit organisations and government agencies. Basically, they were websites whose purpose was (and still is) to attract and enable users to accomplish tasks. While Nielson (2000) advocated for memorable and satisfying web experiences, he argued that usable functionality would achieve this over design and aesthetic.

Therefore, the way in which commercial design practice for the web emerged was decentralised and occurred amidst tensions between design and non-design professions. Turf wars focussed on best practice for the web and in the process defined the essence of the web as convergence and collaboration. The new digital space required a much wider set of skills than any one profession, and it was this notion of collaboration that challenged many professions at the time. While collaboration was not a new concept in design, for the web it required a much deeper engagement that extended beyond professional distinctions and blurred the boundaries between discrete practices (Grefé, 2000). What is fascinating about the early web is that early adopters embraced it with a lack of understanding of the implications of convergence and connectivity. As a result, there was a tendency to rely on familiar frameworks to make sense of the web, resulting in static websites (DiNucci, 1999) that were visually controlled and that circumvented the very qualities that made the web revolutionary.

The web can be said to reflect growing sophistication and pluralism in contemporary culture (Buchanan, 2000). Users are increasingly expressing opinions, reporting on world events and contributing content to websites such as Wikipedia,

YouTube, and Myspace. The increasing interconnectivity between networked devices has altered the way in which users receive or choose to receive information. This is in marked contrast to the relatively passive experience of television, where users are subjected to channel programming based on assumptions about their tastes and the economics of the television industry. With changing expectations on how information is created and received, it is of critical importance that designers acknowledge increasing user control so that they can better develop web design that accommodates users' needs.

The web has not only altered the way users receive information, it has also altered the users' expectations of the types of information they choose to receive, highlighting a need within the design process for more user input. Designers can work in a manner that involves users throughout the design process, eliciting knowledge – such as likes, dislikes, language, culture and lifestyle – that guides the creation of the final design product. This practice, called user-centred design, deviates from tradition, in which the designer was the creative authority (Gleeson, 1996). Designers need intimate knowledge of their user, the types of interactions they desire and, importantly, how the website affects the user. Because of the web's enormity and the ease with which users can enter or exit a website, user-centred design becomes a crucial method used to understand the user and inform the design. While user-centred design is not a new theory, there are barriers to its use in design, with researchers questioning the extent to which the user is actually involved in the design process and the degree to which designers are prepared to relinquish their intuitive practice.

### 3.2.4 The web and interactivity

Until the emergence of the web, interactivity was largely the focus of research in HCI in diverse areas such as VR, augmented reality (AR), Grimes's digital data entry gloves, artificial intelligence (AI), computing and associated studies such as the mouse, direct manipulation of graphical objects, windows, hypertext, text editing and gesture recognition (Rauterberg, 2002; Myers, 1998). In the areas of VR, AR and AI, interactivity was perceived as a means of enacting alternate or simulated realities or, at least, facilitating a portal through which to access them. In the 1980s the concept of interactivity was realised commercially with the production of desktop computers and related objects and software (Myers, 1998). Increasing familiarity with interactivity in a practical context was further attained through the production of CD-ROMs, whose content was primarily entertainment in the form of games such as *Myst*, Peter Gabriel's *Secret World* or children's edutainment media. Typical of interactive media in the 1990s, these products were stand-alone entities without the connective qualities of the web.

The multifaceted nature of interactivity on the web was not initially well understood, and it required a visual manifestation in order for users to make sense of the digital space. It was this transition that was critical, shifting interactivity from a highly specialised construct to a normalised and accessible form on the web, achieving the universality that Berners-Lee had envisioned (Berners-Lee, 1999). As such, the focus of interactivity as a concept shifted from a technological orientation to one that was concerned with people (Polaine, 2010; Crawford 2005). Berners-Lee deployed hypertext as a uniform web standard to ensure that universality was optimised. While HCI proponents implemented web standards to guarantee accessibility and usability, they also expected users to conform or adapt to the technology (Polaine, 2010). Designers, on the other hand, sought to work outside web standards and HTML, justifying this approach as a method that catered for the individual and diverse needs of the audience (Siegel, 1996). The difference in approach between design and HCI is significant, as it highlights the diversity in which the user is considered.

For designers, earlier ideas of interactive media had manifested through interactive software and the emergence of multimedia design. Designers choosing to work in this area were more likely to work with motion and narratives in non-linear structures that allowed the audience to navigate their own journey. The new interactive space and the prevailing postmodern condition was the catalyst for redefining the audience from a passive reader to one that was actively engaged in constructing meaning through activities. Drucker and McVarish (2009) describe the shift in practice in the 1990s, when designers were not only communicating to an audience, but also developing scenarios in dynamic and functional environments with invisible infrastructures. This trajectory accelerated with the emergence of the web due to its rapid uptake in the commercial domain. As a result, designers were required to consider the audience from a cognitive perspective and devise ways to orientate them, while at the same time integrating interactivity seamlessly to ensure the website was a familiar environment. Designers sourced familiar metaphors and visual language that contextualised interactive functions so that the audience learnt from previous interactions and transferred that knowledge to future ones. Within a web environment, interactivity was contextualised in research paradigms as a tool that empowered the user rather than a conceptual construct.

### **3.2.5 Articulating web design**

Writing about web design, and its interpretation thereof, has been prolific since the web's emergence, and this material can be divided into three main categories: popular media, which describes the web in broad brush strokes and demonstrates

how to build successful and efficient websites (Siegel 1996; DiNucci *et al.*, 1998); research, which is technical in its focus; and blog discussions, which are more informal, focussing on specific technical discussions as well as comprehensive overviews. Even though the literature itself is extensive, within the design domain research into commercial web design has been sparse, with the majority of the discourse oscillating between broad commentary and specific technical details.

The broader ‘how-to’ books, providing step-by-step guides to building websites, initially typified popular writing in design. In *Elements of Web Design*, DiNucci *et al.*, (1998) proclaimed that ‘designing for the web isn’t hard’ to do, due to the proliferation of web-authoring software and ever-expanding web standards. Siegel’s *Creating Killer Web Sites: The Art of Third-Generation Site Design*, also written for the design community, aimed to empower designers by communicating his experience and providing methods to work around the limitations of HTML. These and similar texts at the time attempted to make sense of the new medium, to communicate how it functioned and what could be achieved. Moreover, they both discussed existing design knowledge and what was relevant to the web. Although written at a similar time and for the same audience, these books presented opposing approaches to web design. While Siegel advocated an approach that mimicked print to achieve control over the visual display of a page (Siegel, 1996; Allen, 2012), DiNucci *et al.* disagreed with this method:

A lot of businesses approach the Web with a print media standard of design. They’re missing the capabilities of feedback and interaction, which are 90 percent of what makes the web powerful. (Loudon in DiNucci *et al.*, 1998, p.179).

Furthermore, in their chapter on interactivity, DiNucci *et al.* (1998) explain user behaviours associated with this term, including asking questions and receiving answers, customising page views, being able to determine a unique line of enquiry, purchasing online, interacting with other users, and exchanging information globally. Siegel, on the other hand, does not define interactivity. Both books share some similarities, such as tips for managing space – Siegel speaks of the 1-pixel gif and DiNucci *et al.* highlights tips for controlling layout with the <PRE> (preformatted text) tag. DiNucci *et al.* champions an approach to web design that works within web standards and acknowledges the design differences between print and web, whereas Siegel maintains control to ensure effective communication.

Over the past two decades the technical conversation has been sustained through blogs and online forums that include designers and developers in discussion. Zeldman.com (1995–) is home to *The Big Web Show*, in which ideas, industry, people, specifications, standards, the state of the web and web design

history are discussed in episodes that can be accessed via the web through the site, RSS feeds and iTunes Audio. The blog *24 ways to impress your friends* (1998–) contains a range of technical tips couched within a design framework. Designers and developers discuss their perception of practice in fields such as user experience (UX), visual language, typographic design, JavaScript, CSS3 and HTML5 Video in sites such as 24ways.org (2011). Similarly, web design companies throughout the world use blogs or forums to communicate their technical understanding. DTDigital, for example, has a blog containing a range of posts discussing digital advertising, communication strategies, social media, web strategies and iPad techniques, amongst other topics. They have used the blog to position their group as thought leaders within the digital domain as well as technical gurus. These blogs typify a myriad of technical discussions that commenced in the 1990s and are ongoing due to the constant evolution of web standards and the increasing capacity of the web.

Concurrent with the technical literature in the early web was an ongoing commentary from designers and design commentators, who discussed the emergence of the web and its immediate impact. The web phenomenon was discussed in the *Looking Closer* anthologies, *Eye* and other trade publications. In these articles, discussion of the web and screen design was either utopian or pessimistic. Some designers predicted the demise of print (Siegel, 1996), while others examined the communication potential of the web (Helfand, 2001), the birth of the user (Lupton, 2006), digital metaphors and the possibilities for the future web (Helfand, 2001). Coming to grips with new forms of media delivery and dialogue, writers questioned whether the web could be immersive in the same way as virtual reality (Julier, 2000). While some commentators recommended that design needed new theoretical frameworks that encompassed spatial relationships (Buchanan, 2000; Cooper in Buchanan, 2000; Drenttel in Buchanan, 2000; Helfand, 2001; Julier, 2000; Shedroff 2001), others bemoaned the lack of design practitioners involved in shaping design within the new digital space (Helfand, 2001), implying that not all practitioners realised the full implications of the web on design. Designer Jeffrey Veen (2001) describes how he and other designers faced similar predicaments, in which he was producing commercial products for web delivery while simultaneously learning, understanding and making sense of the medium, which left little time for critical evaluation.

Early research into the web emerged from scientific fields such as HCI and was rational in approach, focussing primarily on performance-based usability and functionality issues. Compared with design, HCI had a rich tradition of research methods pertaining to interaction between humans and computers that could be applied to the examination of the web. While some sections of the design

community had recently become research active (Saffer, 2010), design research was still in its infancy and did not contribute to the discourse of web design.

In his thesis, Haig argues that two problems emerged in early research of the web. First, there was little research into the aesthetics of web design. Second, of the research that was undertaken, most was based on websites developed by non-designers (Haig, 2002; Helfand, 2001). Attempting to understand the aesthetic and design performance of the web, Haig evaluated a series of websites with varying levels of design. Using samples from both design and non-design communities, Haig assessed the importance of aesthetics and design in achieving user engagement. His study not only demonstrated the value of aesthetics and design in achieving user engagement, but also highlighted a gap in research undertaken into the nature of professional design for the web.

Similarly, Engholm (2002) examined the aesthetic phenomena of the web, exploring its graphic style within the framework of design history. In her study, Engholm developed a method of mapping the stylistic approach of websites such as trash, lo-fi grunge and pixelism in comparison with historical styles such as the Swiss Style, Modernism and Avant-Garde styles. Engholm's findings suggested that mapping stylistic approaches was promising as an analytical instrument, and that this method merited further discussion.

Detailed studies have been undertaken that have tested user response times to web advertising, ranging from political candidate sites, to pop-up advertising and banner ads (Diao & Sundar, 2004; McMillan & Hwang, 2002; Stromer-Galley & Foot, 2002;). Research into online education has been widespread, addressing cognition and student retention, as well as effective design of scaffolds and supports that engage students and encourage independent learning (Galer, 2003; Herrington *et al.*, 2003; Lambert, 2003; McLoughlin, 2002). More recently, research into commercial design, including non-profit websites, e-learning and government agencies, has investigated the impact of social buying networks and education and social networks. The same research has also examined the user, their behaviours and expectations.

As communication design emerged, there was little academic research exploring the connections between its practice and the web, and even less about designers' perception of the web. In 2001, Helfand asked, where all the designers were in conversations regarding screen media and the web. A decade later there is still a lack of historical or academic research into the web from a communication design perspective. While Drucker and McVarish (2009) discuss the effects of new media on graphic design, they do not explore the web in detail, and they suggest that communication designers are still in the process of consolidating the web into

practice. Lenander (2008) asked what it means to be a digital designer, with the objective of encouraging transitional designers to move from print to web in order to re-examine design fundamentals, and to look forward to understanding how those fundamentals translated to the web in ways that were progressive and not reliant on old thinking and practice. Heller's (2008) objective was to discuss good design in relation to the web, as he believed designers were becoming acquiescent. What is apparent from popular books, though is that they date quickly due to their subject matter. Therefore, to examine the translation of communication design or designers' perception in any sort of depth, it has been necessary to look at informal channels of discussion, which can be found in blogs and online forums.

In addition to technical assistance, designers use blogs and forums as places where they can express their opinions and perceptions of web design (Heller, 2006, AIGA.org, 2012; alistapart, 1998–). Burgoyne's (2006) examination of designers' blogs suggested that, through blogs, designers are continuously questioning and formulating new ideas and keeping abreast of technology. *Design Observer*, *AIGA* and *Alistapart* all contain blogs that feature ongoing commentary on design and the web, forming the basis for ongoing dialogue both online and offline. An example is Nathan Shedroff's recent post, in which he raised concern at AIGA's apparent marginalisation of screen media (Shedroff, 2012). At the grassroots level these blog discussions provide a more holistic and authentic view of an emerging practice than the promotional spin that occurs in popular writing. In relation to this study, the design perspectives offered by blogs were important because they provided candid insights into how designers think. Yet, despite these glimpses into designers' perceptions, it was surprising that there was still very little discussion about interactivity. While there was discussion relating to the principles of design, typography, code, visual language and cool sites, interactivity on the web was rarely mentioned. On a rare occasion when it was discussed, Collison (2011) describes interactivity as residing within design principles. He speaks of it as pertaining to movement, meaning that design elements such as dot, point, line, scale, tension and dynamics can be assigned interactive behaviours that make objects responsive.

### 3.2.6 Conclusion

Over the past two decades there have been rapid advances in the ways in which internet technologies support interactivity in web design. Development of software packages has made extensive, high-end web design more easily achieved by professional designers. As the web has become a richer design environment, traditional graphic design studios have transitioned into communication design by including web design in their portfolio. With the introduction of broadband and its faster download and response times, different types of interactivity became achievable. These developments have widened the scope of what the web could do

and be made to do. Yet for all the technical advances that have made good design for the web easier to achieve, there is a lack of clarity surrounding how designers perceive and utilise interactivity to achieve good design, both on an aesthetic and functional level. While there has been prolific writing on web design, the informal contribution from designers on blogs has not shed light on their approach or thoughts on the increased scope of practice.

Reviewing the literature highlights that in the first decade of the web, designers were focussed on experimentation with interactivity in web design. They did not try to define it and rarely articulated what the term meant in practice. There was a dislocation between interactivity in VR's alternate reality and interactivity on the web, yet it was on the web that designers attempted to normalise the concept through visual design. By deploying metaphors and visual language, designers sought to accommodate the user by making websites functional and more intuitive. In the transition from print to the web, designers endeavoured to control the visual representation of the page, just as they had done so previously. In doing so they made tailored websites with predetermined options for navigation. However, this approach was criticised as undermining the full potential of interactivity. Over time, with increased use of and growing familiarity with interactivity, designers capitalised on the multi-dimensional nature of interactivity on the web (Sankarayya 2011; Bonds, 2011). Even so, the lack of clear articulation about interactivity continues to plague designers, and simultaneously writers have questioned whether designers are 'ruining the web' (Naughton in Montgomery, 2012). It is therefore necessary to examine the contributions of communication design to the web in order to understand whether they have influenced interactivity and how it is used on the web.

### 3.3 | Different contexts of interactivity

As already mentioned, interactivity is a contested term, the meaning of which has been examined and debated by researchers, developers and academics. In 2002, McMillan and Hwang developed a taxonomy to classify how interactivity had been defined. In their paper, they argued it interactivity had been described as a process, a set of features and a perceptual-based concept (McMillan & Hwang, 2002). As a process, definitions of interactivity have focussed on its capacity to facilitate exchange, responsiveness and real-time participation. With regard to interactive features, definitions of interactivity have centred on features that enable the process to occur, such as those that enable two-way communication, feedback and user control. McMillan and Hwang argue that researchers have primarily focussed on interactive systems and features, rather than reviewing interactivity as a perceptual concept, because systems and features were easier to operationalise and measure. Defining interactivity as a perceptual concept has

focussed on user-centred aspects, such as user control, speed, effort, responsiveness and the functionality of the environment. Stromer-Galley (2004) suggests that research into interactivity is complex because of the lack of contextual clarity and the tendency to think of it as a single-minded proposition rather than a multifaceted concept. She argues that interactivity can be defined as two distinct phenomena. The first is embodied interaction that has an associated sense of physical presence, like that which occurs in a face-to-face context. The second takes in the physical settings, artefacts, technologies, and non-linguistic sign-systems implicated in social interaction and shared cognition. Adding to this complexity is the ever changing technological landscape and the lag between theory and practice (Barnard *et al.*, 2002).

In order to better understand the current context of interactivity outside design it is necessary to examine different fields of practice and their perspectives on the term. For the purpose of this study, the fields of HCI, communication theory and interaction design have been chosen, based on their traditions of research and reflexive practise. Their diverse views on interactivity provide a rich starting point for research into how designers understand interactivity. This study examines designers foundations to understand how their beliefs and practices, prior to the emergence of digital technologies have shaped their current understanding of interactivity. Similarities and differences will be compared and reviewed within the context of networked technologies, with the intention of forming a general theory of interactivity that will be examined in further depth as part of this study.

### **3.3.1 A human-computer interaction perspective**

In the 1980s four independent areas of research united to form what is now known as HCI. This interdisciplinary field covers the study, planning and implementation of interactions between human and machine (Barnard *et al.*, 2002; Haig, 2002; Saffer, 2010). It brings together specialist knowledge from prototyping and iterative development from software engineering; software psychology and human factors of computing systems; user-interface software from computer graphics; and models, theories and frameworks from cognitive science (Carroll, 2002). While the field has grown in scope since the 1980s, Carroll argues that these four areas still underpin the current research. As such, HCI has an extensive research base that draws on knowledge gained prior to the first computers from the areas of social sciences, behavioural studies, communication theory, linguistics, cognitive psychology, engineering, computer science, operating systems, programming languages and design (Hewett *et al.*, 2009). The scope of HCI is vast and continuously increasing, based on technological advancements that range from physical interactions – such as Engelbart's<sup>2</sup> invention and subsequent development of the computer mouse in

1963 (Edwards, 2008), ubiquitous computing (Weiser, 1991) and computer-supported collaborative work (Carroll, 2002; Quintana *et al.*, 2002), to the intelligence and fluency of the computer (Winograd in Moggridge, 2007).

Educator John Carroll (2002) explains that prior to the emergence of HCI, ‘explicit consideration of the needs, abilities and preferences of their ultimate user was not a dominant view’ of early computer specialists. The focus was on efficient computations and information processing (Card, Moran & Newell, 1983). Carroll notes how this attitude changed in the 1980s and 1990s as cognitive science methods and theories, such as a user-centred system of development, began to inform computer hardware and software development. Sutcliffe (2002) argues that the fundamental mission of HCI was to integrate psychology and sociology with computing to inform the design of objects and systems that facilitated interactions. As a result, much of the research in the HCI field falls within two categories: the computer side and the human side (Card in Moggridge, 2007). The computer perspective focusses on the technological components of the interaction, while the human perspective examines the phenomena that surround interactions (Newell, Perlis & Simon in Hewett *et al.*, 2009): the pre-cognitive basis of human existence (Merleau-Ponty in Svanæs, 2000) and symbolic and non-symbolic interaction (Heidegger in Svanæs, 2000). Even though the focus of computers and humans are diverse, within an HCI paradigm they share the common ideal of usability. Thus, the literature highlights a rigorous and dynamic synergy between the fields, producing computer technology that people want to use and are able to use (Carroll, 2002; Moggridge, 2007).

The beginning of HCI has been linked to the 1982 National Bureau of Standards ‘Human Factors in Computers Systems’ conference, in the United States (Carroll, 2002), but the need for psychology to inform computer developments had been acknowledged prior to the 1980s (Card in Moggridge, 2007). In 1974, Card joined Engelbart and English<sup>3</sup> at PARC<sup>4</sup> to examine the performance of input devices (Moggridge, 2007). Card sought to develop a pragmatic computer science that

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2 Doug Engelbart is renowned for his invention of the mouse in 1963 when he was working at Stanford Research Institute (SRI). His prevailing idea in the 1950s was that people ought to be able to interact directly with computers.

3 Bill English partnered Engelbart in the production of the mouse. English was an engineer, and while Engelbart has been acknowledged for the idea and invention of the mouse, English has been acknowledged for the actual production.

4 PARC (Palo Alto Research Centre Incorporated) was a research and development division of Xerox. Founded as Xerox PARC in the 1970s, PARC is responsible for major contributions to developments such as laser printing, the ethernet, personal computers, GUIs and object-oriented programming amongst other areas related to ubiquitous computing.

could be applied and evaluated in the iterative stages of computer development. Card's realisation of a supporting science that connected theory and psychology of people to the science of computations was invaluable (Moggridge, 2007; Nielson & Loranger, 2006). Sutcliffe (2002) describes the nexus between cognitive science and engineering as the 'Holy Grail' for HCI researchers, which would allow decisions to be informed by the people they were designing for. This view was not shared universally across the HCI field, and usability experts argued that functionality and usability were more important than design or, more specifically, aesthetics (Haig, 2002; Enghlom, 2002). The adoption of Nielson's (2000) Theory of System Acceptance, defined usability as 'learning, efficiency, memorability, errors and satisfaction', highlighting the marginalisation of aesthetics over pragmatism in design for the early web (Haig, 2002). A decade on, Nielson acknowledges the value of design on the web, but even in an environment of increased download capacity, suggests that it is still a fundamental error to prioritise aesthetics over usability:

As we continue to research different aspects of Web usability, it's striking how often the early findings are confirmed, even as newer studies result in more nuanced understanding and more detailed guidelines. For this reason, we expect usability issues to continue to be of major importance for many years to come (Nielson & Loranger, 2006, p.121)

It is important to note that design has been perceived as integral to HCI since its inception (Winograd & Flores, 1986; Carroll, 2002; Sutcliffe, 2002; Moggridge, 2007). Even so, scholars have argued that HCI has a particular view of design that is rationalistic and, while design may be integral, that it has an engineering aspect that is technologically focussed (Polaine, 2010) rather than human-centred in design. It has been widely argued that HCI should be more tolerant towards intuitive design practice (Hassenzahl, 2004; Saffer, 2010; Polaine, 2010; Forlizzi *et al.*, 2008), particularly since the emergence of the web, when the focus shifted from individual task orientation (which HCI was an interface to the software) to considering the computer as an interface to information, tasks *and* people (Furnas, 2002). However, even with the emergence of the web, those in the HCI field are divided in their perceptions and inclusion of design that is considered fuzzy and incalculable. Bartneck believes that these attitudes have contributed to rifts within the HCI community (Bartneck, 2009).

Therefore, within the context of HCI and its prior incarnations, interactivity is a system or process that facilitates interactions. Rauterberg (2002) states that interactivity is defined by the 'extent to which a user can modify form and content of a mediated environment'. It is curious that in HCI literature there are few direct references to the term interactivity. Instead, the term is implicit within discussions

about diverse research areas, ranging from GUIs, windows and the mouse (Myers, 1998) to computer-supported collaboration, distributed cognition, augmented reality, and voice and gesture recognition (Rauterberg, 2002). What is evident in the literature is that interactivity underpins all the research and development into interactions, interactors and interactive environments. To understand interactivity from an HCI perspective, therefore, it is necessary to understand the outcomes it enables. Interaction is an exchange between a person and a machine. However, it has also been suggested that, with the emergence of the web, interaction is not limited to person and machine, but includes user-to-user and user-to-document models of interactivity. 'Interactors' is a term used in subsets of HCI to refer to users, computers, teams or things that interact without the semantic associations of each of these terms (Barnard *et al.*, 2002). An interactor's behaviour can be measured over time. Interactive environments are similar to Rauterberg's definition: an environment in which a user can modify the content or form of the environment. In the context of the 1980s and 1990s this was very much based on the computer-mediated environment. However, with the rise of ubiquitous computing, Winograd describes how the computer is invisible, and even though we interact through it, the interactive environment is all around us (Winograd in Moggridge, 2007).

### 3.3.2 Communication theory

Communication theory informs specialised fields including media and cultural studies and, more specifically, media production, political economics, journalism and media psychology. More recently, communication theory has focussed on the areas of online communication, mobile devices and electronic media (Lievrouw, 2006; Flew, 2008). It draws on research traditions from the humanities and social sciences that have been primarily concerned with audience, narrative, messages and meaning, and the impact of mass media. Within the broad scope of communication theory, interactivity as a concept has been interrogated relentlessly and discussed metaphorically and historically, as well as within a contemporary context (Marvin, 1988; Leonhirth *et al.*, 1997; Huhtamo, 1999; Polaine, 2010). It is within communication and media theory that the bulk of definitions have emerged which attempt to establish theoretical frameworks that explain the phenomenon of interactivity.

At the turn of the century it was argued that interactivity was under-examined and undefined (Hansen *et al.*, Heeter, Huhtamo, Miller *et al.*, Rafaeli, Schultz, Sims, Smethers in McMillan, 2006). Subsequent efforts to define interactivity produced a myriad of definitions in varying contexts across a range of technologies. While some of these definitions shared commonalities, Heeter suggests that each was skewed to suit the authors' intentions, tools and competencies (Heeter, 2000; Aarseth, 2004).

Polaine describes a rush 'to own a definition of interactivity' by scholars and academic disciplines (Polaine, 2010). Bucy (2004) also argues that scholars became preoccupied with defining interactivity and suggests that this fixation was detrimental to the overall development of a theory of interactivity as a phenomenon operating within a social context. Despite the abundance of definitions, Bucy contends that most of the studies have focussed on describing and classifying interactivity rather than 'predicting and testing' or, in other words, operationalising the term. Polaine (2010), critical of the way in which communication theorists have appropriated existing media forms and cultural values to explain interactivity, states that old media paradigms used to describe it are 'weak and impotent'. He argues that much of the literature from media and cultural theory has contributed little to establishing new languages that encompass the breadth and possibilities afforded by interactivity.

While interactivity as a concept can be traced back to the proposed Memex (Bush, 1945) and research in computer engineering and HCI, misconceptions of interactivity stem from how it was understood as a popular term associated with new media. As already mentioned, the term new media was a construct invented in the 1990s to differentiate earlier mass media channels from new ones that afforded the audience an immediate and responsive experience involving choice and selectivity (Lievrouw, 2006). Early discussions of new media identified interactivity as the core component that facilitated the changes and made new media new. While there was consensus that interactivity was a critical component of new media and associated technologies (Williams *et al.*, 1988; Rafaeli, 1988; Carey, 1989; Pavlik, 1998), McMillan and Hwang emphasised the challenge involved with developing 'a common concept of interactivity that [was] applicable to all types of interactive communications' (McMillan & Hwang, 2002).

Attempts to define interactivity have highlighted changes from its emergence in new media to how it is defined in the web. Characteristics such as control, exchange, non-linearity, immediacy and choice were the hallmarks of the new media environment prior to the web. Once the web emerged, the idea of what constituted interactivity shifted and was associated with connectivity, reciprocal exchange, the changing role of the audience, and convergence. As the characteristics of interactivity increased, some definitions contradicted how it had been previously defined (Bucy, 2004; McMillan, 2006). Rather than finding a common thread, Bucy (2004) argues that, after three decades, we are no closer to a shared understanding of the term; including what it is and what it does. Bucy attributes this lack of success to the examination of interactivity as a single-minded proposition within the context of specific studies. Rather than a broad overarching theory of interactivity, there is an assortment of definitions that vary based on

the context in which the term is used. Bucy suggests that there is a need to delimit the context of interactivity to mediated interactions and to locate it within user experiences with technology in order to achieve definitional agreement that can then be used in empirical research.

As a characteristic of new media channels including the web, interactivity was perceived as providing new avenues for human communication via computers. Rafaeli's (1988) early definition of interactivity explored asynchronicity and the relatedness of email exchanges, 'where any third transmission relating to a previous exchange form[ed] the basis of interactivity'. This definition was revised to include 'the extent to which later messages in a sequence relate to each other, and especially the extent to which later messages recount the relatedness of earlier messages' (Rafaeli & Sudweeks, 1997). Zack (1993) perceived interactivity to involve the simultaneous and continuous exchange of information. Haeckel (1998) stated that the essence of interactivity was exchange and Pavlik (1998) observed that 'interactivity means two-way communication between source and receiver, or, more broadly multidirectional communication between any number of sources and receivers'. Other discourses of interactivity relevant to communication within the web environment examined the perception of users (Wu, 1999; McMillan & Hwang, 2002; Stromer-Galley & Foot, 2002; Sundar *et al.*, 2003), the social and political impact of the interactive web (Stromer-Galley, 2003; Bucy, 2004) and the measures of perceived interactivity in relation to advertising on the web (McMillan & Hwang, 2002).

From a communication perspective, interactivity within the web is perceived as a tool that expedites an immediate exchange of information through tasks, conversation, distribution and collaboration. It is also perceived as relating to communication between people via the computer and has perceptual qualities associated with the term that reside in individual perceptions (McMillan & Hwang, 2002; Bucy & Tao, 2007). The audience has a new role that is less passive and that requires them to actively engage with interactive characteristics on screen. Therefore a primary concern for communication theorists has been the scope of interactivity, types of exchange, the implications for the audience, and their changing behaviours, expectations and ways of creating meaning via collaboration. Communication theory, like HCI, is extensive and has bearing on communication design practice, particularly within design for the web. The thrust of Bucy's argument has been that the majority of theoretical frameworks conceptualised in communication theory have been poorly operationalised, leaving us unable to measure interactivity and none the wiser as to what it is (Bucy 2004; Bucy & Tao, 2007).

Examining the literature in communication theory reveals a wide body of

research in media theory, including the different methods scholars have used to examine interactivity, the impact of new technologies on the audience and the changing perception of the audience as users and producers. The key position is that the concept of the audience is critical in media theory, regardless of the type of technology being discussed, but technological change is changing ideas about audiences in respect to their behaviour, outlook and situation (Livingstone, 2004). In recent decades, media theory has used a diversity of frameworks to examine the nature and circumstances of media audiences, as reflected in a chronological sampling of studies beginning with Laurel's (1993) examination of the computer as theatre, Murray's (2004) writing on cyberdrama, and Manovich's (2001), Bolter and Grusin's (1999) and Bruns's (2008) publications on the new languages of interactivity. Linking much of this discussion is the representation of the audience member as an active user of technology – a focus on the participatory nature of interactivity transforming the nature and role of audiences through the capacity to facilitate exchange and interchange.

Media theory highlights the meshing of old and new language in a way that normalises interactivity and describes new scenarios. Bolter and Grusin (1999) introduce the term remediation to identify a characteristic of new media: its 'representation of one medium in [or through] another'. They identify various types of remediation that are supported by the work of Laurel, Murray and Manovich, which discusses how the form, concept and operation of new media simultaneously transforms and preserves key aspects of literature, theatre and cinema, especially with respect to interactivity. For example, Laurel draws parallels between interaction and theatre techniques such as improvisation. She argues that effective interaction design engages users in an experience involving thought and emotion (Laurel, 1993), contending that deep understanding of dramatic theory and technique can shed light on the aims and objectives of interaction design. However, unlike audiences in the fields of theatre, cinema or television, Laurel highlights how consumers of media content via the computer become active users rather than passive recipients, interactivity enabling 'first-person story telling' in which people's active navigation through media content modulates meaning and experience. Murray (2004) explores the notion of multiple narratives that afford users the experience of agency. Manovich's (2001) writing uses cinematic paradigms to analyse the language of interactivity and the user's active contribution to meaning generation. Crawford (2005) furthers this discussion by arguing that deep engagement in interactivity has comparable qualities to the process of 'listening, thinking and speaking' in face-to-face encounters between people.

Bruns's (2008) introduction of the term 'produsage' reinforces the idea that relations between old and new media are both continuous and disjunctive. For Bruns, produsage is an effect of the manifestation of distributed knowledge as exemplified by the role of everyday people in leading content development for websites such as Wikipedia and for blog sites that allow a community of users to produce a body of knowledge through a collective and iterative process. Prior to Bruns's coining of the term produsage in 2008, earlier studies recognise the phenomenon, such as McMillan and Hwang's (2002) work on a taxonomy that identifies interactivity as a multi-faceted concept in which exchange, interchange and user activity are key to the categorisations of interactivity as a process, feature and perceptual-based concept. McMillan's (2006) exploration of models of interactivity and Jensen's (1998, 2008) taxonomy of interactivity establish exchange, responsiveness, playfulness and user distribution as key characteristics of the user as an active agent. Polaine (2005, 2010) rejects the repurposing of existing theoretical precepts from the study of language and old media to explain interactivity because they mask the unique affordances and potentialities of interactivity. The concept of produsage falls outside the scope of this thesis. Nevertheless, the idea of the rise of participatory culture is an important context for media theory's conceptualisation of people as keenly involved with the generation of content and meaning. There is a parity here with the aims and objectives of commercial web design, including the key frameworks for its analysis and evaluation, as discussed in detail in Chapter 4.

Another approach explored 'idealised information traffic patterns' using an adapted version of Bordewijk and Kaam's model (1986) to develop a typology of interactivity appropriate for interactive television (Jensen, 1996). Initially the typology for interactivity was based on social power relations and power positions, comprising different types of information traffic patterns. It was developed independently from specific media types, presentation and content, focussing on the power within information patterns. Ten years later in a changed media landscape, Jensen (2008) revisited the typology in order to capture new media formats, elements within new media, and the user experience. Jensen's matrices demonstrate the complex and changing nature of the media landscape and can be used as a theory and framework that underpins future development of interactive media in which the user assumes more control in the area of content creation, production and filtering, specifically in the area of interactive television and mobile devices. McMillan and Hwang (2002) recognised interactivity as a multi-dimensional construct and developed a scale to measure perception-based approaches to interactivity: measures of perceived interactivity (MPI). Their tripartite taxonomy highlights interactivity as the significant overlap between its different dimensions:

- Interactivity as a process
- Interactivity as a set of features
- Interactivity as a perception.

Through this tool they sought to develop a framework in which the advertising field could better understand the perceptual base of the user. Literature concerning media and cultural studies is concerned with the audience and the shift in audience behaviour and expectations within a new media context. Livingstone (2004) examined the role of changing audiences by asking eight questions of different audience types: those engaged with mass-media and those involved in new media. The findings revealed that, despite technological changes, the concept of the audience continued to be critical in communication analysis (Livingstone, 2004). Manovich's (2001) notion of interactivity was psychological, approaching the audience as readers who interpreted and made mental connections as a form of active engagement in the media. Jensen's (2008) concept of interactivity was a model proposed for use in research concerning interactive television in order to understand information flow and power relations.

Within media frameworks, it is worth noting the multiple descriptions of interactivity, as well as the diverse understandings of a changing audience. The term *produsage* refers to the new role of everyday people as producers of content for the web, (for example, user-led websites such as Wikipedia and blog sites). Hallmarks of *produsage* are the iterative and incremental changes to established knowledge made by a community of users, in which participants contribute to the establishment of collective and distributed knowledge (Bruns, 2008). User-generated content (UGC) and the exponential rise of blogs and content management sites (CMS) such as Wordpress and Tumblr, empowered users to publish their own content, whether it is personal or political. The rise of blogs shifted the notion of the audience to one in which they are active in the act of communication, whether they are uploading content or commenting on others content, which is a highly significant shift. As discussed, the concept of *produsage* falls beyond the scope of this thesis, yet it is important to highlight the changing identity of the audience and compare whether the same shift has occurred within design for the web.

### 3.3.3 Interaction design

Interaction design emerged as a formalised discipline in the 1990s, at the intersection of industrial design, communication design and computer science (Boyarski & Buchanan, 1994; Moggridge, 2007). Saffer (2010) claims that the underlying premise of interaction design dates back to tribal cultures and systems developed to communicate. He remarks that interaction design prior to its

appellation was evident in the invention and development of systems that enabled the realisation of Morse code, the telephone, radio and television (Saffer, 2010). Moggridge (1999) states that interaction design is about a designed experience that connects people through the products they use, while Crampton Smith extends the notion of interaction design by describing it as inherently social, suggesting that interaction design ‘shape[s] our everyday life through digital artefacts – for work, for play, and for entertainment’ (Crampton Smith in Moggridge, 2007). She and other scholars propose that the underlying objective of interaction design is people, their goals, and the systems developed and implemented to enable these goals to be realised (Norman, 2002; Forlizzi *et al.*, 2008; Saffer, 2010). Some of these may be realised with a computer, but interaction design is not limited to computer interaction – it is also concerned with symbolic function (Crampton Smith in Moggridge, 2007), appropriate expression (Moggridge, 1999) and the meaning of a digital artefact (Rettig in Saffer, 2010). Fallman concurs, stating:

While there is no commonly agreed definition of interaction design, its core can be found in an orientation towards shaping digital artifacts – products, services, and spaces – with particular attention paid to the qualities of the user experience ... including physical, sensual, cognitive, physical, emotional and aesthetical issues; the relationship between form, function and content; as well as fuzzy concepts such as fun and playability (Fallman, 2008, p.4).

With the exponential rise of personal computers in the 1980s and the fledgling connectivity of electronic bulletin board systems (BBSes) on the internet, as well as the subsequent emergence of the web in the 1990s, there was a sense of urgency about creating better interaction design to integrate these systems into everyday use (Norman, 2002; Forlizzi *et al.*, 2008). The literature suggests that usability is a concern of interaction design, best highlighted by Andreessen’s development of Mosaic (Saffer, 2010), which made the web accessible to anyone who had access to a modem. Features such as back buttons and the simultaneous loading of image and text were critical in transitioning the web from a specialist technical community to a consumer communication and information system (Saffer, 2010; Winograd in Moggridge, 2007).

Crampton Smith states that quality interaction design requires a considered assessment of all aspects pertaining to an interaction – that is, context and human behaviours over time – in order to design systems or objects that integrate seamlessly into our world without the user having to adjust their behaviour to technology (Crampton Smith, in Moggridge 2007). Norman’s *The Design of Everyday Things* highlights the need for better interaction design merely to simplify human activity by minimising the possibility for errors (Norman, 2002). It is apparent from the

literature that interaction designers seek to make interactions with computers more human by attempting to imbue interactions with emotional qualities and human characteristics (Alben, 1997). Methods used to assess the human needs of interactions include user profiling, the development of personas and scenarios, sketching, modelling, and developing storyboards or narratives that describe the interaction. While the literature indicates that research in this area is in its infancy, Forlizzi *et al.* (2008) predict that developing rigorous methods in these areas will help to more successfully assimilate interaction design with HCI in the future.

Significantly, there are parallels between interaction design and gaming (Polaine, 2010). Examining these links can be helpful, given the little discussion of interactivity in interaction design. Game developer and design researcher Laurel claims that games have led the way in interaction design, attributing this lead to the overarching objective of games to engage through fun (Laurel in Moggridge, 2007). On gaming, Saffer writes that it has afforded a parallel set of 'interaction design paradigms' that exist alongside traditional or professional models of the desktop. Gordon, founder of the game company Electronic Arts, says:

We asserted that interactive virtual world gaming would be a way that people could train in a bunch of different ways, socialise and get the same kind of richness that one can get in many aspects of real life, but without the risks (Gordon in Moggridge, 2007, p.325).

Moggridge (2007) believes much of the underlying philosophy of game design can be applied to interaction design, citing Wright, creator of the Sims series of games in the 1990s. Wright stresses that the longevity of games depends on their ability to capture and sustain the imagination, audience enjoyment, and the ease with which they are learnt and operated (Moggridge, 2007). More recently, Bonds (2011), a creator of alternate reality games, stated that the success of her games lay in the intersection between the game and real networks that capitalised on distributed cognition, connectivity, immediacy and community.

By examining gaming and its parallels with interaction design, a picture of interactivity emerges as a set of features in a system which facilitates the act of interaction (Boyarski, 1997). Within this framework, interactivity can be seen to occur in interactions and exchanges in everyday life (Boyarski, 1997). Alben (1997) posits that human experience is central to interaction design because it connects interactivity to reality rather than abstract or disconnected concepts. Polaine (2005) explores the experience of interactivity through its relationship to play. He argues that 'processes and languages of interactivity – the underlying structures that [encourage] interactive engagement – are under-explored and ill-defined'.

He believes the problem of defining interactivity lies in the inability to accurately measure the user's experience from an intellectual perspective. Polaine therefore explores the measurement of interactivity based on the user's physical engagement. In this way he examines the user's complete absorption in the interactive task and applies Csikszentmihalyi's flow principles to an interactive experience in which 'engagement may begin and end with playful experiences that are satisfying in their own right' (Polaine, 2005; 2010).

Polaine (2010) asserts that the common theme that emerged in his study was that play, interactivity and new technologies are significant because of their driving role in society and the profound changes they create. In this context, he perceived the primary role of 'contemporary interactives' was connecting people (Polaine, 2010), similar to Moggridge's perception of interaction design. Other interaction designers describe interaction design as the facilitation of interaction between humans through products, services, and, to a lesser extent, between humans and products that display a level of awareness (Saffer, 2010). The notion of awareness and human agents is similar to how Crawford defined interactivity – as a process of listening, thinking and speaking that could take place between humans or human agents (Crawford, 2005). Therefore, by examining interaction design and games as having similar goals, it can be said that both share a similar understanding of interactivity. From an interaction design perspective, interactivity underpins and facilitates interactions and should be considered from a social, physical and cognitive perspective. Interaction design is about meaning and expression. Scholars imply that interactivity enables users to co-construct meaning and share it through distributed networks. If interaction design is so well regarded, it is interesting that the meaning of interactivity remains implicit and rarely discussed.

The synergies between HCI and interaction design are obvious in the literature: as proponents of HCI – such as Brenda Laurel, Terry Winograd, Dan Boyarski and Don Norman – appear in literature concerning both fields of practice. While it has been argued that HCI has to change to accommodate people, the literature suggests that interaction design needs to establish research methods that are more relevant within the HCI research paradigm. What is evident are the overlaps and synergies between the two areas. Both are concerned with usability, interface, interaction, efficiency and the interrelationship between human and computer. However, interaction design is perceived as being concerned with the human side – dealing with the user's perception, circumstance, habits, needs and desires (Fulton Suri, 2005), while HCI has been depicted as being technologically oriented with a rational and scientific approach. The similarities and differences between these areas require further examination and comparison to establish whether they share any common themes within the interactivity debate.

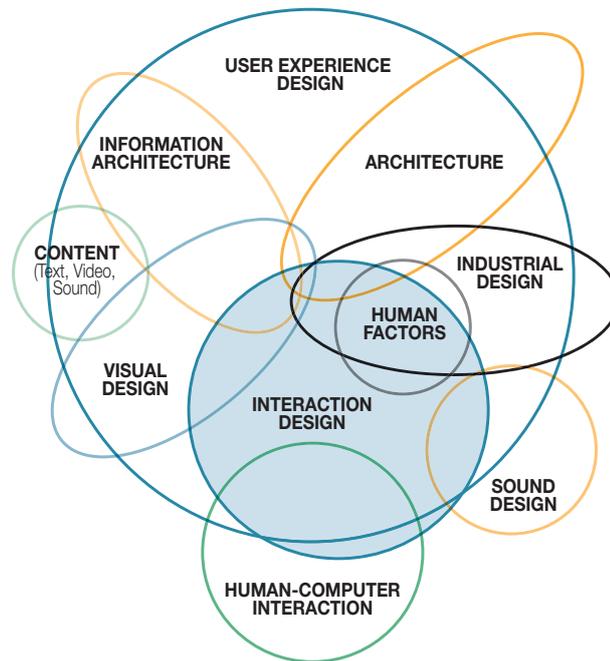
### 3.3.4 Comparisons between the three perspectives

Throughout the literature, it becomes apparent that HCI and interaction design share similar priorities and practical objectives, while communication theory focusses on the construction of theoretical paradigms occurring in these areas, based on practice. A review of the three perspectives reveals significant differences in their perceptions of the audience or user, and how these differences inform practice and theoretical paradigms. Communication theorists seek to understand the implication of interactivity on communication channels, the shifts in power relations, the impact of targeted communications, and the overall effects of these and other changes on the audience. The audience is acknowledged as changing to become active participants and producers of content. As discussed, HCI perceives the user differently, (though how differently varies between the divisions between computer-focussed and human-focussed HCI), but is generally reported as having a rational approach to the user. The literature in interaction design is concerned with people, users and human qualities, suggesting that more attention is being paid to the ephemeral qualities of interaction.

On face value, it would be easy to think of the two fields of HCI and interaction design as the same. However, further examination reveals significant differences in their approach to the user. HCI approaches the user from a scientific tradition, in which there is an expectation that users will alter their behaviour to use the technology. Interaction design considers the user from a social, emotional, physical and intellectual perspective. While some literature suggests there are overlaps between HCI and interaction design in their consideration of the user, the prevalent attitude is that HCI is technologically oriented due to its heritage in engineering and psychology, which has tradition of research that is quantitative and empirical (Downes & McMillan, 2000; Faiola, 2007; Forlizzi *et al.*, 2008). In contrast, interaction design is closely aligned to other design disciplines in which the notion of research is still in its infancy because designers have relied on intuition to inform their practice (Forlizzi *et al.*, 2008; Hanington, 2003).

Figure 3.1 is a Venn diagram taken from Dan Saffer's book, *Designing for Interaction* (2010). It visualises the various disciplines contributing to interaction design. The diagram highlights an overlap between HCI and interaction design, suggesting there are some shared ideals between the two fields. However, it is significant that interaction design has more overlapping areas with other design fields, highlighting more differences than similarities between interaction design and HCI. Some of the other design disciplines do not intersect at all with HCI, contradicting reports that HCI is design inclusive.

Figure 3.1: Saffer's definition of interaction design. Re-drawn from Saffer, 2010.



Saffer's diagram highlights that the HCI field sits outside the design paradigm. Although Figure 3.1 aims to define interaction design, it hints at the difficulty that confronts us when talking about interactivity. All the fields listed in this diagram have varying perceptions of the term and, despite the breadth of fields visualised, Polaine (2010) criticises the diagram for not including theory-based disciplines, such as communication theory and social sciences, that influence our understanding of interactivity.

In the literature on interaction design there are frequent references to the collaborations that occur between HCI and design. However, the main collaboration is between HCI and interaction design, and even here there appears to be a history of tension between the scientific drivers of HCI and the more ephemeral nature of design. Forlizzi *et al.* (2008) state that the barrier to collaboration is attributable to the lack of research traditions in design. Barnard *et al.* (2002) argue that research and theory are critical in HCI as they unite the diverse fields of thought. However, recently, Bartneck reported on the rifts within the HCI community and the call for the field to adjust its priorities and be more inclusive of human elements, such as emotion, visceral design and reflective practice (Hassenzahl, 2004; Bartneck, 2009). Significantly, these are the very elements that designers prioritise, which are also difficult to qualify or measure empirically (Lingaard & Whitfield, 2001; Saffer, 2010; Faiola, 2007; Bartneck, 2009). Therefore even though a new HCI paradigm is said to be mindful of these elements, there is still a sense that HCI is systems-driven.

Within HCI and interaction design there is not the same preoccupation with defining interactivity as there is in communication theory. Interactivity is implicit in the practice of HCI and interaction design, whereas Bucy (2004) states that communication theorists 're-invent the wheel' every time they define interactivity. Therefore, while the literature and examples on interactivity are abundant, complexity emerges because the three fields approach an understanding of it from different theoretical and practical perspectives. The emergence of the web created more complexity, creating the need to revise definitions in the context of networked computers. That said, within the diverse contexts, the literature has revealed a set of common features that characterise an interactive experience: exchange, control, communication and systems. These features will help to establish a classification system for further examination in this thesis.

### 3.3.5 Networked computing and contrasting views

Significantly, a review of HCI, communication theory and interaction design highlights the differences in their origins and, therefore, the differences in their perceptions of interactivity. Although HCI emerged in the 1980s with the rise of computing, the fields that amalgamated to form it had been working with interactive principles in the development of the mouse, GUI, hypertext, speech recognition and gesture recognition (Myers, 1998). These fields sought to improve interactions between human and computer, which had been referred to as the 'box on the table' (Card in Moggridge, 2007). While there were some networking options available via the internet with emails and BBSes, the idea of networked computers in the 1980s occurred within a specialist community.

Communication theory developed before computers, focussing on all types of distributed communications, including television, radio and newspapers, and the impact of communications and media on mass culture. The predominant flow of information was a one-to-many model, in which the audience was perceived as a passive recipient of information. With the rise of computing and new media, the concept of interactivity and what it constituted became a central focus of communication theory because it was pivotal in shifting from old media paradigms to the new. Within a new media framework, interactivity was seen as giving the user more control and choice than had been available previously.

As discussed, interaction design emerged as a term alongside the meteoric rise of computers and new media at a juncture that saw developers, such as Moggridge and Verplank (amongst others), dedicated to the design of imaginative solutions that emerged from the needs and desires of people in the digital world (Verplank in Moggridge, 2007). Within this space, Moggridge (2007) explains, interaction designers designed behaviours, animations and sounds that communicated to the

user through symbolism and emotion. The pioneers of interaction design strove to integrate digital objects with people to give 'aesthetic pleasure as well as lasting satisfaction and enjoyment' (Moggridge, 2007).

Therefore, when the web emerged, ideas and practical realisations of interactivity had been explored within the technology of the day. Themes that emerged in the early definitions of interactivity were focussed on how people interacted with computers (Winograd, 2002; Wozniak, 2012) and their perceived control. Boyarski (1997) questioned the notion of control, arguing that in most interactive software, the users' paths or choices were predetermined. While there were definitions of interactivity that referred to sequencing, control exchange and systems metaphors, with the emergence of the web into mainstream culture, the scope of research broadened.

The literature points to upheaval after the web emerged. As the web became the main form of networked computing, all of the theories and understandings of interactivity from the previous decade required revision. Networked computers ushered in a new social context in which users could interact through them (Carroll, 2002) or use them as a conduit for information exchange (Winograd, 2002). Networked computing was the catalyst for many different types of interaction that extended beyond the user-to-computer model. Weiser's (1991) early ideas of ubiquitous computing positioned computers as invisible, silent enablers that allowed users to interact within the environment (Winograd, 2002). The idea of social computing was a dramatic shift for all three fields, particularly for HCI. Carroll (2002) documents the emergence of a sub-committee for collaborative work on computers in 1986, which, in the wake of the web, developed a philosophy to support the research and development of collaborative systems. In communication theory, networked computers challenged the traditional role of the audience and the models of information flow. Communication could be sent in multiple directions, modified and resent. The impact of networks in computing seemed to have less impact on the interaction designer, given that the field emerged as a response to HCI's rationalistic focus. That said, understanding the user's behaviour, cognition and response to the web was critical, as the systems and digital objects created by interaction designers became an invisible environment for different types of communication.

### 3.3.6 Conclusion

Interactivity is understood in HCI, communications theory and interaction design from different perspectives. While there are some similarities, they approach interactive media from different starting points that are influenced by practice and research traditions. With the emergence of the web, their understanding of

interactivity shifted, challenging research paradigms and widening their scope of practice. An increased focus on the user commenced in the 1980s, leading to the development of testing methods that enabled interactive hardware and software to be evaluated with users, iteratively through the process of design. In the context of networked computers, the focus on the user or audience intensified as practitioners and researchers were required to consider social interactions and the implications for communication. The potential for communication was unprecedented, and existing knowledge was used to help make sense of the web with specific context.

## 3.4 | Towards a theory of interactivity

As discussed in the previous section, the context in which interactivity occurs has a bearing on its definition. HCI specialists perceive interactivity as a functional process that underpins a system or interface which enables users to interact with or through a computer (Hewett *et al.*, 2009; Carroll, 2002). Similarly, interaction designers perceive it as underpinning a functional system that extends beyond interaction between the human and computer to focus on the holistic experience and communication resulting from the interaction (Moggridge, 1999, 2007; Fallman, 2008). Communication theory proposes interactivity as a multifaceted concept, with multiple roles, and focusses on explaining the concept within a communication framework.

Despite the complexity of defining interactivity, the literature reveals a set of defining characteristics that are common across the three fields:

- Exchange
- Control
- Communication
- Systems.

This section explores these characteristics across HCI, communication theory and interaction design in order to move towards a theory of interactivity that can be used to explore communication designers' perception of the term.

### 3.4.1 Features of interactivity

Simply put, interactivity has been documented as a process of information exchange that can take place between people, people and computers, and people and digital objects. A critical element of exchange is time, as exchange in interactive environments occurs either synchronously or asynchronously (Crawford, 2005; Kirsh, 1997; Stromer-Galley, 2004). Much of the early practice and literature involving BBSes and discussion forums on the internet suggested that interactivity

facilitated the exchange of messages. In early definitions predating the web, Rafaeli (1988) observed that a key component of interactivity was reflected in a sequence of emails and the capacity for users to refer to earlier messages, similar to a face-to-face conversation. Rice and Williams (1984) described how interactivity was characterised by information exchange amongst participants in an interactive environment. A subset of the literature refers to the interchangeable nature of roles in an interactive exchange, in which senders become receivers and vice versa (Bretz, 1982; Rice, 1984). Exchange underpins McMillan and Downes's (2000) discussion of the reciprocity of interactivity. Similarly, it is core to Ha and James's (1998) definition, in which they focussed on the responsiveness of the communicator and audience to each other's communication needs.

This characteristic is not new. Exchange lay at the heart of the Memex (Bush, 1945) and hypertext (Nielson, 1995), which Berners-Lee adopted as the protocol for the web. While the web has evolved exponentially, so too have the types of exchange that interactivity facilitates, such as global networks, co-creation, remediation, collaboration, produsage and information sharing. A key point to highlight, however, is that interactivity itself is not exchange. Rather, interactivity facilitates a process of exchange. As such, exchange has become a defining characteristic of an interactive environment.

Another distinguishing feature of the interactive environment is user control. Control has been formally associated with interactivity since the 1980s, when it was defined as a 'style of control' (Guedj *et al.*, 1980). In the literature on interactivity on the web, control and choice are connected and are associated with empowering the user. Early literature states that users were able to exercise control to express themselves (Bezjian-Avery *et al.*, 1998; Jensen, 1999, Coyle & Thorson, 2001), co-create meaning and influence the content and distribution of communications (Jensen, 1999). Increases in connectivity between networked devices enabled users to choose what information they gathered and how they received it.

Throughout the first decade of the web, scholars focussed on the user and the facilities that allowed them to exert their influence on the media (Jensen, 1998; Lombard & Snyder-Dutch, 2001; McMillan & Hwang, 2002; McMillan, 2006; Flew, 2008). Discussions of control overlapped with discussions of exchange, as perceptions of control were said to impact on users' level of engagement (Rafaeli, 1988; Williams *et al.*, 1988; Murray, 1997; Lieb, 1998; McMillan, 2006). Because control is perceptual, it has been questioned whether it is real or predetermined (Boyarski, 1997; McMillan, 2006). The problem with control is that it is largely based on the perception of the user and the degree to which they control more or less of the environment taken to be interactive (Stromer-Galley & Foot, 2002;

Sundar *et al.*, 2003). Given the plethora of definitions stating that control is a trait of interactivity, it is significant that types of control are variable and hinge on the perception of the user. Therefore, similar to exchange, control is a defining characteristic of interactivity, but interactivity itself is not control. Interactive functionality has been used in web design to create a system where the user is empowered to operationalise and exert different types of control within an interactive environment.

Much of the literature suggests that interactive functionality equips the user with the tools required to determine their progression through a website and act on individual choices. Steuer (1992) defined interactivity as the 'extent to which users can participate in modifying the form and content of a mediated environment in real time'. Bezjian-Avery *et al.*, (1998) stated that 'in interactive systems, a customer controls the content of the interaction', whilst Lomabard and Synder-Dutch (2001) defined 'interactivity as a characteristic of a medium in which the user can influence the form and/or content of the mediated presentation or experience.' While control has negative connotations, within the discussion of interactivity it is perceived as liberating and empowering for the user.

Communication is a key characteristic of interactivity. As discussed earlier, there is a vast body of research that explores the impact on communication in an interactive paradigm. Initially, the idea of face-to-face conversation (Rafaelli, 1988) prompted much of the original research into the communication attribute of interactivity. However, in later literature scholars refer to communication between agents who may or may not be human, thus broadening the types of communication associated with interactivity. There is a suggestion that interaction and communication are similar entities (Hirokawa in McMillan, 2006), and that symbolic communication can be achieved through interactions (Moggridge, 1999; Saffer, 2010; Crampton Smith in Moggridge, 2007). What is also evident in the literature is that the characteristics of interactivity overlap. Therefore, exchange and control are deeply connected to communication, and can impact on the level of engagement in any communication (McMillan & Hwang, 2002).

McMillan (2006) and Jensen (2008) developed typologies that examined the exchange and control of information in new media and the web, and associated power relations. Evident in both typologies was the shifting role of the user in a dialogue as well as in the generation and distribution of content. McMillan brought together models of interactivity from three different research traditions: user-to-user, user-to-document and user-to-system, and explored the types of dialogue in each. Although the aspect of power relations falls outside the scope of this thesis, the identification of types of dialogue in interactive environments – feedback,

monologue, responsive dialogue and mutual discourse – was important in the development of the protocol tool, as will be discussed in Chapter 4. Similarly, the concept of interactivity devised by Jensen (2008) addresses the power relationships associated with communication. His categorisation of interactivity – transmissional interactivity, conversational interactivity, consultational interactivity and registrational interactivity – alongside other elements, such as passive and active users, media types, co-creation, time and space, provided a preliminary classification method for website analysis, which is discussed further in Chapter 4.

While communication is a common characteristic within interactivity, different ways of understanding this form of exchange emerge. HCI focussed on communication between human and machine, but while interaction design has similar concerns, it also seeks to understand communication through object and function. Communication theory addresses the breadth of communication types and the implications. Therefore, while the classifications of communication are an attempt to advance knowledge and research in particular areas, each of the three areas address the communication characteristics that interactivity facilitates with different objectives in mind.

Behind the characteristics of interactivity are interactive systems that facilitate the characteristics. Within the HCI community there is extensive discussion of hypertext, code and scripting languages, computations, gesture and speech recognition, usability and user-centred design (Buxton, 2007; Hewett *et al.*, 2009), which all have a systematic approach. Interestingly, Moggridge (2007) discusses Card's role in computer development as designing systems that evaluated users' perception iteratively. Saffer (2010) discusses inventions, such as the telephone, and the critical systems that were established to enable communication to occur. For interaction designers, a systematic approach is critical for achieving a positive experience (Moggridge, 2007; Buxton, 2007; Saffer, 2010). Within communication theory the discussion of interactive systems is often understated, yet always implicit. In subsets of the literature, scholars have focussed on the systems or processes of interactivity (McMillan & Hwang, 2002; Jensen, 2008). As mentioned, Jensen's concept of interactivity positions four modes of interactivity within a framework that describes a system of information distribution (Jensen, 2008). Stromer-Galley defined interactivity as a process as well as a product (Stromer-Galley, 2004). McMillan and Hwang developed a taxonomy of definitions pertaining to interactivity as a process, with features and perceptions. Within both the process and feature category, underpinning the definitions were systems that enabled two-way communication, choice, responsiveness, exchange, user control, real time and participation (McMillan & Hwang, 2002).

Despite the research undertaken in developing taxonomies for interactivity, Bucy (2004) asserts that typologies lack conceptual clarity and are isolated from a social

system or context. For this reason he argues that most typologies and definitions of interactivity are complex and difficult to operationalise. Bucy (2004) argues that until the phenomenon of interactivity is explored within a social system, an overall theory of interactivity is yet to be developed, because scholars are continually re-examining existing definitions and recreating meanings to suit their own context and intellectual disposition. That said, there are patterns that emerge throughout the literature that define attributes of interactivity across HCI, interaction design and communication theory: exchange (Rafaeli, 1988; Carey, 1989; Ha & James, 1998; Bezjian-Avery *et al.*, 1998), control and choice (Jensen, 1998, 2008; McMillan, 2000; Lombard & Snyder-Dutch, 2001; Schumann *et al.*, 2001; Coyle & Thorson, 2001), systems to facilitate communication, and systems that facilitate other characteristics (Carey, 1989; Cho & Leckenby, 1999; Pavlik, 1998; Ha & James, 1998; Ahren *et al.*, 2000; McMillan, 2006). Throughout the literature these attributes have remained constant amongst rapidly changing technology. While communication and interaction were seen as interlinked, the emergence of the web, underpinned by interactive protocols, was immediately perceived as affording new types of communication. Two decades on, the potential of the web and the best ways in which interactivity may facilitate communication is evolving and still being explored. By focussing on the characteristics of an environment taken to be interactive, it is hoped to move towards a general understanding of interactivity within a web context for further exploration in this study.

Over the past two decades, various definitions and typologies have been developed to construct a theory of interactivity. However Bucy (2004) argues that there is still a fundamental problem which requires attention. He believes there is a need to delimit the definition of interactivity, to separate the concept from ongoing technological change and initiate a discussion that addresses interactivity within a social framework. Discussions in the literature are complex because of the interrelationships between the characteristics of interactivity. For instance, control is said to impact the levels of engagement (McMillan & Hwang, 2002), while time and choice impact on a user's sense of control, subsequently affecting communication (Novak *et al.*, 2000). Time and control can impact on the quality of an interaction and affect participation in communication (Crawford, 2005). Bucy suggests there should be a simple definition of interactivity, devoid of overlapping domains and complex relationships. He believes interactivity should be described as 'reciprocal communication exchanges that involve some form of media, or information and communication technology' (Bucy, 2004).

This definition describes the features of interactivity outlined in this section – exchange, control, systems and communication – but fails to acknowledge the perceptual and emotive qualities that interactivity facilitates, or the characteristics that make the web powerful and engaging (Herigstad, 2012). For the purpose of

this study, the working definition of interactivity will recognise it as facilitating a functional system of communication while acknowledging that it also contributes to the emotional qualities of a web experience.

### 3.4.2 The web and practices of interactivity

The past decade has seen rapid advances in the ways in which internet technologies support interactivity in web design. The development of authoring tools, such as Dreamweaver and Flash, has made extensive, high-end web design more easily achievable by professional designers. As the web has become a richer design environment and interactivity a more familiar concept, more traditional communication design studios have included web design in their design portfolio. With the introduction of broadband and its faster download and response times, different kinds of interactivity have become possible. These developments have widened the scope of what the web can do and be made to do. Yet, for all the technical advances that make good design for the web easier to achieve, it is surprising that there has been little scholarly contribution from communication designers as to how they perceive and utilise interactivity in order to achieve good design, both on an aesthetic and a functional level. Had they done so, it would have positioned them as actively engaged in the collaborative relationships that have advanced the web and contributed to its understanding. Interaction designer Luke Wroblewski (Saffer, 2010) states that visual design is ‘the voice of interaction design and information architecture, [where] it communicates the importance of (and actions between) the content and actions within an application’.

Literature is beginning to emerge that discusses the interdisciplinary fields involved in developing user experience design. Within these collaborations, communication designers are more evident in the research (Shedroff, 1994; Buxton, 2007; Moggridge, 2007; Saffer; 2010). Until recently, much of the writing that looks at the intersection between communication design, interactivity and the web has been from the popular and trade press, mostly in the form of monologues, how-to books and blog spaces dedicated to a range of design commentary, criticism, designers’ thoughts and tips on writing code. There was an initial flurry of discussion from design commentators in the late 1990s and early 2000s about screen space and the utopian future of communication design (Julier, 2000; Helfand, 2001). Lupton (2006) explored the birth of the user from an HCI perspective and its influence on both screen and digital media. Helfand examined the infinite possibilities of screen space in *Screen: Essays on Graphic Design, New Media and Visual Culture* (Helfand, 2001). Scholars and academics have examined the omission of aesthetics within web design (Engholm, 2002; Haig, 2002) observing that very few attempts had been made to develop analytic and reflective approaches that enable any analysis of the web as an aesthetic phenomenon. Buchanan asserted that good design for the web included a combination of desirability, usability and usefulness

(Buchanan, 2000) and design historian Julier stated, 'interactivity involves a dialogue of control and feedback between a user and a program. It means that the user is able to intervene in the representation itself' (Julier, 2000).

Significantly, the rapid evolution of the web has rendered the contributions from design in the 1990s irrelevant in the current context. How-to books, such as Siegel's (1996) and DiNucci *et al's.*, (1998) are outdated because technological improvements have changed the conditions in which workarounds were initially developed. In light of technological improvements, the contentious debate between Nielson and Siegel has become symptomatic of the time, representing how different fields approached the web and its limitations. While the constraints have lessened over time, Nielson still advocates usability as a priority, even though he claims usability issues have reduced due to enhanced technology, better design, familiarity and user adaptation (Nielson & Loranger, 2006). He asserts that better design is variable and is subject to change. Because of the lack of clarity around what communication designers actually do, there is still confusion as to their role in design for the web (Naughton in Montgomery, 2012). This thesis is critical in contributing to a clearer understanding of a communication design approach towards understanding and implementing interactivity in web design. Insights into design knowledge and practice will complement the existing body of knowledge surrounding interactivity and the web. It will highlight the practical contribution that communication designers have made – a contribution that is just as valid as the theoretical constructs and models of interactivity discussed since the 1980s.

### 3.5 | Conclusion

Defining interactivity has been a vexed issue. Different domains have different understandings of the term, based on the origin of the field and how their understanding and approach to interactivity emerged. Interactivity can be considered as a high-level philosophical concept or, from a practical perspective. Despite the different starting points, there are similarities linking some perceptions and definitions. Much of the confusion surrounding interactivity has been linked to the ongoing reinvention of meaning. However, the main differences lie in the approach to the user or new audience. While HCI and interaction design are practical endeavours, communication theory focusses on the implication of practices in these fields from a communication point of view. As such, communication theorists focus on information flow, narrative structures, power relations, community, cyber citizenship and the role of the audience in order to construct frameworks in which to better understand the communication implications of interactivity and the web. Based on the literature, there is a gap between theory and practice, and this gap should be explored in order to learn more about the importance of context in determining what interactivity is.

Throughout the discussion of interactivity, common characteristics have emerged, demonstrating that there are some shared ideals pertaining to the term despite the apparent lack of consensus in the literature. The scholarly arguments are objective, discussing interactivity in a way that is logical and measurable, devoid of the emotional attributes of an interactive environment. From this perspective, interactivity can be measured and its effects quantified. Within interaction design, however, there is discussion of human qualities that are less easily measured. Attributes such as playfulness, responsiveness, efficiency and intuitiveness are reported to be compelling, critical components of designing interactive experiences on the web, yet they are difficult to validate.

The other gap in the literature relates to communication design. Significantly, there is very little contribution from communication design practitioners, scholars and academics as to what constitutes interactivity and its impact on the practice of communication design. This is significant, particularly in the current climate in which HCI has been criticised for its exclusion of design disciplines other than an engineering perception of design (Forlizzi *et al.*, 2008; Bartneck, 2009). Also lacking is any real discussion surrounding aesthetics and the value of design on the web. While graphic designers have been acknowledged for their work in developing GUIs and being the voice of interaction design, there is very little discussion of web design outside the commercial boundaries that communication designers operate within.

Summing up, the literature reveals a gap in scholarly contributions from communication design, which is a practice-based profession working with interactivity and the web on a daily basis. Definitions of interactivity mainly emerge from designers working within the areas of interaction and experience design. While their understanding of interactivity could be said to encompass all design, it is not specific to communication design. The literature highlights that there have been few studies into how communication designers perceive interactivity. The literature highlights that the role of the designer is to solve problems, devising ways of changing existing situations into preferred ones. If we look at the definition of interactivity as a problem that has eluded scholars for the past decade, and created barriers that have prevented communication design from collaborating with HCI, then this study is positioned to resolve and make sense of the term from a communication design perspective. Therefore, to understand interactivity from a design perspective, it is necessary to go deep into creative practice in order to understand the designers' perception of interactivity as it is both articulated and visualised. 'Understanding interactivity can help practitioners create environments that facilitate interaction' (McMillan, 2006), and a comprehensive understanding can make better use of the capacity of interactivity to aid communication.

# 4 | Research Methods

## 4.1 Introduction

This thesis aims to access the inner thoughts and practice of designers in order to understand their perceptions and use of interactivity. The challenge is to design a research framework that allows this to occur. Knowing that designers use visual language to communicate their ideas, an important consideration in this study is the collection of different types of data, both oral and visual, which are required to gain deep insight into these inner thoughts and practices. By analysing this data, I will attempt to answer the following questions:

1. What does interactivity mean for designers within the everyday practice of web design?
  - How does the knowledge of communication design influence the emergent practice of web design with respect to interactivity?
  - Have communication designers developed new knowledge from their work in web design?
  - How do communication designers frame the user within the interactive environment of web design and how do they respond to this in their design practice?
2. Interactivity was a significant term in the 1990s. What is the relationship between what theorists said then and what designers now do?

This study uses interviews, diagrams and websites within a grounded theory framework that will yield information that has qualitative value. Grounded theory provides a holistic background from which data can be collected and, through an iterative process of analysis and evaluation, the hypotheses emerge. As an overarching framework it bears a strong resemblance to the dynamics of a design process. As a designer, this framework was intuitive for me and was an obvious approach to analysis for this study.

When reviewing the types of research approaches currently used in design research, there were very few suitable for this study. Frayling (1993) attempted to define the types of research conducted in design as:

- Research into design, which includes historical and aesthetic studies of art and design
- Research through design, which is predominantly project-based
- Research for design, the purpose of which is to create artefacts or systems that communicate the research results and the validity of the study.

Since then more types of research methods appropriate for design, have emerged yet despite the growing body of literature in design research, it is still considered to be in its infancy and without traditions (Hanington, 2003; Lunenfeld, 2003; Saffer, 2010). Design is a complicated social process, and given that design research has emphasised the graphic object, the impact of it, or the process leading to it, and has not focussed on the designer or their perceptions, this study has had to adopt methods conducted by scholars who study people.

Australia provides a rich context in which to carry out this type of research. Communication design in Australia has emerged differently when compared with the US and Europe. Due to its small population, designers, dating back to the goldfields, have had to be flexible and adaptable across diverse media (Caban, 1983). Within Australia, the emergence of new media and the web has seen new design genres evolve, and a resultant shift in nomenclature to acknowledge these changes. Within these areas there is overlapping and specialist knowledge. Due to the lack of clarity regarding the priorities of each area of design, there is a need to reflect upon what is now considered communication design and how interactivity intersects with this profession. I will now lay out in detail the methods used in this study and the reasons for their use, including the underlying research philosophy of grounded theory, designing methods to implement a grounded theory approach, and reviewing the chosen methods. This chapter will also discuss the processes of data collection and analysis, as well as reviewing any perceived limitations to the methods in the study.

## 4.2 | Research philosophies

Unlike most research undertaken in design, this study concentrates on designers, their thoughts and their actions. When examining current design research, it became apparent that many of the methods used in design research focussed on what designers do (or the designed objects) and were therefore of little use to this study. Nevertheless, the literature in design research did highlight the advantages of using qualitative methods, which generate rich contextual and detailed data (Steckler *et al.*, 1992). These qualitative methods were concerned with individuals' attitudes, beliefs, views, context and feelings (Hakim, 1987), compared with quantitative methods that were a means for testing objective theories, but which provided scant

insight into the perspectives of the participants. A qualitative research framework allows for the collection of a variety of data, such as words, images and narratives, affording different viewpoints on the same question (Hesse-Biber, 2010). Just as much of the literature on design research discusses how design co-opts methods from other disciplines, such as psychology, anthropology, humanities and the social sciences (Hanington, 2003), it was necessary in this study to borrow research methods from other disciplines such as the social sciences in order to develop an appropriate research framework that would generate considered answers to the questions asked. This section therefore examines the underlying research philosophy of this thesis, qualitative versus quantitative methods, and grounded theory as an approach that guided the data collection and analysis process.

#### 4.2.1 Qualitative versus quantitative methods

Bryman (2008) has discussed the compatibility of quantitative and qualitative research methods in social science. While he says the distinction is ambiguous, he notes how some social science researchers see them in stark contrast to each other, while others believe the difference is of no consequence. Despite this ambiguity, I will discuss the differences between these methods and the reasons that led to the choice of qualitative over quantitative research.

Quantitative research was the predominant method in social research until the 1970s, when qualitative methods began to gain recognition and influence (Bryman, 2008; Wheeldon & Åhlberg, 2012). Quantitative research is understood as the collection, analysis, and interpretation of data that can be quantified. It is a deductive approach to analysis, meaning that quantitative research begins with a hypothesis or theory that is tested and either accepted or rejected as a result of the testing process. It is reported as objective and is based on existing norms and assumptions (Bryman, 2008). Qualitative research, on the other hand, is inductive, involving theories emerging from the data gathered. This type of research builds theories through highly focussed in-depth analysis that considers context, relationships and observations. In qualitative methods data is all-important, and researchers gather it through interviews, surveys, observations and other ethnographic methods. Simply put, quantitative research presents objective numerical information, and qualitative research presents information as a narrative.

While quantitative methods have been said to be reliable and credible, some sections of the social science community criticise this approach due to its perceived rigidity and limitations in gaining insight from the participants. While there is a perceived difference in the social sciences between positivists who use quantitative methods and interpretivists, who deploy qualitative methods, the division between the two areas is lessening due to a growing emphasis on using appropriate methods rather than a strict

adherence to either quantitative or qualitative methods. Mixed methods combine both quantitative and qualitative methods, and their use has increased steadily in recent times (Hesse-Biber, 2010). Creswell and Plano Clark (2007) state that mixed methods provide a more complete picture by noting trends and generalisations as well as yielding in-depth knowledge of participants' perspectives. They argue that both approaches, in tandem, enhance the strength of a study. Hesse-Biber (2010) suggests that the use of mixed methods has accelerated, due in part to the increase of books on the subject, the rise of computer-assisted qualitative data analysis software tools, as well as external pressures from government and business to examine social policy via a range of methods.

At the heart of the mixed methods approach is triangulation. Jick (1979) argues that triangulation is central to this approach's use and validity, rendering a study more accurate and enhanced by the provision of multiple viewpoints. Triangulation facilitates the validation of data through cross-verification from more than two methods (Bryman, 2008). It can be used in both qualitative and quantitative studies, with the purpose of finding the same results through different methods (Wheeldon & Åhlberg, 2012). By using more than one method, one can overcome any biases or weaknesses that arise from single-method, single-observer or single-theory studies (Bryman, 2008). Hesse-Biber (2010) suggests that triangulation 'fortifies a study's conclusion' and is acceptable to proponents of both qualitative and quantitative methods.

Despite the appeal of mixed methods and methodological triangulation, the aim of this study was to understand designers' perceptions and how these influenced their design for the web. As such, I was interested in the background, relationships and context surrounding interactivity and the exploration of the differences between the designers. For this reason I decided not to use a mixed method approach. This study will therefore use qualitative methods to gather data in order to understand the designers' perceptions and employment of interactivity within web design. Having explored the suitability of qualitative methods as an appropriate tool to gather data for this study, this discussion will now turn its focus to the choice of a suitable framework for collecting and analysing the data. I will begin by exploring a grounded theory approach and its applicability to this thesis.

#### **4.2.2 A grounded theory approach**

Grounded theory, pioneered by Glaser and Strauss in the 1960s, is reported to be one of the most widely used and comprehensive approaches to qualitative research (Haig, 1995; Bryant & Charmaz, 2007; Wheeldon & Åhlberg, 2012). Bryman (2008) explains grounded theory as 'an approach to qualitative data that aims to generate theory out of research data by achieving a close fit between the two'. Bryant and Charmaz (2006) argue that the iterative process of grounded theory helps develop a highly

focused analysis in which data collection and analysis occur simultaneously. Through a systematic process of inquiry, researchers question 'what is happening' in the data, what is being told, its background and context, and examine the information that the data relates to (Glaser, 2002; Charmaz, 2008; Borgatti, 2006). Therefore, the primary focus is understanding the conditions in which actions (and the consequences of those actions) occur from a human perspective (Corbin & Strauss, 1990; Haig, 1995). Grounded theory can have multiple stages of data collection and analysis, based on the Glaser dictum, 'all is data ... whatever the source' (Glaser, 2002). Theories emerge and are gradually refined and corrected through concurrent analysis and comparison of the data, which, Creswell observes, distinguishes grounded theory from other research approaches (Creswell, 2009).

Developed in the 1960s, grounded theory was created as a response to then-predominant quantitative methods. Grounded theory provided an alternate epistemology using inductive methods<sup>1</sup> that were considered scientifically rigorous. In other words, grounded theory enabled researchers to approach their study without a specific research question. Instead, through broad research they were gradually able to refine the specific details of the study. Glaser and Strauss deemed this theory to be as scientific in its approach as qualitative research, whose theoretical underpinnings were derived from pragmatism<sup>2</sup> (Dewey, 1929; Haig, 1995) and symbolic interactionism<sup>3</sup>. While antagonists, such as Gallie (1956), labelled grounded theory as a contested concept, scholars have argued in favour of the validity of an inductive and positivist<sup>4</sup> approach. For Glaser and Strauss, it was important that grounded theory meet the accepted canons of undertaking good scientific method – that is consistency, reproducibility and the ability to be validated (Haig, 1995). Therefore, while grounded theory is an approach used in conjunction with qualitative data, Glaser and Strauss do not rule out empirical methods that could consist of qualitative or quantitative methods (Wheeldon & Åhlberg, 2012).

The introduction of grounded theory has provided the basis for much discussion over the past 40 years as scholars debate its inductive methods. Interestingly, since grounded theory's initial inception, Glaser and Strauss have moved in different directions, both modifying their perspectives and their employment of grounded theory,

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1 Inductive methods are an approach to research where theories are generated from research (Bryman, 2008).

2 Pragmatism is a philosophical tradition that focusses on linking practice and theory. The process builds theory from practice and then reapplies theory back into practice.

3 Symbolic interactionism is a theoretical perspective that focusses on meanings associated with actions and things in a social interaction (Bryman, 2008).

4 The positivist approach refers to the application of methods used in the natural sciences to study social reality.

highlighting its flexibility as a theoretical framework that can be adapted based on the needs of the researcher. More recently, Bryant and Charmaz (2007) discuss the ways in which researchers and scholars have adapted the original grounded theory into a set of practices and guidelines that can be modified for specific studies. Charmaz (2008) discusses constructivist grounded theory, which involves participants and researchers co-constructing meaning, and its associated issues, including the impact of the researcher and biases that can arise. Glaser argues vehemently that grounded theory is not constructivist, stating that the constant comparison and generation of categories corrects any researcher impact or interpretation (Glaser, 2002). Bryant and Charmaz (2007) also describe grounded theory as a set of guidelines, which Urquhart (2007) argues is problematic and constraining (Urquhart, 2007). Despite the acceptance of grounded theory as a rigorous research method, aspects of it remain contested. Within design, it is interesting that grounded theory is not an established research method, since its processes and procedures align closely with the way design is practiced, working simultaneously to identify and resolve design problems.

Methods referred to in the grounded theory literature speak of interviews and field notes. Borgatti (2006) refers to a 'corpus of data' that can include textual data, observations of behaviours, events, and interactions that are noted down as field notes (similar to diary entries). The primary methods involved in grounded theory are semi-structured interviews, in which analysis commences immediately as a way of adjusting and directing the next interview, so that no salient data is omitted (Corbin & Strauss, 1990). As discussed in Chapter Two, designers generate and communicate meaning in an iterative visual process, coined as 'graphic ideation' and 'graphic communication'. McKim (1980) explains graphic ideation as 'visually talking to oneself' and graphic communication as 'visually talking to others'. Brian Lawson (2006) writes that designers use visual language to articulate questions and answers throughout the design process, citing Donald Schon's (1983) description of the designer as 'having a conversation with the drawing'. Therefore, collecting diagrams visualised by the designers during the interviews became another conversation and in keeping with grounded theory philosophy. Using a grounded theory approach enables a comparison between the two kinds of conversations.

### 4.3 | Research design

Very little design research has been undertaken that reviews designers' perceptions. From the outset of this study, it was apparent that rapid technological advances left little time for designers to reflect on changes and their influence on practice, context and the design of information. The following section describes my research design and explains my motivations – what I did and to whom, where and when it took place, and

the development of specific methods in order to accomplish this. I approached this study with no pre-existing theory, or expectations as to what I would find. As discussed, the choice of qualitative methods in conjunction with a grounded theory philosophy enabled themes and theories to emerge directly from the data.

In my position as both a designer and design educator, I have been committed to advancing communication design as a profession that is articulated without ambiguity. Chapter Two demonstrates the lack of cohesion in describing design, which is not limited to Australia. Within Australia, however, designers have been criticised for their lack of clarity. 'Designers' self-descriptions become instantly meaningless', states De Vries (2010), suggesting further:

The way we use words is crucial. It is ultimately up to us to define, not just in visual language, but in written language, why people should spend money with us, why we can improve their world, why our process and combinations of left and right-brained faculty means the world should be beating a path to our door (De Vries, 2010, p.35).

Designers have also been criticised over their preference for looking at pictures rather than reading (Clark, 2005). Design activities within communication design have been misunderstood as decoration or eye-candy (Forlizzi *et al.*, 2008; Blevis *et al.*, 2006) or as 'ruining the web' (McNaughton in Montgomery, 2012). To this end, De Vries is correct that designers need to explain the function and value of design. To make progress in the field possible, communication designers need to develop a cohesive explanation of the purpose of their practice as well as the subtle nuances between highly specialised fields within communication design, so that it is understood outside the design community.

Lack of clarity has been further exacerbated in Australia by a historical legacy that saw where designers as a 'jack of all trades' (Caban, 1983), giving rise to the belief that all design is the same, whether it be advertising, graphic design, information design, publication design and so on. Having worked with web design, I was particularly interested in whether designers in this area still considered themselves generalist designers or whether the web had been the catalyst for Australian designers to specialise. By looking at such a broad question (that is, how designers perceive interactivity), I hope to gain additional information that may illuminate perceived changes to practice, any shifts in context, and changed conditions for design thinking.

Despite the lack of cohesion of nomenclature, in Australia there is an increasing recognition of effective design as adding economic value to productivity and contributing to the wealth of the nation. Government initiatives such as design integration programs (DIP) seek to embed the value of design into businesses holistically, rather than on a project-by-project basis. The intention of these types of initiatives is to increase the commercial value of products developed

through strategic collaborations, and to increase the professional standing of design. Within the literature discussed in Chapters Two and Three, we have already seen how a lack of articulation and research tradition has created barriers and marginalised communication design in HCI collaborations. Due to this generalist approach to design, Australia is ripe for a study such as this.

To explore the perceptions and actualisations of Australian designers, the primary method would therefore need to be qualitative, as it allows for an in-depth level of inquiry that is not possible using quantitative methods. Within design research, there is an increasing use of modified ethnographic methods, such as passive and participant observation – that is, half-day sessions in which the researcher observes professional people in their working community (Hanington, 2003, 2007; Ireland, 2003; Plowman 2003). However, ethnography was not appropriate for this study, as I wanted to focus on a very specific area of interest, rather than making general observations (Bryman, 2008; Plowman, 2003). Within the scope of this study, it was not appropriate to undertake participant observation methods, as many of the studios were small (two or three people) and I felt my presence would impinge upon the designers' usual practice. For a similar reason, methods involving videotaping, photography and more general observations were also discarded as being unnecessarily intrusive and non-specific. Based on my twenty-two years of working as a designer, I believed that I had enough of an insider's view to understand the approaches of designers as well as the pressures and challenges that influence their behaviours and function within their studios. As a result, I chose methods that would take up less of the designers' time and focus on their perceptions and implementation of interactivity, rather than day-to-day actions. Based on the literature review and my own experience, I understand the visual nature of the design process and believe that data regarding designers' thoughts and actions would be best revealed in methods that required them to verbalise and visualise their thoughts as well as reviewing the graphic artefact in some way.

A small sample of designers was chosen because it allowed for a focussed and in-depth study of the conversations. Using a large sample would have given the study breadth, but may have hindered the depth of examination. To counter any criticisms about the sample size, I chose designers who brought a range of communication design specialisms to the web domain:

- Advertising
- Graphic design
- Brand identity design
- Publication design
- Design education
- Game design
- Design strategy
- Information design.

### 4.3.1 Interviews

Due to the nature of this study, interviews were the preferred method for eliciting information from designers. After reviewing literature on interviews, semi-structured interviews were deemed the most appropriate method. I was interested in recursive interviewing, as it allowed for interviews to follow a conversational format based on the unique responses from the participants (Minichiello, 1995). On further investigation, the openness of this model, in which each interaction or remark determined the next one, was similar to an emotionalist approach in the social sciences, in which researchers, concerned with the authenticity of a subjective experience, gather information using unstructured, open-ended interviews (Silverman, 2006) in which emotion is central to the experience. Understanding designers' predilection for lateral thought, I believed the interviews required some structure to maintain a flowing and relevant conversation.

Using a semi-structured interview enabled the designers to construct their perception of interactivity over the duration of the interview. Semi-structured interviews allow the clarification of questions, an element that is lacking in surveys or questionnaires. If the participant does not understand the text, they cannot answer the question, whereas a semi-structured interview allows for return questions. The individual experience of the participants was key to understanding the complexity they associated with interactivity. The interview instrument established a dialogue with which I could prompt the participants to elaborate on their answers. Using a funnelling technique, I structured the interviews to commence with broad demographic questions, then shift to more specific ones. By doing this, I hoped to establish a rapport with the designers, ensuring that conversation would elicit in-depth and authentic answers. While it could be argued that funnelling is directive and contradictory to the flexibility of semi-structured interviews, the interview schedule was developed as a guide only, and the order of questions could be altered if necessary (Bryman, 2008). The nature of open-ended questions with prompts that could be adjusted would encourage a diverse response.

Czaja and Blair (1996) discuss a number of disadvantages of the interview process, including cost, time and the constraints of asking personal or threatening questions that are less likely to be answered. Cost and time were not an issue in the present study. Personal questions were broad, relating to general demographics (e.g., general qualifications, age categories and years of computer use). When designing the interviews it was intended that none of the questions be threatening or too personal. Another criticism of interviews has been levelled at the analysis process, in which researchers have treated the interview as a true account of reality without considering the context and the multiple perspectives of the participant (Silverman, 2006) or 'the events and interpersonal relations out of which [they] arise' (Whyte, 1980). Whyte observes that all people hold varying and,

at times, conflicting sentiments. This point is particularly relevant, as designers are known to view things from multiple perspectives that are not necessarily their own. Designers also use images to articulate ideas (Harper, 2002), therefore I thought it was necessary to include another method, which allowed designers to express themselves visually. The interviews provided one type of conversation and the inclusion of the diagrams provided another. While the inclusion of a visual component appeared simple, Crilly *et al.* (2006) and Shedroff (2007) suggest that careful planning is required when including visualisation in the interview process, and this aspect will be examined below.

### 4.3.2 Diagrams

There has been much debate over the validity and types of visual research available to researchers. Fyfe and Law (1988) reason that sociology has never had an agreed set of 'methods for identifying, discriminating and counting' visual research, and as such using visual methods can be viewed as lacking rigour and credibility. Other scholars believe that the marginalisation of visual methods in the social sciences is due to the way that findings are usually reported in text or orally (Chaplin, 1994). In relation to visual data, scholars raise concerns that visual data requires words to explain its context and, as such, visualisations are perceived as lacking autonomy, with no standard protocol for visual data analysis. As discussed above, much of the analysis of visual material in the past has been conducted using qualitative methods, without any standardised vocabulary or classification systems.

While there is a wide range of visual material that can be used to obtain data, photographic images have been seen as the main method by which visual data can be collected (Harper, 2002). Emmison and Smith (2000) suggest that while visual research has been conducted within the framework of traditional research for a long time, it has tended to be overlooked as a legitimate method. They believe part of the problem has been that photography has overshadowed the other forms of collection of visual data. Within the context of two-dimensional images, advertising, diagrams and drawings are in the same category as photographs, however, photographs have the potential to capture reality. Barthes (1977) believed that photographic realism offered 'windows on the world'. Emmison and Smith (2000) counter this view by arguing that photographs can be staged, in much the same way as advertising represents social construction rather than a true account of reality or behaviours (Alexander, 1994). They believe the obsession with the photograph as a primary method of visual research has, in fact, been detrimental to the overall recognition of visual data collection.

Alexander (1994), Millum (1975), Graham (1977), Robinson, (1976) and Richardson and Kroeber (1940) are all case studies cited by Emmison and Smith (2000), in which researchers analysed images using quantitative methods. It is these studies, amongst others, that are said to have promoted visual research as a valid research method.

However, there are complexities in visual analysis – there are multiple layers of interpretation in images that can differ based on a researcher’s perspective. For example, Saussure’s semiology focusses on the social function of the image or sign, Peirce’s semiotics addresses the logical function of the image (Guiraud, 1975), and Barthes examines signifiers, layers of denotation and connotation (van Leeuwen & Jewitt, 2003) as well as narrative, point of view, knowledge and experience with the subject matter. Analysing sign systems requires the researcher to possess an understanding of the visual language, the culture in which it is generated, and the conventions of the material they are researching in order to identify and decode them (Alexander, 1994). Although complex, much can be gained through the interpretation of the raw visual material (Hewson, 1991). The use of diagrams during interviews enables participants to visualise their perceptions in order to reveal a different perspective on the same topic (Crilly *et al.*, 2006), with the intention of expanding the conversation.

### 4.3.3 Websites

Using two types of conversations was intended to provide two perspectives of the designers’ perceptions. To avoid interpretation problems – that is, interpreting the interview as real – Silverman (2006) highlights that it is critical to include another method in order to compare thoughts with actions. Grounded theory allows for the inclusion of empirical methods that can include quantitative or qualitative data. An obvious method for comparing perceptions with the implementation of interactivity was to examine the websites that the designers had produced, as well as others that they cited as inspirational. A protocol tool was therefore necessary as a way of detecting instances of interactivity in these websites. Protocols are traditionally procedures for undertaking scientific experiments that enable observations to be formally recorded. Protocol also refers to a system of rules or an accepted code of behaviour that could be used to measure frequent themes arising from the conversations in this study. To understand how best to evaluate the websites, I examined the literature from HCI and communications theory to determine if there was a preferred way of developing a protocol tool. What emerged were a series of heuristic evaluation methods used to test usability and a number of theoretical constructs that described the characteristics and attributes of interactivity.

User testing is considered a critical activity within the HCI domain discussed in Chapter Three. The objective of user testing is to ascertain the detail and quality of the interaction between the user and the website (Purpura, 2003; Nielson, 2012). As discussed, there is extensive research into usability, which focusses on giving the user tasks in order to observe the efficiency with which they are carried out and understood. Nielson and Rolf (1990) describe various methods of heuristic evaluation, including observational methods, think-aloud tests and remote observation. The development of

personas is another common practice that provides directions for development with regard to user requirements (Don & Petrick, 2003). Other methods used in HCI are user-centred design and participatory design, in which the intended users are part of the development process. User testing is usually conducted over a large sample of participants (Nielsen & Loranger, 2006) with the aim of identifying emerging patterns and adjusting live websites based on those patterns. This study did not require a sample of users for testing, as the objective of the protocol tool was to enable me to check for frequent themes arising from the conversations. As such, the protocol tool was a checklist that identified the presence of interactivity, as perceived by the designers. While it borrowed from think-aloud user testing, it was modified to suit the specifics of this study with me as the only user.

Examining theoretical frameworks in communication theory was particularly beneficial in the preliminary analysis of the websites. Using the language and diagrams from Jensen (1996, 2008), McMillan and Hwang (2002) and McMillan (2006) was important in establishing a working vocabulary of interactivity and identifying these characteristics in the diagrams and websites. However, it became apparent that for this study, a word-based classification system was limited because it was difficult to categorise the designers' visual and verbal responses, into these classifications. It became evident that I would have to develop a protocol tool that used the ideas behind the taxonomies, but which employed a different language that reflected the designers' expressive vocabulary.

#### 4.3.4 Conclusion

By thoroughly reviewing the literature of communication design, HCI, communications theory and interaction design, as well as the research methods used in these areas, I gained an appreciation of the preferred methods for this type of study and the problems that could arise from poor planning. Through experience at my work, I was acutely aware of issues discussed by Silverman (2006) in relation to interviews, in which researchers at times merely report rather than analyse. Similarly at work, I had also witnessed many students attempt to analyse designers' visual responses but fail, due to their reverence for the designer. Therefore I was adamant to ensure that the methods and tools used for analysis were rigorous and would deter any tendency to venerate the artefact or treat any aspect of the data as a true account of designers' perceptions without requisite interrogation. As such, it was necessary to use a combination of methods with an overarching grounded theory system of analysis in order to gain a deeper understanding of the designers. The present study can therefore be described as using qualitative methods to gather data using a grounded theory philosophy that guided the approach to both the collection and the analysis of data.

The data was collected over a period of three months throughout Australia. Website links were received up to six weeks after the interviews and were reviewed on an

ongoing basis for 18 months. These will be discussed in further detail in the next section concerning the data collection process.

## 4.4 | Data collection

In my academic role at university, I am in the fortunate position of having access to communication designers working across a range of specialisms, including publishing, advertising, packaging, brand identity, information design, narrative design, game design, motion graphics and web design. Within the current climate, the designers I am in contact with are committed to improving the standing of design within the Australian community. Many of them were early adopters of web technology, engaging with and contributing practically to the shape of the web. As a result the participants in this study were conveniently placed and primed for the interviews. This section describes the collection of data, diagrams and websites; the recruitment of participants; and the interview process.

The initial intention of this study was to represent the diversity of designers working in web design across Australia. Initially twenty designers were contacted for inclusion. Each potential participant was sent an email cover letter and an invitation to participate, which was followed up by a telephone call, if necessary, to discuss the interview in further detail. Some participants were contacted more than once, and all participants who were contacted agreed to participate. The location of potential participants was based on issues pertaining to gender, experience and years working within a web design context. Ideally the sample was intended to include designers with ten or more years of experience, designers with five or more years of experience, and designers who had just commenced working in web design. Within these parameters I was also looking for male and female designers working in the capital cities of Australia who would fit into the following categories:

- Creative directors within their own business
- Creative directors who were employed as such
- Creative directors working in a freelance context.

Communication designers not working in the web environment were excluded from the sample population, as I was only interested in people who had been working in the web design area for between one and ten years.

The design profession works to deadlines, with periods of varying workloads. Designers working within their own company are generally easier to locate, whereas freelance designers often travel for their work. A number of the designers, who had, at the time of asking in 2007, agreed to participate in the interviews were unable to participate in the interviews the following year. When organising the interview schedule in 2008, the design industry had become busy, making it more difficult to

coordinate the interviews. The final sample provided a cross-section of communication designers working within web design. The majority had over five to seven years' experience within web design, and all the participants had experience working in the print domain. Designers chosen for the final sample, fit into two categories:

- Designers working in the web domain only
- Designers working in the web and print domains.

Within the original selection of designers, there was a low representation of females working in web design. This is not a true reflection of the communication design industry, but it is indicative of the web area. It was interesting to discover how few females matched the selection criteria, and, despite their presence in positions such as directors or studio managers of design companies, generally they did not work intimately in web design or were not professionally trained designers, instead working in a managerial context. Between initial contact in 2007 and the actual interviews in 2008, I endeavoured to find more females that fit within the parameters of this study, but was largely unsuccessful. Due to their under-representation, when one female participant travelled overseas for work, I decided that, where necessary, I was prepared to use face-to-face networking software, such as Skype, to conduct interviews.

Table 4.1 summarises the methods used to gather data in this study, which involved three main stages of data collection:

- Interviews conducted with design professionals
- Collection of diagrams
- Collection of website links.

Initial interviews were conducted in April 2008, with seven other interviews conducted between May and June 2008. Diagrams were collected at the time of the interviews or shortly thereafter. Website links were supplied between four to six weeks after the interviews. Designers had been asked to supply URL links prior to the interview, but this was adjusted over the course of the interviews, and they instead supplied them along with confirmation of the transcripts.

*Table 4.1: Methods used to gather data*

Method	Time Period	Sample
Initial Interviews	April 2008	Victorian Designers/Educators
Main Interviews	May–June 2008	Australian Designers
Diagrams	May–June 2008	Australian Designers
URL collection	June–July 2008	Commercial Websites Pro bono/Self-initiated websites Inspirational Websites

Because the interviews were as much about designers' perceptions as the context that informed their opinions, the interviews included these background questions:

- Demographic details (age group, qualification, experience with computers)
- Education (professionally trained, self-taught)
- Professional design practice (kind of designer, medium or message)
- Commercial imperatives (designing communications)
- Ideas, attitudes and perceptions (deploying interactivity, clients, medium or message).

The interview instrument was developed in conjunction with the initial reading from the literature on design and interactivity. Mindful of the various perspectives of interactivity, an interview schedule was developed based on the perceived gaps in the literature pertaining to communication design. As discussed, the interview schedule was comprised of a range of closed and open-ended questions that can be seen in Appendix 3. The closed questions were reserved for familiarisation questions, such as age group, number of years as a designer, type of qualification and number of years working with computers. It was intended that these straightforward questions would ease the designers into the interview context and allow a rapport to be created. I was therefore surprised that the majority of the designers approached these questions as though they were open-ended, with an inference that these questions centred on their university experience or their first computer.

As the interview instrument was developed, careful consideration was given to the optimal way of including visual questions. I initially planned to email the diagram question, 'Can you define/map interactivity visually?' prior to the interview. After testing the interview structure with colleagues, I realised that the visualisation questions were better placed at the end of the interviews as a way to conclude the conversation.

Similarly, the position of questions requesting URL links changed after evaluation with colleagues. I decided to send the final questions to the participants via email prior to the interviews in order to stimulate thought in this area before the interview. Those questions were:

- 17. List two of your commercial projects that demonstrate how you implement your understanding of interactivity in web design
- 18. Name two self-initiated or pro bono websites that demonstrate how you implement your interactivity within web design
- 19. List two websites that you find inspirational in their use of interactivity and design. What characterises their inspirational use of interactivity?

Initially, the idea was that the designers would have these samples ready for collection at the conclusion of the interview. After the first interview, however, it was obvious that the conversation had stimulated different thoughts on interactivity and the designers required more time to provide URLs. Sending the final questions to the designer prior to the interviews was an effective strategy enabling mental preparation. However, during the interviews a number of the designers indicated a shift in their perceptions as they talked through their understanding of interactivity. On sensing this shift in perception, I adjusted the interview schedule so that they could supply the URLs after the interviews at the time of reviewing the transcripts. Not only did this shorten the interview time, but it also gave interviewees additional time to reflect on the interviews and supply website addresses that were more representative of their understanding and implementation of interactivity. Significantly, the designers submitted none of the URLs they discussed in the interviews.

The average duration of the interviews was 44 minutes (maximum 64 minutes, minimum 23 minutes). Each interview was audio recorded. Paper and pens were supplied for the diagrammatic task. The participant who was interviewed using Skype emailed a computer-generated diagram of interactivity. When the participants were contacted in August 2008 to review and confirm the transcripts of the interviews, They submitted specified URLs. All of the data was gathered and confirmed over a period of four months. As the interviews commenced, my ideas developed along with the project, particularly in terms of the questions I asked and how I asked them. I realised early on that designers treat a conversation similar to a brainstorm session, engaging in banter and a playful exchange of ideas that may or may not represent their own perspectives. As the process continued and the diagrams emerged, it was clear that the two conversations revealed differences between the verbal and visual data.

## 4.5 | Analysis of data

The methods involved in this study draw on a combination of traditional and visual methods and use a grounded theory approach to analyse the data generated. In the interviews, the designers constructed a narrative comprised of facts, anecdotes and imaginings. They drew diagrams using symbols and icons to visualise their perceptions. Diagrams are different to language because they do not speak verbally. They are representational and, unlike detailed conversations, are good for mapping broad themes (Crilly *et al.*, 2006). These methods formed the basis of two conversations with the designers, which were coded and analysed. This section examines the analysis of the data, the methods and the software used throughout the study.

As mentioned in section 4.4, the interview schedule (Appendix 3) was divided roughly into demographic/factual questions; practice and professional approach to design; perceptions of interactivity; interaction and interactivity in the design process; and recent and future perspectives on design for the web. Each tape was listened to and transcribed. Even though Glaser recommends against recording or note-taking during interviews, Dick (2005) suggests that the recording of interviews is appropriate when writing a thesis. In the transcripts, I recorded the verbal information only. As such, throughout the analysis, I read and re-read the transcripts along with the original audio recording in order to review non-verbal information, such as laughter, tone, frustration, confusion and clarification, which assisted in recalling the designers' overall enthusiasm and passion for specific topics within the interviews.

Spelling and other potential sources of transcription error in the data set were dealt with as I listened and read the transcripts and the data. In the confidentiality agreement signed by the designers, it was agreed that I would send a copy of the transcript for their approval. Data cleaning was an important process, ensuring the designers could understand the transcripts and check that they provided a true reflection of their thoughts and understanding. At this stage it was important to keep the recorded elements as uniform and consistent as possible, even though I was not yet sure of the organisation and analysis structure of the data to follow. I commenced note-taking immediately, in order to identify potential themes and questions emerging from the data.

Simultaneous with the transcription process, the diagrams were scanned, laid out together as an A0 poster and printed, as can be seen in Figure 4.2. I commenced writing memos, making notes that compared emerging themes from the interviews with theories from the literature. The main focus was to understand the underlying premise of the diagrams by asking the following questions about the diagrams: 'what is this about?', and 'what is being referenced?', then comparing the answers to each of the diagrams. When reviewing the diagrams, they were sorted into loose categories using existing taxonomies from communication theory. Using McMillan and Hwang's (2002) categorisation, the diagrams were examined to ascertain how or whether designers depicted interactivity as a process, a group of specific features, or as a perceptually based concept. The diagram of the key dimensions of interactivity (also in McMillan & Hwang, 2002) was compared with the diagrams and, later, the websites, and can be seen in Figure 4.1. Similarly, the categorisations developed by Jensen (2008) were initially used to examine the diagrams and, later in a comparison between diagrams and websites. Knowledge of Csikszentmihalyi's 'flow' principle, characterised by full immersion of a person in an activity (Csikszentmihalyi, 2002; Polaine, 2005) was important in identifying the characteristics of the some of the diagrams. After this initial review, the interrelationships between existing taxonomies and the visualisations were noted and further explored in the comparison between the websites and diagrams.

Figure 4.1: Key dimensions of interactivity. Redrawn from McMillan & Hwang, 2002.

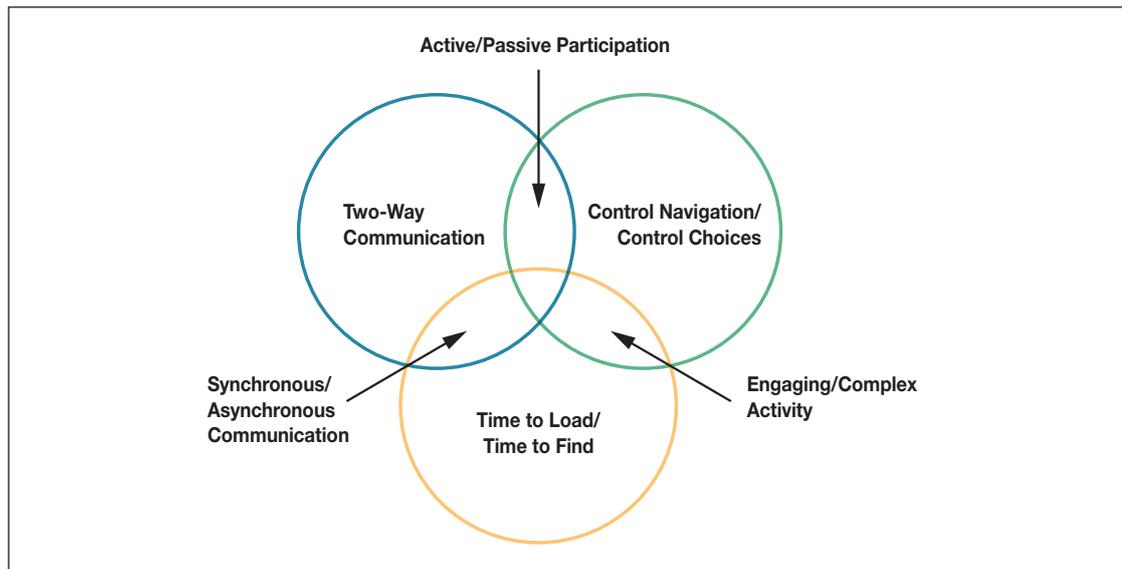
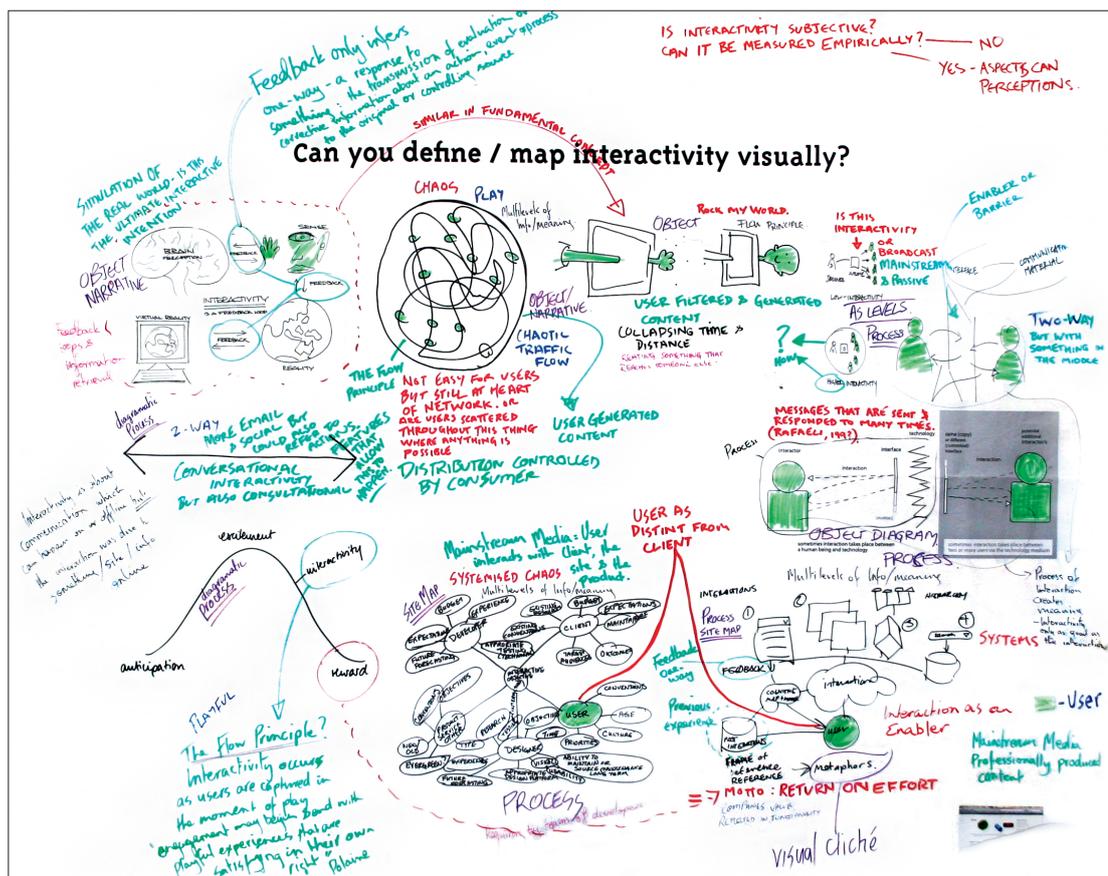


Figure 4.2: Identifying and classifying



Once the transcripts were completed and approved by the participants, the data was entered into an NVivo database. NVivo is a software tool designed to manage qualitative (and some quantitative) data. It enables the researcher to import, sort

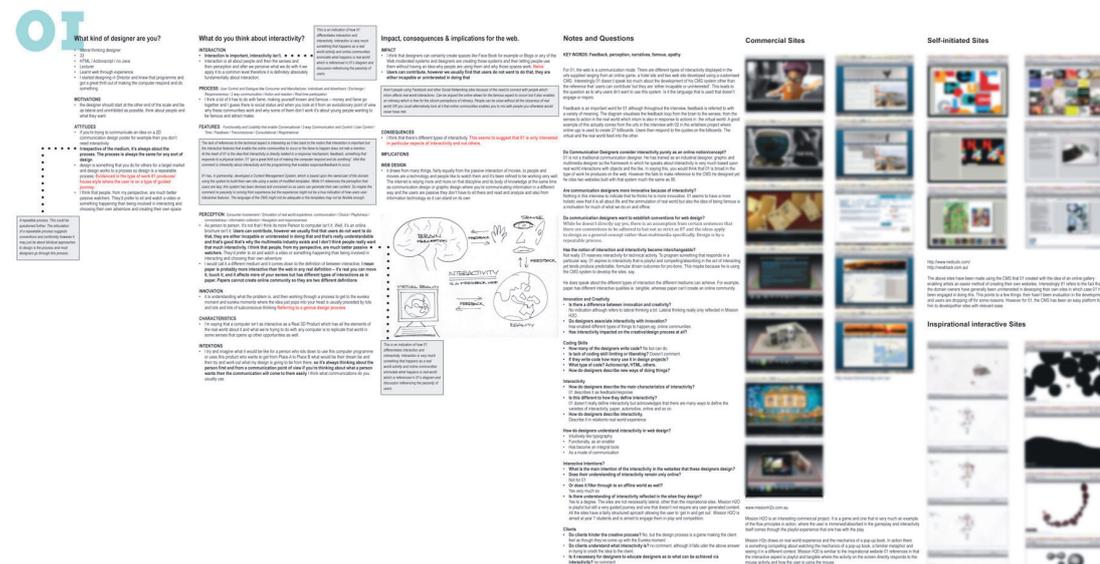
and analyse text, audio, video and pictorial images (although only text was used in the present study) by linking trends in the data or coding with specific references to words used by research participants. The demographic information was initially assigned to the attributes of the participants, which allowed for simple analysis of demographics such as age, gender, qualification and type of designer. In conjunction with themes identified from the interviews and the diagrams, the interview data was examined through the generation of word lists for high-frequency words. This process provided an indication of common words used by participants, which were developed into category headings or nodes for further analysis. These were clustered into common groups (e.g., interaction, interactivity, interactive intentions, innovation and characteristics). Text within the clusters was also examined (e.g., 'I ... got a great thrill out of making the computer respond and do something' and 'if it's not motivated with somebody in mind or solving a problem, or doing something in an interesting way, to me it's vacuous').

In accordance with grounded theory, I conducted the method of line-by-line coding, asking the same questions as for the diagrams – 'what is this about?' or 'what is being referenced?' – the answers to which were categorised into their relevant nodes. The ability to record personal reflection using annotation and memo functions in NVivo enabled me to store comments and emergent queries within the software. Of these, a series of questions emerged that seemed important and required further investigation. After developing a set of questions, I compared the answers across the data sets. As a result, the questions were reprioritised as not as critical as I had initially thought. However, the exercise established a comparative method of questioning that was continued throughout the study.

Although NVivo allows for the analysis of a variety of data, such as text, audio, images and video, some of the questions I had required the capacity to look at multiple images and text simultaneously. To do this, it was easier to create a designed template in which images and text could be printed at A0 size without the constraints associated with the software, such as multiple windows, small screen size and cumbersome interfaces. Being a visual person, the print format was a more efficient one for me to isolate specific points from the interviews and diagrams that related to the questions and that could be cross-referenced with the websites, as can be seen in Figure 4.3. This method was conducive to note-taking and quickly highlighted patterns for further investigation. For example, a number of designers associated interactivity with creativity. Initially, this was perceived as critical. However, after posing the question, 'does interactivity make you more creative?', it became obvious that this was not as important as originally thought, nor was it a shared ideal. Instead, this question highlighted that designers perceived interactivity

as a tool that enabled new and innovative methods of communication which empowered them to think differently about communication.

Figure 4.3: Questioning the data



Organising the analysis data into a series of answers to questions enabled me to examine the answers from a different perspective, using the visual material to substantiate or disprove emerging theories. Using this method I was able to compare the visual data with taxonomies from the literature. At the outset of this study, the intention was to develop a method of evaluating the websites based on existing literature. In accordance with this objective, an initial audit of the diagrams and websites was conducted as discussed previously using the following typologies as a loose guide for identifying interactive characteristics:

- Concept of interactivity (Jensen, 2008)
- Key dimensions of interactivity (McMillan & Hwang, 2002)
- Measures of perceived interactivity (McMillan & Hwang, 2002)
- Traditional models of interactivity: user-to-user, user-to-product, and user-to-system (McMillan, 2006).

Sketching and annotating on the sheets next to the diagrams, it was clear that these typologies were relevant, but also that they did not address the holistic or individual qualities of web design that designers use to engage and compel users. The typologies identify interactivity as objective with very few human characteristics. Although they speak of time, choice, face-to-face exchange and information flow, which all relate to humans, they do so from a rationalist point of view. While these elements were present in the websites, the designers spoke of interactivity in expansive terms that emphasised the limitations of the word-based taxonomies. As such, I adjusted my intentions for the

diagram and website analysis by developing my own protocol tool. Instead of comparing the designers' visual thoughts to typologies based on an intersection between HCI and communications theory, I designed a protocol tool that was informed by the data generated by the two conversations.

In order to compare and verify the designers' perceptions, it was necessary to develop the protocol tool as a way of checking off interactive elements within the websites. Data generated from the protocol tool could then be used to compare it with data from the interviews and diagrams, to ascertain any disparities between the datasets. Simply put, the analysis was a cyclical process in which the conversations informed the protocol tool, which was then used as a comparative and verification tool. The protocol tool was developed in the middle of the analysis stage and was used to review changes to the websites at six-monthly intervals over an 18-month period.

Building from the original categories used in NVivo, along with the notes from the diagrams and websites, designing the protocol tool provided the opportunity to create new classifications after coding, taking memos and notes. Borgatti (2006) states that it is not uncommon for grounded theorists to invent new categories after coding a large amount of text. He further comments that once new categories are established, grounded theorists rarely revisit earlier text to code for that category. In this way, new classifications replace older ones as coding and categorisation progresses and theories are evaluated and more considered in the later stage of the study. For example, the category Intuitiveness emerged from data coded in NVivo under nodes I initially had labelled interactive propositions, creative control, types of interactivity and characteristics of interactivity. As a result, the protocol tool rationalised the main themes from NVivo (eight main categories with 33 sub-sections and a number of free classifications that failed to fit into any predefined categories) into six main human-centred characteristics as listed below:

- Intuitiveness
- Feedback
- Responsiveness
- Experience
- Communication
- Enablement
- User.

Within these themes, there were further classifications, which were comprised more generally of interactive functions, objectives and visual manifestations. For example, the factors that constituted the theme of intuitiveness were navigation, metaphor and usability. As a mechanism, the protocol tool provided a simple way

of moving between the data sets to identify critical aspects of interactivity and measure empirically the difference between what designers say and what they do.

Each website was reviewed using an A4 checklist, which is reproduced in Appendix 3. Space was provided for an image of the website for recall purposes, and also for comments. The data generated from the protocol tool was numeric and could be visualised in graphs to compare the differences between commercial, self-initiated or pro bono websites. Further comparisons were undertaken between the designers' own websites and those they cited as inspirational. By creating a tool through which the data generated could be viewed numerically or visualised in graphs, I was able to understand the data in a different way and avoid the trap of simply reporting what the designers said, searching instead for the reasons behind the data (Fowler, 1995). While such data can be difficult to deal with because of its interpretive nature, it was important to look at the research inquiry from many perspectives. The designers discussed what they perceived as important using visual and verbal conversations, but it was only when I looked at the graphs that I could really see that the designers understood interactivity as a very specific concept within the context of the web.

Using these three methods – interviews, diagrams and website analysis – I was able to weave together different aspects of the data and investigate patterns that emerged over the duration of this study. Comparison of data enabled me to piece together an in-depth understanding of perceptions, shared ideals and the implementation of interactivity in web design. Checking the websites over a period of 18 months was critical in verifying emergent theories as well as comments that did not fit into any category, such as discussions regarding the longevity of websites and their underlying objectives (persuasive, task-oriented or information distribution). The diagrams were important in establishing a contextualised view of interactivity. From the two conversations examined in this study, a visual vocabulary of the characteristics of interactivity materialised and words such as play, reward, choice, efficiency, collaboration and communication all had some form of visual manifestation.

## 4.6 | Constraints of the study

In this section I discuss the constraints pertaining to this research and my own role as the 'primary data collection instrument' (Creswell, 2003) in order to identify any assumptions and biases I brought to the present study. I have an undergraduate degree in Graphic Design and have worked in the design industry as a practitioner. I have a Masters degree in Multimedia Design and more recently I have worked as

a design educator. The knowledge I bring to this project is that of a visual problem solver with an understanding of the design process and the challenges that confront designers on a day-to-day basis. Similar to the designers in this study, I approach a problem by looking at the different possibilities, and can communicate effectively through form.

Currently I am on the National council of AGDA, with whom I am working to progress professional recognition of communication design in Australia. I undertake these activities because I am passionate about design and would like to see it as a profession that is better understood. This broader perception of design has influenced the present research project. While I believe most designers want to achieve proper recognition for what they do, I have endeavoured to not be blindsided by my own outlook. That said, all of the interview participants showed enormous enthusiasm for the challenges posed by design, concept development and communicating visually.

Being a designer has been both beneficial and at times limiting throughout this study. The decision to undertake interviews was based on choosing the most appropriate way to gather information on the designers' perceptions. This was a task I had never undertaken in a research context, although I likened it to discussing project briefs with clients, which requires asking questions about their company and products, and differentiating between their wants and needs. While I was aware of the tangential nature of design thinking, I was unprepared for how much the designers deviated from the questions. Even though valuable data was gathered, it was necessary to refocus the designers and reframe queries based on how they perceived the questions. The narrative style in which the designers spoke, while difficult to code, highlighted their particular way of talking, which was rich with visual imagery and problem-solving rhetoric. Over the course of the interviews, my skills improved and the rapport between the designers and myself became easier to establish. Possibly because I was a designer, the designers were uninhibited and felt at ease speaking in the way described, compared with how they might speak to a non-designer.

During the preliminary research for this study, I perceived the topic of interactivity as an extremely complex and vexed issue for the designers. This was largely based on the literature from communication theory, which had discussed it in this way, and the contentious debates between HCI and communication design proponents Nielson and Siegel. It became apparent during the interviews that the designers had not previously spoken of interactivity as an isolated instance and were using the interview to develop their own clear picture as to what it meant for them. While not a constraint as such, I wondered whether my enthusiasm forced

them to think about the topic in a way that was generally foreign to them. Aware of the issues associated with leading participants, I was careful not to discuss my understandings of interactivity. However, when the designers sought clarification about the context of the questions, I was aware that my answers could bias their response. As such, I endeavoured to be as loose as possible in clarifying queries, which could have been perceived as a lack of necessary knowledge.

The lack of females in web design was problematic, because it did not reflect the gender diversity within communication design or, more specifically, graphic design. When the initial sample of participants was contacted, three were female and were happy to speak with me. In the proceeding year, one was on maternity leave and felt less inclined to undertake the interview, while another was completing work in Germany. It was important to include this participant, due to a declining sample of females. Therefore, she was interviewed online using Skype conferencing. Prior to the interview, I had assumed she would use the video broadcasting feature of the software. However, after contact was made the video component of Skype was not used in the interview and references to visual cues associated with face-to-face interviews were limited. I had adjusted the interview style for Skype delivery, but the interview posed some challenges regarding the flow and clarity of the audio due to delayed feedback, which reduced the spontaneity of the discussion compared to the face-to-face interviews. Nevertheless, when transcribing the interviews it was comparable to the other interviews. Initially I believed that the inclusion of females would highlight different responses to interactivity. However, any differentiation between genders was not recognisable in the analysis.

Other constraints on this study were personal and had to do with me being a visual thinker and the challenges this posed when interpreting the data. Initially I had been using NVivo software to analyse the interviews and create categories and subcategories for the data. As discussed in section 4.5, NVivo has the capacity to store images, audio and video for coding and analysis, and it can link to external websites. For the interviews, I found the software particularly useful. However, I found working on screen with layers of material cumbersome, preferring a method that could access larger portions of the data, which could be viewed at once rather than switching between windows on the screen. In order to analyse the visual data, spatial hierarchies were needed to fully comprehend what the designers were communicating and the interrelationships between data sets. To do this, design publishing layout software InDesign was used to organise the visual data and relevant theories for testing and evaluation. Because it was the first time I had undertaken this type of work, familiarising myself with and understanding my individual way of working was at first constraining and time-consuming but eventually liberating.

There were no overwhelming constraints on this study other than those posed by my being a first-time researcher. The combination of methods chosen for the study, guided by a grounded theory approach to the analysis, were appropriate and allowed for the capture of complexity. The diagrams provided a second conversation, while the data generated from the protocol tool verified theories developed through ongoing analysis of the conversations. As the thesis developed, there were additional queries that I had not considered, but I found the visual method of questioning the data became an effective method for answering questions easily and without fuss. Re-listening to the interviews intermittently also helped to reorientate the analysis. Since the interviews were conducted, more females have emerged who would meet the initial criteria set in 2008, but at the time of the interviews, females in this domain were difficult to find and also reticent to be involved.

## 4.7 | Conclusion

In this chapter I have described the collection of data, its analysis and the empirical inquiry in this thesis. The participant population was chosen based on selection criteria in the usual sense of a study sample. The literature review informed the development of the interview schedule, which included prompts to elicit more in-depth responses in order to answer the research questions. Data from the conversations was used to develop a protocol tool, and analysis occurred in an ongoing cyclical and comparative process to provide a rich picture of the attitudes, perceptions and practices of communication designers working in the web domain. With hindsight, there are aspects of the study that perhaps I would have done differently. However, I have been able to collect extensive data from a small sample that represented a cross-section of Australian designers, and identify sources of potential bias and preconception that would inform my research design and analysis tools.

# 5 | How do designers speak about interactivity?

## 5.1 Introduction

This chapter is the first of three chapters that report on the data generated in this study. The chief aim of Chapter Five is to examine how designers speak about interactivity, concentrating on the data generated from the interviews. Chapter Six examines the diagrams and how designers visually represent interactivity and Chapter Seven reports on the website analysis that demonstrates how designers implement interactivity in commercial web design. Additionally, Chapter Seven also reviews the websites that designers cite as inspirational in order to understand the types of constraints or limitations they work within. This chapter reports on the findings from the interviews in order to understand designers' thoughts on interactivity. Throughout the interviews, the designers discussed interactivity simultaneously as a broad construct and as a detailed practice. They created a narrative that was punctuated with anecdotes about concept development, the design process and interactions with clients, all linked by examples of interactivity that were applicable to the web as well as more traditional media. Throughout the interviews, the designers implied that the concept of interaction was synonymous with design well before the emergence of interactivity as a mainstream concept. Therefore, I intend to reveal the interrelationship between interaction and interactivity and whether designers perceive any differences between the two terms.

The purpose of these three chapters is to compare the different sources of insights. To do this I have structured the chapters in themes to ensure the findings are reported using similar headings in the same order. The structure of this chapter and the two that follow provide a comparison between the different types of data collected from the designers – interviews, diagrams and websites – and they have been organised according to the following themes:

- Understanding interactivity and the web
- Understanding the user
- The purpose of web design
- Interactive functionality from a design perspective
- Constraints on design for the web
- Conventions in web design
- Concept and design development.

After the process of coding and re-coding, patterns emerged in the categories that enabled me to organise the data into more distinct themes. Based on the frequency of comments within the themes, these will be used to examine the data to create a complete picture of the designers' perceptions and implementation of interactivity: which were similar, which were different, and general trends within the data.

Discussing interactivity with designers provided an in-depth insight into their professional practice. Throughout the interviews, the designers were candid in the discussion of their day-to-day activities, types of projects, their relationship with clients and their approach to design. This chapter creates a broad picture of the types of designers interviewed in this study, including information about their background, design practice and process, and how these elements have influenced their perception of interactivity. The designers elaborated on the relationships in communication design between contemporary culture, experience, behaviours, users, clients, interactions and communication, and the impact of these elements on the design process and final outcome. These influences all had a bearing on the designers' initial attraction to web design and explain, to some degree, how they perceive interactivity.

## 5.2 | How do designers understand interactivity and the web?

The interviews highlighted that designers spoke of interactivity as almost two distinct entities: a term that was all-encompassing and, more specifically, an integral component of the web. Evidence from the interviews established that they perceived interactivity as first a general notion that could apply to all design processes and any designed object, and second more specifically in relation to the web. Speaking about interactivity as a broad concept, the designers did not express it in definitive terms. Rather, they interchanged interaction and interactivity, giving the impression that their understanding was fluid in its meaning and that it extended offline, beyond the networked paradigm of the web. In the context of web design, they spoke of interactivity more definitively as an integral element that performed many roles: 'interactivity is the interface between what we create and the audience of what we create ... and involves everything'. As a collective group, they did not use the same terminology to describe interactivity, but personalised it in a way that aligned the term with their individual approach to web design. The designers described interactivity as playful, rewarding, transparent, immediate, useful, efficient, informational, transactional and desirable. While there was inconsistency in the language the designers used to articulate interactivity, a common theme emerged that aligned interactivity with human characteristics and positioned the designer's role as making the web human.

In the designers' eyes, interactivity could be intangible and invisible or tangible and visible and, despite these differences, they shared a common objective: communication ('to me interactivity – because of its absolute connection with the web, is just a new way of saying communication'). As visual communicators, whenever the designers spoke of the functional aspects of interactivity, it was always in conjunction with a visual manifestation that aided usability and the communication process, such as navigation systems, information hierarchies or other visual cues that orient the user and encourage them to engage. The designers rarely spoke of interactivity in isolation, rather they addressed it as an integral aspect of the outcome, as well as embedded in their design process:

Everything we do involves something that's going to be interactive with our client's audience. It's all about interactivity, but it's not as though interactivity is with a capital 'I' ... we don't often spend a lot of time talking about interactivity for interactivity's sake.

Because of its connection with communication, a common theme the designers spoke of was the interrelationship between interactivity and people, and how interactivity could be used to empower people. Within the interviews, they spoke about user experience, resonance and how well-deployed interactivity that displays human characteristics can enhance the overall experience, forging an emotional connection with the user ('interactivity ... [is] not just buttons and ways that people get information, it's everything – how I'm interacting with this person, how do I want to make them feel'). Other comments such as 'interactivity increases memorability' and interactivity helps to communicate messages in a 'cool' way 'that makes sense' emphasise the importance designers placed on making connections between interactivity and people in ways that create a meaningful experience. As such, the designers spoke of interactivity through scenarios that involved people, computers and real-world experience.

While the designers referenced interactivity as facilitating person-to-person interaction via the web, it was not discussed as a high priority within the commercial websites they developed. One or two of the designers discussed co-creation, that is, situations in which users are involved with the creation of content and redistribution. They commented that they endeavoured to include such facilities in their websites. One designer expressed interest in person-to-person communication for senior citizens: 'you can swap recipes and not have to wait ten days for your granddaughter to write back'. Overall, they perceived person-to-person communication to include designer-to-user, which involved directly communicating with the user through the information and functionality of a site.

The phrase ‘interaction is design and design is interaction’ highlighted how the designers exchanged the terms interaction and interactivity, throughout the interviews. The interchange of these words implied that the principles of interactivity were present in the communication design process prior to the emergence of the web. However, the designers also commented that much could be learnt from the new medium and applied to traditional practice, highlighting their understanding of interactivity as distinct from interaction. To explore this ambiguity further, one of the questions asked whether the web was more interactive than paper. While the designers gave different examples where interactivity could be applied to an offline experience, they all agreed that the characteristics of the web – such as immediacy, efficiency, playfulness, task-oriented transactions and ongoing change – made it a more interactive medium than paper. Significantly, a number of designers advocated for the application of practices derived from web design to traditional print media, suggesting that designers working in the print domain could apply knowledge about the user, gathered through analytics and metrics, to create designs that were informed and responsive to the users’ actual needs. They implied that these methods added credibility to their practice. Suggestions that print designers could evaluate posters using eye-tracking methods, or apply their newfound knowledge of behaviours and user cognition derived from the web to books and newspapers, highlighted contradictions in how they spoke of the term. On the one hand these designers considered their knowledge to be different from designers working with print, yet on the other, they discussed the concept of interactivity as though it had always existed in design. Designers therefore implied that interactivity had changed some aspects of their practice, but not others: ‘I think that web design has allowed graphic design to become communication design and to think more seriously as to what it is actually about’.

The ambiguity with which the designers spoke of interactivity requires further consideration. Speaking about interactivity in the context of the web, the designers communicated the term and its roles in web design with greater clarity compared to how they explained it as a broad concept. Within the web, the designers illustrated discussions with examples of specific projects, media formats or interactive objectives. By addressing the aims and objectives of a website, they were able to outline the various roles interactivity performed: ‘you might just want to get in there and get some information as quickly as possible and get out ...’ When they spoke of interactivity outside the parameters of the web, however, the conversation became more abstract, with no coherency as to how they perceived it:

Whether it’s a bookmark, teacup, annual report, website or sales brochure, there is an element of interaction in all of them, it depends on what level of interactivity you are trying to achieve.

After questioning the data and reviewing the comments comparatively, it emerged that ambiguity occurred in the semantics of the term. Designers discussed interactions rather than interactivity in non-networked environments or paper-based projects. This was significant in that, while the designers used the terms interactivity and interaction interchangeably, there were subtle references to context that indicated their use of the terms as distinct concepts.

The impression from the interviews was that designers had not previously discussed interactivity in such depth before. Through the dialogue, they began to think about interactivity differently and question how it is commonly understood: 'in recent years, interactivity has very much focussed on what's on a screen, but in a broader sense it's not necessarily just what it's related to'. In conversation, it appeared as though they used interactivity and interaction as the same term, yet comments throughout the interviews revealed instances in which they differentiated between the two meanings based on the context, media and project intentions. The designers understood interactivity in the context of the web within a commercial communication genre. Their interest in interactivity focussed on the new opportunities it provided to create communication experiences that were memorable and engaging. They perceived it as a tool that enabled user involvement and facilitated communication, as well as a concept that was applicable to traditional media. Practically speaking, the designers characterised interactivity in familiar terms: playful, rewarding, efficient, desirable or a skill requiring effort. They also spoke of its intangible qualities such as transparency and invisibility, implying that interactivity was a way of thinking or a form of knowledge required by all designers. From this perspective, the designers believed interactive principles could be applied to more traditional formats of design in order to encourage and enhance engagement between the communication and the user. Underpinning these comments was a growing interactive literacy that the designers had gained through their work with web design.

### 5.3 | Who are the users of web design?

As discussed in the literature review, normatively, designers are meant to work with people in mind, not just the design itself:

At the end of the day our designs need to provide an answer – and that was really about exploring what the brief is and what the customer needs – and answering that. The customer is the person on the end of the website and user centeredness and customer need are one and the same thing.

Scholars have discussed design as an activity distinct to humans (Heskett 2002; Friedman, 2000; Saffer, 2010). Simon defines design as the ability to develop 'courses

of action aimed at changing existing situations into preferred ones' (Simon, 1982). In the context of communication design, the designer designs functional forms that communicate information and are said to be persuasive, task-oriented, systems-oriented, transactional or instructional. The objectives of design vary from project to project. However, underpinning all design is the requirement to engage a specific audience in the communication, and to motivate them to respond in a desired way by creating an improved commercial status for the client. Target audience is marketing terminology that refers to the receiver of the message or information. Within web design, the word user gained prominence as describing the audience or receiver. Even though the terms audience or target market are still valid, user implies participation and an active engagement in the communication. This section investigates the user and attempts to identify how designers understand the user, the user's role in evaluating web design, and whether the user is a barrier to innovation.

Throughout the interviews, all the designers described their work as problem solving and explained how preferred situations evolved from identifying existing issues that consider the user and the context. The designers discussed methods used to profile the user, gather data and establish measures of success. Alongside more formal collection methods, they revealed their reliance on their intuition and empathy, which was informed by expertise they had garnered from previous projects and experience. Initial impressions revealed inconsistency in the designers' approach to the user. While they all commented on understanding the user's needs, behaviours and cognition, they each applied the information in different ways. For example, some of the designers approached web design with a user-centred approach, ensuring the user's needs were central to all design decisions. Others approached it with a genius design mindset, in which the user's immediate requirements ran counter to innovation.

You can gain insights from ... research [and] feedback around usability issues and communication issues, but I don't believe you should use that sort of work to generate ideas. The generation of ideas comes from us and we are the innovators. You can't always ask the audience what they want because they can't always see what's coming, where we can.

The designers perceived their role as future thinkers, making design decisions to develop the user's 'frame of reference' and build transferable knowledge and skills. While they prioritised the user, they also acted on behalf of the user by claiming that they understood their needs.

The interviews highlighted numerous methods the designers used to understand the user, ranging from systemised research methods to market research and more ad hoc approaches. The client, type of project, budget and timeframe determined the

ways in which designers developed user profiles. Some of the methods undertaken to profile and understand the user were:

- Focus group
- Webinars
- Metrics and analytics
- Strategic use of print advertising
- Channel planning
- User modelling.

Other methods used for gathering information about the user also included:

- Office polls
- Gut reaction
- Personal experience
- Intuition and empathy.

Different methods of collecting user information were attributable to the various fields represented by the designers. For instance, three of the designers in advertising and marketing spoke of user modelling and channel planning as methods used to construct user profiles in order to gain a clearer understanding of a specific demographic. While they spoke of data gathering, it was evident through anecdotes that their personal experience also contributed to the development of a user profile:

What I've always done is I've considered the person I am designing for, so if I'm designing for an 80-year-old woman ... [she] might want to feel secure and she may need bigger fonts. And she may not want to be frightened by the language.

Two of the designers spoke of user-centred approaches. While they claimed they used user-centred techniques, their approach differed from the kind of user-centred design discussed in scholarly discourse, as the dialogue was interwoven with references to the notion of genius design:

We have to rely on our own experiences and be confident that we're making certain decisions that are going to be right ... sometimes you have to run with a hunch.

This quote typifies the majority of the designers interviewed. While there were times when research into the user was heeded, generally the design process was not guided by research alone, but was interpreted and used in conjunction with the designers' empathy and intuition.

Ad hoc approaches to understanding the user emerged in sweeping statements, in which the designers made comparisons between old and networked media based on anecdotes. One designer stated that they thought users preferred a passive and

entertaining web experience. This idea contrasted with that of another designer who stated the web was a lean forward medium and that most users on the web were there to accomplish tasks. Significantly, the designers used the web-versus-television analogy to highlight the differences in media, but more importantly to show how the web prioritised the user:

It's got to be about the end user on the web. The second it's not about them is the second they'll go somewhere else and on TV you're getting free content in return for watching ads and if the web's not about the user it's like watching ads without getting your favourite TV show.

What was interesting about these one-off statements was the underlying premise that the designers know the user, yet they all have varying ideas of what the user wants, raising questions as to how well the designers actually know the user. The designers implied that they understood the user more than the client, however the interviews indicated that their knowledge might be little more than a stereotypical knowledge.

The designers' comments suggested that they believed they had a better understanding of the user than their clients. Throughout the interviews the designers consistently referred to problems associated with the clients' lack of knowledge regarding their target audience: 'you can't always rely on the client – it's amazing how many clients don't know their own audience'. The designers asserted their role as mediators between client and user, commenting on their need to know the user – their habits, needs, requirements, language and lifestyles. Despite a seemingly intimate knowledge of the user, there was little evidence to support these perceptions. Only one of the designers described the user in any detail – an 80-year-old woman or a real man building a pergola – while the other designers omitted any identifying features, referring instead to a generic figure called the user, who remained broad and nondescript.

The interviews revealed a gap between a perceived and actual knowledge of the user that the designers claimed to possess. Based on the evidence, it could be argued that the user remained generic and without character. Questions on the interview schedule did not ask for specific user details, however the frequency with which the designers commented on users' needs and requirements were noteworthy, as this knowledge seemed to guide the design process. All of the designers commented extensively on user needs, yet it was surprising how few of the designers conducted user testing prior to a site going live:

Analytics are always in place, so we can review and audit where people are falling out of websites, where they're spending the most time ... but we have to test every step of that process – if a user comes along and can't access the ... detail quick enough they get frustrated and move on.

It was apparent through this, and similar comments, that while testing occurs, it is generally through an evaluation process after the website is launched. Comments such as ‘we, as a methodology, provide a decent amount of testing and are always encouraging a greater level of diligence in doing so’ required further examination, based on the conflicting accounts of how user testing occurs. Some of the designers spoke of the empathy they possessed that enabled them to evaluate a website from the user’s perspective, while others spoke of constraints that acted as a barrier to testing: ‘if you stopped and tested every single aspect of the site, you would never get anywhere’. While it was apparent that testing was critical to the development of web design, evidence showed that much of the testing was undertaken in-house using the designers themselves, ‘the best users’, emphasising the distance between the user and the designers.

Nevertheless, the designers did not consider the process diminished through a lack of user involvement. In fact, some designers commented that in some instances it was preferable to exclude the user:

It’s hard when you ... put the users at the centre ... it’s very hard to innovate because the average person replicates their knowledge and applies what they already know and things that are common ... if you want to change things you can’t test everything and put the ordinary user at the centre.

Within the context of the quote the user still remained pivotal as the end receiver. However, this comment stressed the need to ‘run with a hunch’ to make decisions that would advance the user’s knowledge and behaviour.

The interviews reveal contradictory sentiments and remote relationships between the designers and the user. From one perspective, the designers positioned the user as their primary concern, asserting their own role as the arbiter. From another perspective, the discussions implied that users’ knowledge was generic, which enabled designers to overlook specific user details. The generics of the user were further highlighted by an overall lack of user involvement in the design process. Furthermore, while some of the designers suggested user testing throughout development as positive, adding value to the overall user experience, there was also the suggestion that too much user testing inhibited future thinking. The designers were open in their discussion regarding innovation in web design, and in all interviews they elaborated extensively on how their practice was innovative. Significantly, any discussion regarding innovation circled back to the user, but it was interesting that they imposed a caveat on their design – namely, that innovation must enhance the user experience, as opposed to innovation’s for innovations sake. To this end, the designers admitted that while their knowledge of the user might be scant or that they might not involve the user during the process, their commitment to the user experience was their primary motivation that determined their design direction.

## 5.4 | What is the purpose of design for the web?

The previous section examined designers' perceptions of the user. The user was discussed as pivotal in determining the tone, aesthetic and approach to the functionality of a website. Other themes closely linked to the user concerned the purpose of commercial web design. While these two areas are interlinked, they are distinct components that contribute to the development of web design. This section lays out the themes that emerged in relation to the purposes underpinning design for the web, ranging from broader to more specific objectives.

The designers spoke frequently of the practicalities of design, where the intention of a project was to communicate effectively and with clarity. Having a clear intent underpinning a design project was believed to be a critical driver that differentiated commercial practice from artistic endeavour. One designer stated that 'art [is] something you do for yourself, design is something you do for others', while another asserted 'my design ... needs to look beautiful and be considered ... if it's not motivated with somebody in mind or solving a problem ... to me it's vacuous'. Such statements established the user as central to the purpose, as discussed previously, but also demonstrated the designers' perception that to achieve the stated purpose, design had to be useful, desirable and functional. It was interesting that the designers used the distinction between art and design to promote the value of design.

Eight of the nine designers also referred to the difference between art and design to demonstrate how the focus on the user affects the purpose of design. They also used this distinction to highlight how the purpose of the web had shifted from the experimental interactive experiences prevalent in the early 2000s to more practical experiences that enable users to accomplish day-to-day tasks. The designers were not dismissive of artistic endeavour. In fact, they suggested that research and development, which allowed experimentation without a specific user in mind, was imperative. Four designers commented on the importance of play and exploration in web design, as it provided new ideas, insights and techniques that filtered into commercial projects.

Throughout the interviews the designers also commented on the methods they employed within web design to achieve the broader communication objective. While they spoke of new and fresh ways to deliver information, they adhered strictly to the primary purpose:

We're always talking about audience first and foremost and, based upon who the audience is, what their point of reference is, what their understanding of technology is, what computer hardware and software they're using, what sort

of internet connection they have, etc. and more importantly why they're using a particular website that we're building [which] will determine the way we approach the interactivity.

Whether the stated purpose of the website was promotional, informative or transactional, interactive characteristics developed by the designers were used to communicate and achieve the intended purpose. The designers frequently identified common characteristics such as play, reward, fun, emotion and information to describe the tone of the website. While one designer commented that their job was 'to design an easy-to-use, enjoyable, empowering interface that people will feel at ease getting a task done', another suggested that empowering the user with cute and playful features can help foster an emotional connection.

Underpinning all discussion of design and interactivity was the communication imperative. The findings indicated that communication was delivered through a functional experience that was not limited to image and text, but incorporated sound, motion and invisible elements such as interactive functionality and immediacy. The designers communicated their belief that the increasing possibilities for communication via the web made design a more complex proposition with multiple objectives, compared with design for printed material: 'you can see [graphic designers working with print] don't have that empathy for usability, they're thinking about the aesthetics [rather than] communicating through design [and] functionality'. The accuracy of these comments is not in question, however, it is important to note that these designers understand that the purpose of web design is to motivate and shift the user's behaviour in some way:

The worst thing you can do is to motivate someone to act, but you don't give them an outlet [to] act ... what we do in design is to help the user to take the next step, and continue the relationship.

Through comments such as these, the designers emphasised the importance of interactivity in reducing the gap between the communication and user response. The comments also implied that the purpose, whilst more complex, could be achieved in more ways than were previously available to designers in a print paradigm.

The idea of empowerment emerged frequently throughout the interviews as designers spoke of enabling users to navigate through digital space, complete tasks or voice an opinion. As a theme, empowerment was raised by the designers as a primary concern of the web experiences they design. In a conversation regarding conventions, one designer commented that shared expectations would empower the user through a common approach to interactive functionality: 'if there was an agreed framework of standards ... the user would have a better experience [and]

know what the rules of engagement are'. This sentiment was shared and discussed by some of the designers typified by the quote below:

I think it's a huge ask to expect a [user] to come to your site and learn how your site works when it's quite different to any other website. It's an enabler for them. The navigation is not their focus at all. It should be as transparent as possible, meaning as familiar as possible.

Time was also associated with empowering the user. Comments that communication occurred in the first 'three-and-a-half seconds' when visiting a website highlighted the critical nature of timing when communicating the website's objectives, information structure and navigation rules:

The most important thing of any website is defining what the role of the website is. Is it there to sell something, is it there to give people information, is it there to get information from them, is it a shop, is it meant to be a TV?

If the purpose was communicated at the outset, the designers implied this would increase user retention, because they would know what to expect. From a commercial perspective, empowering the user was perceived as reflecting positively on the brand, which was commented upon repeatedly:

If it's a website ... to get things done, find the product, put it in the shopping cart, then buy it, then the goal is to make it as efficient as possible, but still aspirational, enjoyable and reflecting ... brand values.

Similarly, another designer commented, 'if someone ... has a great experience and finds what they're looking for quickly, then they're going to be happy with the brand'. The majority of the designers spoke of the benefits of a positive experience, citing the Apple website as best practice, with its uncluttered site design, simple functionality, accessible content and clear information hierarchies communicating the purpose of the website as well as Apple's commitment to an intuitive user experience.

All of the designers understood the critical need to engage the user, however the interviews suggested that the core components used to engage users – communication, intuitiveness, responsiveness and content – also empower users. The designers spoke of equipping users with the tools required to navigate the website and respond to the content. They discussed time, a core component underlying the purpose of the web, and the need to make sense of complex information. These aspects were considered to be important in engaging and empowering the user, allowing them to focus on the content and communication of the website. Within this framework the user remained a primary focus in that the purpose of the site revolved around the user and the efficient communication of the website's objectives and functionality.

Implicit in the discussion were client requirements that underpinned any communication. The client's needs are concerned with communication problems, therefore there was no need for the designers to discuss the clients in detail. That said, the designers did discuss clients in relation to their lack of understanding of communication on the web and ways to engage the user.

## 5.5 | How do designers speak of interactive functionality?

This section examines how the designers spoke of interactive functionality, which refers to interactive features, such as programming, that facilitate interaction between the user and the website. When speaking about interactive functionality, three main themes emerged:

- Understanding interactivity as a transparent element
- Gaining the skills required to understand interactive functionality
- Practising good visual design in order to enable the user.

This section examines these themes to further understand the designers' perception of interactive functionality. It was interesting that while the designers frequently discussed interactive functionality in relation to buttons, tasks and/or transactions, throughout the interviews they rarely spoke of the technical features or programming languages associated with the behaviours of those items. Instead, interactive functionality was discussed in relation to visual elements and metaphors that described its effect and impact. At the core of these discussions was the normalisation of interactivity and the work undertaken by designers to make interactive functionality familiar.

The designers spoke of interactive functionality as invisible, transparent, seamless and integral: 'good interaction design, in my area, is the interaction that you don't notice, because it's just natural and intuitive'. One designer commented that interactive functionality was the invisible infrastructure of a website that allowed users to focus on the content or communicated message. It became apparent that the designers used human characteristics to give this invisible element personality and tone, otherwise the designers had difficulty articulating their thoughts: 'on the web ... you can use any type of interaction that people are familiar with as a device or a metaphor'.

Eight of the nine designers had an in-depth knowledge of the complexity of creating interactive functions. All of them had either worked alongside programmers or had themselves learnt programming languages. Surprisingly, the designers who possessed programming and coding knowledge chose not to practice these skills, suggesting that programming and design were two highly specialised and diverse fields: 'It's just very hard ... [being] in both spaces'. Other comments highlighted a lack of

coding knowledge as both debilitating and liberating – debilitating due to a lack of hands-on programming skills: and liberating because their creative direction was unlimited by technological constraints or expectations.

I've had a lot of experience with the programming side. When I was ... designing websites, because I knew what was ahead with the programming, ... that limited the range of my design and I was operating within a set framework rather than being really free.

The experience of the designers with programming and coding varied, contributing to a diverse understanding of interactive functionality's potential, its breadth and the types of functionality that could be achieved. A common perception of the designers was that interactive functionality was perceived as a skill and specialised knowledge essential for communication design practice. This seemed to be at odds with the fact that the majority of the designers either could not or chose not to program or write scripting code. Therefore, when the designers spoke of interactivity as a skill, they were not speaking of hands-on programming, but rather a specialised interactive literacy that enabled them to develop design strategies, concepts and information hierarchies as well as enabling them to oversee the production of an interactive website.

I'll walk over to the designers and say, 'We can present information like this, how about that?' And to the tech guys I'll say, 'Can we use Ajax to pull up this data so people can see this instantly and be able to access this and be able to do a search and generate this on the fly and get this result?' I might spend 60% talking to designers and 40% talking to programmers.

The designers implied that, due to the complexity of web design, a collaborative approach was necessary. While collaborative relationships are not new to design, this is different from how the web first emerged, when everyone wanted to own it. The designers spoke of the complementary skills of designers and programmers and the need for both in web design.

Designers reported that interactive functionality was a major factor of web design, but not the only component: 'the two will coexist forever' because the practical [programmer] provides the delivery while the [designer] provides the soul.' Because of the communication imperative of the web, the designers implied that the two areas had to be developed in conjunction to ensure that communication is clear and useful, and that it reaches the intended audience.

Therefore, the designers spoke of interactive functionality as both transparent and highly visual. Their reticence to speak about the technical aspects of interactive

functionality implied that these aspects were difficult for them to articulate. Because of its invisibility, the designers sought to apply familiar visual language and metaphors to interactive functions in order to communicate its function to the user. To this end they visualised interactive functionality and, by doing so, normalised the term within a design frame of reference. Although the designers spoke of interactive functionality as an essential skill, the data suggested that this skill was associated with an interactive literacy or knowledge required by all designers working in collaborative web design.

## 5.6 | What are the constraints within which the designer works?

In this section I will explore the constraints under which designers practice. All designers working as problem solvers are familiar with the boundaries of project briefs. It is often through tight restrictions that the most innovative work occurs: ‘my main role in the business as Creative Director is putting up boundaries to work within so that we can flourish and not spend time meandering’. This statement echoed the sentiments of the other designers and highlighted that if there were not constraints in a project, they would impose their own. The interviews showed that the designers were involved in a process that required them to think of constraints as design considerations. Therefore, this section distinguishes between project-specific design considerations – such as budget, content, scripting language, colour and audience – and constraints that the designers perceived as a hindrance to achieving an innovative solution, namely:

- Clients, graphic designers and the reliance on old practice in new media
- The ethics of accountability
- The predictability of the screen format.

While these constraints are not new, the designers commented that these were the ones hindering the transition of design thinking and marketing practices from a print tradition to the web.

The main constraint designers associated with the web and interactivity was the client and their perceived lack of knowledge about the user, the web and interactivity. The designers believed the client was the primary barrier to the development of innovative and well-considered web design. They spoke ambivalently of clients, citing many examples in which their clients had hindered the design process. While the designers admitted clients played a necessary role in the design process, the findings demonstrated that frustrations occurred due to a lack of shared expectations, including the transference of ‘old practices’ – marketing and print design – to the web:

I am still amazed at how some marketing people don't really understand their audience, they're more concerned about their budget, their boss, the share price and how much work they've got to do ... some of them do understand their audience and some of them don't.

In some cases the designers spoke of clients who understood the user, the web and interactivity; but were restricted by the context of their work. Despite these exceptions, the majority referenced problematic clients whose lack of understanding extended to where and when designers should be involved in the process: 'you are on the receiving end where decisions are made before creative thought has been considered, sometimes you're brought late to the party and ... you've been given a few options inside a narrow corridor'.

The success of a website could be revealed easily through analysis of user traffic. The designers commented that these reporting mechanisms sometimes had the adverse effect on clients, especially when they were not prepared to move from a traditional and less transparent approach: 'our medium is very accountable and ... sometimes [clients] don't want to take the risk. They would rather go for a television ad, which [is] very boring, but the reporting mechanism is limited'. Additionally the newness of the medium was also perceived as a constraint that made clients less likely to take risks associated with innovative web design:

Innovation can sometimes be expensive because you're developing something that's never been done before ... some clients [say] 'I've got to go and sell this to my boss. I'm not very comfortable, my boss is really boring, and he's going to go "No" and that's going to make me mad, so I won't do it'.

The ongoing tensions between designers and clients highlighted the need for designers to develop an ongoing relationship founded on trust. With trust, they argued, anything could be achieved: '[does the client] trust you to come up with concepts that are innovative and still make sense for the brand?' All of the designers spoke explicitly of unique strategies they used to develop trust and gently guide the client; 'the trick is to make the client think it's their eureka moment ... you have to softly [shift] them to where they need to be'.

The idea of the web as an accountable medium was frequently mentioned in all of the interviews and appeared to have many implications for the designer. Designers spoke of web design as the catalyst for design accountability – that is, ensuring their design took heed of user behaviours and response. Some of the designers criticised graphic designers continuing to rely on intuition in their practice. They believed graphic designers should conduct evaluative methods to test the effectiveness of their design. The designers spoke of analytics and metrics that had been deployed in web design to

ensure that sites functioned in the intended way. Much of the tracking methods enabled designers to examine how users comprehended the site:

Now you can visualise this with a funnel where people are dropping out and if they're all dropping out on a particular point, then you can then go and check the interaction at that point. It might be that you've asked a question that people don't understand.

It was significant that designers perceived these evaluative tools as contributing to a more robust design process. For them, this was the point of differentiation between their practice and graphic design:

The most common thing [graphic designers] do is make everything flat, there's no dimension, there's nothing to indicate what is content, what is interactivity, so the text and the navigation looks identical to the content.

However, they also discussed the problems associated with this new accountability. Websites were considered to be 'living breathing medium[s]' that were subject to continual change, the implication being that web projects never ended. The designers commented that these changes contributed to fatigue amongst web designers.

While the designers spoke of the new opportunities afforded by the web, there were comments regarding the expectations of the web as always changing. Designers discussed the evolution of the web as becoming bigger, better, faster and quirkier. Furthermore, while the designers discussed the screen as the interface that enabled them to explore new modes of communication by collapsing time and distance, findings from the interviews also suggested that the physicality of the box format was problematic, and careful consideration was required to create a sense of presence and respect for the user:

There's a screen between you and the product or the experience, whether it's a bottle of wine ... or whether it's an Arts Grant. Your time is precious, regardless of whether it is a short time or a long time, and I have to manage that interaction in a way that is engaging, is unique, is memorable.

The new types of constraints posed by the web were perceived as those that made web design rigorous and different from graphic design. The screen was perceived as a predictable format, yet it was a constant issue for every project and, as such, became one of the usual design considerations. Therefore, key constraints, aside from the usual design considerations, primarily focussed on the client's lack of knowledge. While the designers implied that the client issue could be overcome through good client/designer relationships, the frequency with which the designers mentioned them indicated the reticence or inability of clients to understand the intricacies of the web. Also apparent

from the interviews was that there was a convoluted set of problems around the client/designer relationships that were difficult to tease out. Nevertheless, the designers highlighted various points at which the client hindered the design process, including their lack of knowledge regarding the user, their reliance on old paradigms and their resistance to evaluative measures.

## 5.7 | How do designers speak of the conventions of web design?

Conventions can be referred to as a set of standards and/or rules that guide the design and behaviours of a website. When discussing conventions in the interviews, there were different perceptions at play. Some designers alluded to common protocols developed by the World Wide Web Consortium (W3C), while others were concerned with visual and aesthetic conventions. Within the different perspectives, the interviewees were also divided in their attitudes towards these conventions, seeing them as enablers but also as predictable. This section examines the conflicting attitudes regarding conventions and the ambiguity with which designers approach and implement them.

Designers are notorious for breaking the rules for the purpose of communicating to the user in ‘new and surprising’ ways. The designers in this study were no exceptions. They recounted their initial response to the early web, when they redesigned hyperlinks so that they were more visually engaging. Comments from some of the designers suggested a heavy use of conventions within interactive functionality in areas such as navigation, transaction functionality, search tools and game functionality. They discussed these elements alongside user behaviour and expectations. The designers described how in their endeavours to make the web more intuitive, conventions helped to establish transferable knowledge, patterns of behaviour and user expectations:

Our focus should be on the content within the site and the navigation should be transparent. It’s about familiarity and if you can use navigation that somebody has already learnt at some other point, then they can concentrate on the messages.

This point of view was shared by many of the designers, but articulated in diverse ways that were open to interpretation. During the interviews designers often referred to the visualisation of interactive functionality. While it was stated that visual cues representing functionality, such as navigation, should be consistent with the tone and aesthetic of the website, it was also suggested that these elements should be invisible. In the discussion it was apparent that the designers created and produced unique web experiences with highly visible visual aesthetics, language and tone. The premise of the discussion was that the functional elements were visible through information

hierarchies, but remained in the background so as not to compete with the content. The designers argued for a shared set of behaviours that encouraged the user to approach the web in a specific way but did not restrict the design of the content:

If there was an agreed framework of standards ... I think the user would have a better experience, because they would know what the rules of engagement are.

In this context the designers spoke of educating the user through a set of familiar metaphors that enabled a no-fuss approach to the web which built on the user's previous experience, and which was transferable. One designer described conventions as a 'friend', and while this sentiment was shared by a number of the designers, one expressed concern that the use of conventions would produce unoriginal and 'boring' websites. Therefore, on the one hand the designers associated conventions with familiarity, while on the other they equated it with predictability.

In the interviews the designer discussed conventions from a range of perspectives. While they had implemented functional conventions to enable the user, they also described cultural codes and conventions from which they had conceptualised and constructed innovative solutions:

I worry that I might not be very innovative, but ... if you combine existing things that's when innovation starts ... you put together pieces – that people know – into a different context [to] tell a story in a different way.

The concern expressed with regard to conventions can be better understood as a warning against a formulated or step-by-step approach to web design. The designers reinforced the need for innovative thinking within web design in order to shape the web experiences that intersect with our day-to-day activities. They were concerned, however, that the misuse of conventions in web design could limit the design possibilities and future scenarios for the web.

When the designers spoke of behaviours and actions in relation to interactive functionality, they used terms such as standards, conventions and familiarity. When they spoke of the visual language associated with interactive features such as navigation, they did not use the same language. Instead, they referred to metaphors, appropriate design, tone or aesthetic. There was a significant shift in language between functional and visual conventions. While they condoned the use of functional web standards, the idea of a predictable approach to visual elements was unacceptable to the designers. Within their design process, designers used conventions to inform, inspire and ideate. In production, they referred to web conventions that underpinned the website to ensure usability. Nevertheless, the final solutions created new meaning by meshing a combination of metaphors, familiar behaviours and rules in an unconventional context.

## 5.8 | How do designers create concepts and design for the web?

In the previous sections, all of the elements that designers considered throughout the design process have been discussed: the user, the purpose, how interactive functionality is perceived, the constraints, and use of conventions. Designers described how they wove these elements together to construct project parameters within which they developed ideas and visualised them. The interviews provided the designers with a forum to discuss their unique approaches to design. They spoke of identifying problems within an iterative and collaborative process. The dialogue revealed the fluidity of the design process: designers asked questions; engaged with clients, colleagues and programmers; and scribbled or mulled over ideas. They believed that this reflective process was an essential part of their thinking. These discussions provided valuable insight into innovation and the complexities of concept development, as well as the rigour of designers' practice and their relationship with the user. In this section I will explore how designers think about the message and the medium, focussing specifically on how they develop innovative concepts for the web. I will also examine the two types of web design prevalent in the conversation: advertising websites and information systems.

Throughout the interviews the designers answered questions and extrapolated on ideas through narrative and anecdotes. They referred to the initial stage of a design project as paper-based, in which the project parameters are established through sketching and conversation. Regardless of whether the designers possessed specialised computer knowledge, they did not refer to the use of computers assisting the ideation process. Instead they spoke of paper, pencils, observation, ideas and questions. Rarely did they discuss concept development as an isolated activity. Rather they described it as one that involved conversations with many people. The designers expressed their passion for concept generation in comments such as, 'I like ideas', 'we apply an approach and a thought process', 'it's ideas driven, coming up [with] solutions and solving problems' or 'we never start anything without a conversation and some sketching'. They highlighted the emphasis placed on concept development as the element that differentiated their practice in industry. This tradition, known as brainstorming, has remained unchanged in the transition from print to digital domains. What has changed, however, is the scope of elements within web design, such as information systems, digital space, user behaviours and cognition.

As discussed previously, the designers viewed the web as a very different medium to paper, but they approached design for either form in a similar manner, claiming that the message was the priority, not the medium. However, in the

ensuing discussions it became apparent that the medium was intertwined with the message, and the designers' comments highlighted little distinction between them. Some of the more experienced web designers inferred that the message had become an increasingly complex proposition that was communicated across multiple dimensions. Throughout the discussion the designers implied that all of the elements of the design process worked as a whole and therefore the message could not be thought of in isolation:

What we do is ... digital, so interaction is constantly plugged into the solution, where do we put the link, how do we put the link, what are people trying to get out of this site – is it better to do something with video than do it with written word? Is it better, actually, to get them to click a button so that it sends a message to their mobile phone so they can look at it when they're outside?

The designers revealed how the medium and the message have become the same thing, regardless of whether the medium is folded paper or mobile devices. When they spoke of the message and the medium, they explained a linear process in which the message determined the medium. However, on further inspection the findings revealed the interrelationship between the medium and the message where each influences the other:

The message always has to be the primary concern ... and deciding the best way to deliver that message and then the media would be considered. Obviously if there is a certain message to be delivered to a certain age group for example, then there are certain medias that need to be considered ... but if you're going to [use] video, internet and print, there's three very different mediums that you can use to communicate the same message ... it may be delivered slightly differently in each of those mediums.

The discussions revealed two approaches to web design: a campaign-style website that had a short lifespan, or an entire website – infrastructure, information system, functionality and content – designed and developed for longevity:

In the marketing space there's definitely a lot of room for the big idea ... it's a campaign, it's going to be around for three months, you get people's attention, and cut through, but ... if you're building an infrastructure site like Apple.com ... it's really just a place to house ideas and the ideas are going to change all the time.

The types of websites the designers spoke of were based on their field of practice. Those designers working in the advertising paradigm spoke of campaigns that were uploaded to a website for a short time, whereas other designers from the group discussed the design of information systems whose web life was considerably longer. While these two objectives were evident in the interviews, both had commercial priorities and overlapping intentions.

In most cases the designers believed their practice to be innovative, working within strict project parameters to resolve a problem in a new way. Innovation was a high-frequency word throughout the interviews, but it is important not to confuse innovation with originality. Seven of the designers referred to their work as innovative in their reinterpretation of existing ideas, stories, metaphors or visual language to create a 'fresh', 'clever' and 'memorable' communication '[that's] never been done before'. The designers in this study implied that innovation was predominantly focussed on delivering information in new ways that gave new meaning to familiar objects or narratives.

Initial observations highlighted a link between the web and innovation. Further examination revealed that the designers recognised the advantages of the web's capacity to house and distribute multiple media formats, which provided them with 'unlimited opportunities' to create new meaning and be clever in their communications. To say that designers were more innovative because of the web could be misleading, but the web per se has enabled new means of expression: 'it's much easier for me to be a creative person, break new ground or be clever, because there are so many more assets that I can play with'. Arguably, the way in which the designers spoke of the web positioned it as a tool that provided new opportunities for creative thought and new ways to communicate and interact.

The designers gave the impression that aspects of the design process, such as concept development, had not changed dramatically with the emergence of the web, yet throughout the discussion there was a heavy emphasis on the medium when discussing the message. It was apparent that the designers believed the interactive functionality of the web enabled users to actively engage with the idea, resulting in the medium being integral to the message. The designers implied that the web enabled them to think about communication in new and fresh ways, attributable to the variety of assets they could access. Drawing on the design considerations mentioned in previous sections, the designers used these to establish boundaries, and therefore developed concepts within this framework. At each stage, the user was critical in discussions regarding the message, and the medium was discussed at length.

## 5.9 | Conclusion

The evidence provided in this chapter demonstrates the complex layers and interrelationships at play when speaking to the designers about interactivity within web design. Within the interviews, the designers expressed a range of ideas, some of which contradicted their own and other designers' opinions. A level of ambiguity was

present throughout. This was not restricted to the topic of interactivity, but extended to descriptions of web design and the factors contributing to the design process.

The following section concludes the chapter by reviewing important points that will require further discussion within the themed structure in subsequent chapters exploring the diagrams and the websites. It will also revisit salient themes that emerged from the interview data in relation to the research questions outlined in Chapter One.

All but one of the designers were drawn to interactive media and web design as a natural progression of their current practice and by the appeal of ‘making the computer respond’. Despite the attraction to interactivity, the designers gave the impression that they had never spoken of the term from a theoretical perspective: ‘they’re tricky questions, because I don’t really know’. Rather, they understood the term purely in a practical design context. This was further emphasised by the necessity of abandoning preparation undertaken for the interview (e.g., having website links in response to questions 17, 18 and 19 that were sent prior to the interviews). After the interviews and diagram task, many of the designers wanted to rethink the URLs they had provided because the conversation had proceeded differently compared to their preconceptions.

It was apparent from the interviews that, within design, there is no theoretical construct of interactivity. Despite this the designers perceived interactivity as a new literacy that referred to the practical application of programming as well as knowledge of behaviours associated with functions and users, which was pertinent to web design. Significantly, the designers regarded interactive literacy as essential, but they did not regard actual hands-on coding in the same light. They also believed that interactive literacy empowered them to think differently about communication design and that this new-found knowledge elevated them beyond the practice of graphic design. The evidence highlighted their perception that interactivity and the web had increased the scope of practice as well as the tools available for use.

Interactivity in the daily practice of web design meant working with constraints, which referred back to the knowledge of interactive environments and the potential of the web. The designers criticised clients and graphic designers who did not have the same knowledge as them, and as a result were perceived by the designers as approaching the web with what they called ‘old practices’ and ‘old thinking’. The designers implied that clients hindered innovative solutions, that graphic designers without interactive literacy did not harness the potential of interactivity to facilitate multi-dimensional web design, and that, together, clients and graphic designers obstructed the overall advancement of the web.

The designers discussed user-centric websites that were familiar and intuitive for the user. This was a main topic of conversation in which the designers frequently referenced the web as a human space as well as their role in making it so. When describing how they developed concepts for the web, they spoke of the use of functional conventions to create web design that was intuitive and built on existing user behaviours while simultaneously introducing new ones. They relied on combinations of conventions, cultural codes and narratives to generate new meaning. The idea of a conventional approach to the design aesthetic was objectionable to the designers. Through the conversation, they illustrated their approach to developing new meaning and visual languages by making new technology familiar and intuitive through the use of conventional knowledge.

Evidence suggested that the designers' believed interactive functionality should be invisible and transparent. However, the data revealed that they never spoke of interactive functionality on its own. Rather, they discussed it in conjunction with a visual manifestation – for example, navigation, hyperlinks and transaction functionality – that communicated its purpose within the website. While the interactive features were not the main emphasis of the website, they were spoken of as visual cues that enabled user orientation and operation. Throughout the conversation interactive functionality was discussed as a design problem that the designers sought to resolve and make sense of by normalising it through anecdotes that explained the actions and outcomes of the functions.

The data generated from the interviews highlighted the relationship between the designers and their attitudes to technology within a web design paradigm. The designers combined a mix of analogue and digital methods in the development of web design. The initial stages of the design process involved sketching, conversation and technological play. Their discussions regarding the medium and the message highlighted an amalgamation of the two considerations when developing appropriate design solutions, despite the designers' claim that they considered the message first. The designers asserted that the user was their absolute priority. They used technology in their conceptual and construction process to develop websites that engaged and attempted to forge an emotional connection with the user.

Although the user and the purpose of the website were different entities, one could not be discussed without the presence of the other. They were intertwined. While the designers were clear that their design had a business intent, engaging users in the communication imperative lay at the core of all design projects: 'it's all about leading-edge creativity and leveraging technology, but never forgetting that if it's not designed with people in mind – experiential and engaging and personal – then it's pointless'. The designers implied that the success of a website

is measured through user traffic and response. They were committed to making the web an intuitive space for users to inhabit and accomplish activities unique to each website. In doing so they endeavoured to make the unfamiliar familiar and to ensure usability across multiple dimensions.

The generic attributes of users did not diminish their importance in affecting the purpose and design direction of a website. The ongoing references to the user flagged them as the first priority. The designers felt responsible to ensure their design would benefit the users. While the designers did not explicitly say so, they gave the impression that the user was more important than the client and, to some extent, determined how the communication was delivered. Therefore, the idea of accountability was centred on the user experience, ensuring that they could understand and operate the website. However, while the designers spoke of these methods as making their practice more user-centric, they also spoke of their own empathy and intuition. While they hailed the user as number one, they made design decisions based on themselves as innovators who know what is best for the user.

Interactivity was perceived by the designers as a tool to facilitate new types of communication experiences within web design. The broader practice of communication design focusses on the user, influencing the current shape of the web by making it a more intuitive and human space. Designers spoke of technology as integral to shaping design solutions for the web, despite old sentiments that the message drives the medium. Within web design, the message, medium and user are inextricably linked, with each affecting design decisions and the way the final communication reaches the user.

# 6 | How do designers visualise interactivity?

## 6.1 Introduction

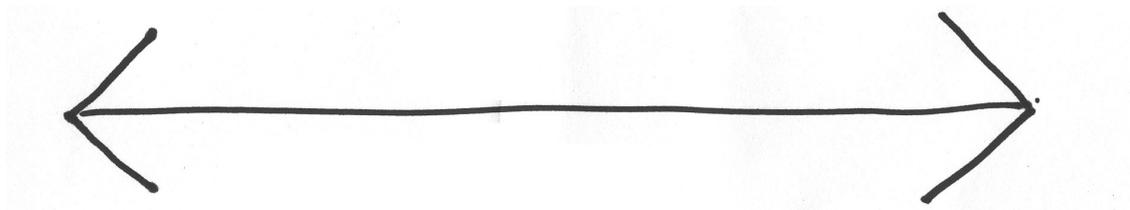
As discussed in Chapters Two and Four, visualising ideas is a core component of design and a process that designers have not relinquished despite the use of digital tools. The importance of visualisation has been likened to engaging in a conversation with oneself through drawing or mark-making, which is an inherent skill for designers. As the literature review revealed that designers were more eloquent when communicating visually than verbally (De Vries, 2010), it was important to include visual methods in this study. In the interviews, the designers commented that much of their initial concept generation began with sketching, scribbling and writing down words on paper, along with a conversation. Therefore, at the end of their interview, the designers were asked to define interactivity visually. In asking the designers to visualise their understanding of interactivity, the research has sought to enable designers to use their intuition and their inherent abilities and skills to communicate their perceptions of interactivity. The aim here was to allow the research subjects to express their views in ways in which they felt most comfortable and which could be produced with minimal intrusion on the part of the researcher.

The most interesting aspect of the diagrams was the diverse ways in which the designers visualised interactivity as a whole, rather than as a series of answers given to questions that focussed on a specific understanding of interactivity. Superficially, the diagrams appeared to lack any commonalities, but on further inspection there were similarities in the symbols and visual language used to represent the designers' perceptions. The diagrams represented a visual manifestation of how the designers understood the multiple roles of interactivity and the web, providing a critical counterpoint to the findings discussed in the previous chapter. Using the same themed sections as in Chapter Five, it was possible to analyse the diagrams collectively and conduct a comparative analysis between the interviews and diagrams. While some diagrams appeared to emphasise attitudes raised in the interviews, others presented other, at times contrary, perspectives on what the designers said.

In this chapter I will first present the diagrams that the designers sketched in the interviews (Figures 6.1–6.9) along with a caption that gives an overall interpretation of each diagram. Further analysis of these diagrams will follow in the subsequent sections. As part of this process I will deconstruct the diagrams and reconstruct

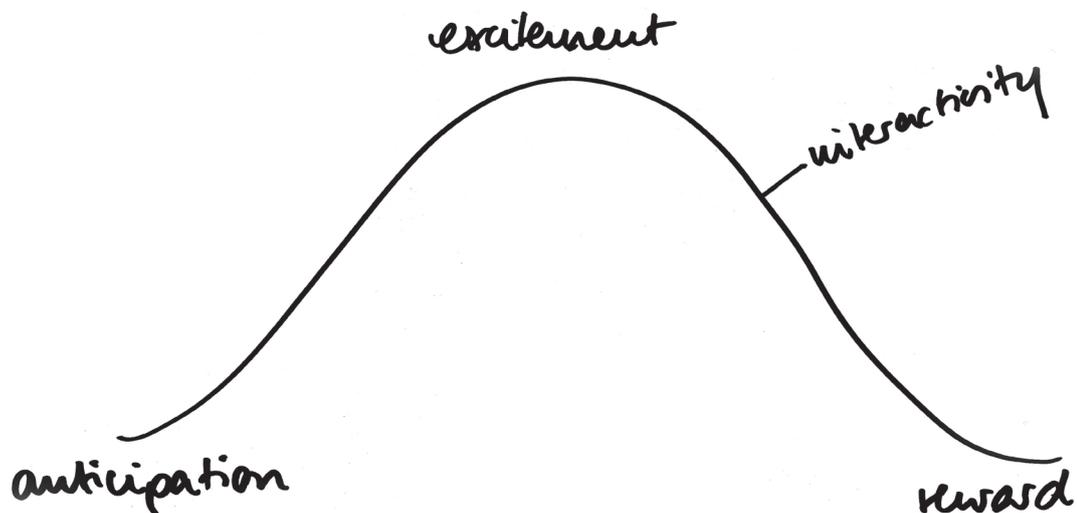
them, bringing together different elements from each for comparative purposes. To do this I will use my own expertise as a visual thinker to interpret and decode the diagrams. Understanding visual language from an internal design perspective, I will be in a position to reveal much about the symbolism and meaning conveyed in the diagrams.

Figure 6.1: Interactivity simplified



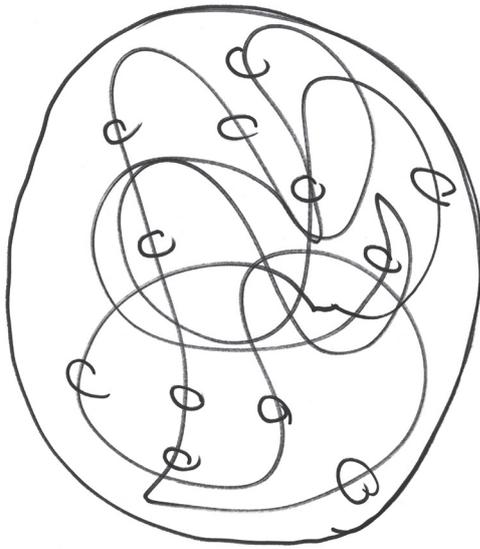
The two-way arrow pictured above is a non-linear representation of interactivity and is suggestive of two-way communication or information flow. The two-way arrow implies connectivity, expediency, efficiency and an element of choice. Figure 6.1 is one of the most simplified diagrams, suggesting that interactivity should be simple, intuitive and seamless.

Figure 6.2: Emotion in interactivity



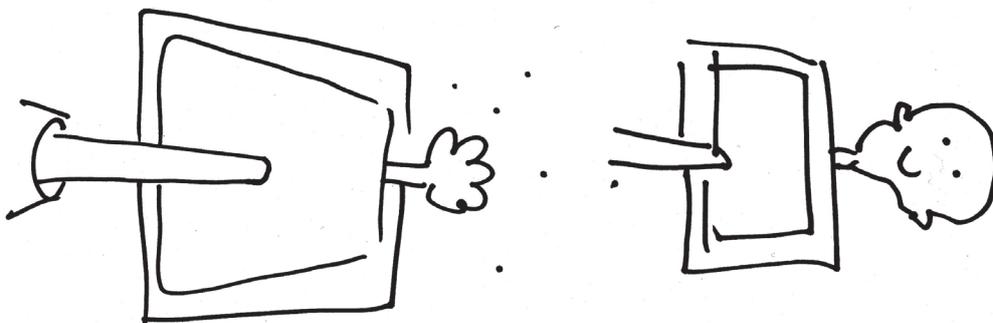
This diagram characterises interactivity as a journey that forges an emotional connection with the users by taking them through a series of emotions that reward them for their perseverance and engagement. This diagram is the only example that references the emotion of the user. It implies that the interactive experience is satisfying in its own right, rewarding the user by motivating them to maintain a deep level of engagement and resembles the flow principle (Csikszentmihalyi, 2002, Polaine; 2005).

Figure 6.3: *Experiential interactivity*



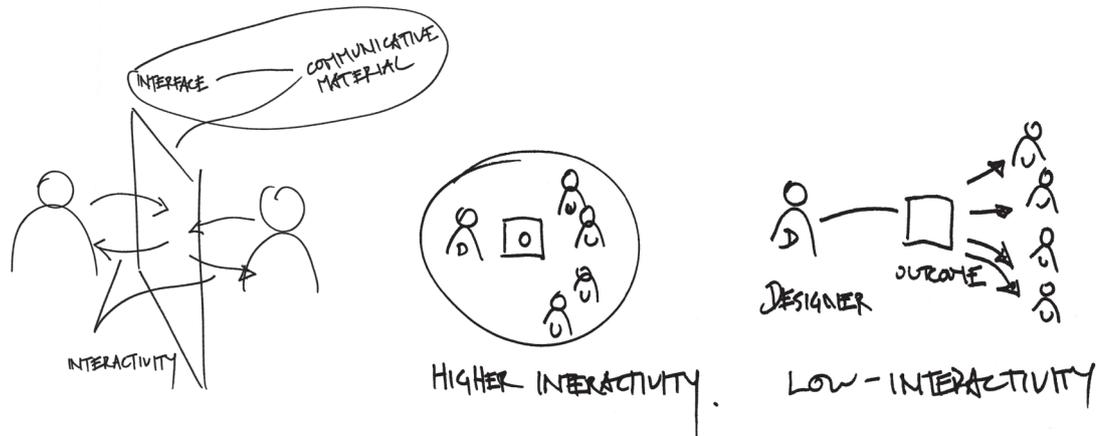
The implied meaning underpinning this diagram is suggestive of a journey and the multiple choices available to the user. It also references the distance travelled by users between websites and the number of encounters that can potentially take place within this immersive environment.

Figure 6.4: *Immersive interactivity*



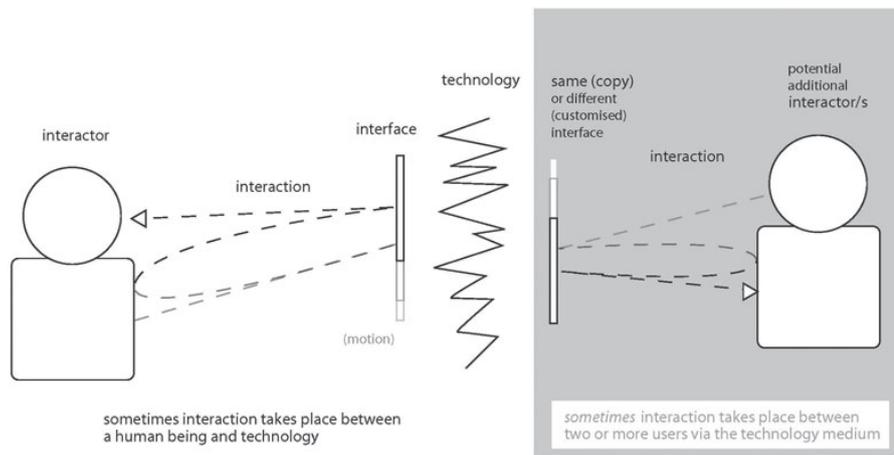
This figure represents how interactivity is immersive, facilitating connections and collapsing time and distance through the web. It demonstrates connections forged between designer and user through communicated content. It could also be interpreted as the connection between business and the user. It also represents embodied interaction and the physicality of the engagement, in which the user is engaged in the act of communication.

Figure 6.5: Levels of interactivity



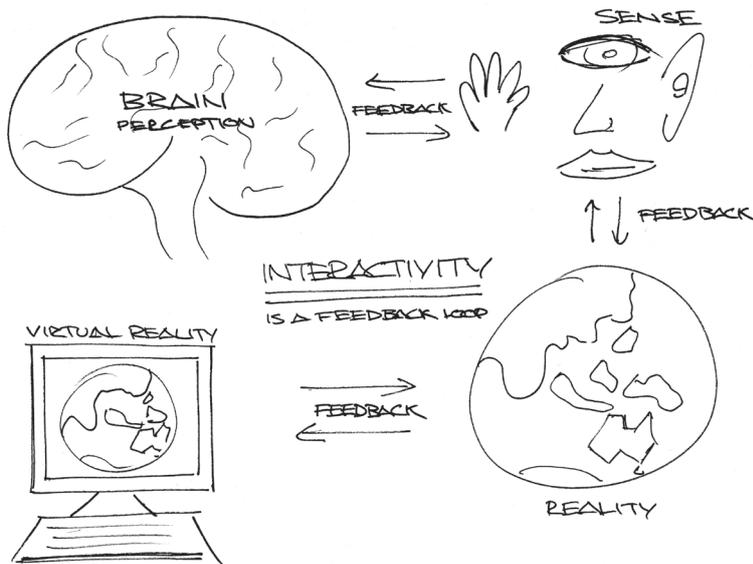
This diagram is divided into three similar diagrams underpinned by connections that enable communication. The main diagram represents interactivity as a face-to-face interaction, via a screen interface. The designer has then drawn two more diagrams in an attempt to explain low and high levels of interactivity. These smaller diagrams represent two distinct approaches to web design: high interactivity, referring to a user-centred approach in which the user and designer collaborate to resolve the design problem; and low interactivity, in which the designer develops an outcome, regardless of the user, to communicate to them. In the low interactivity diagram, the communication is represented as one-way, as in old media paradigms.

Figure 6.6: Interactivity as a definition



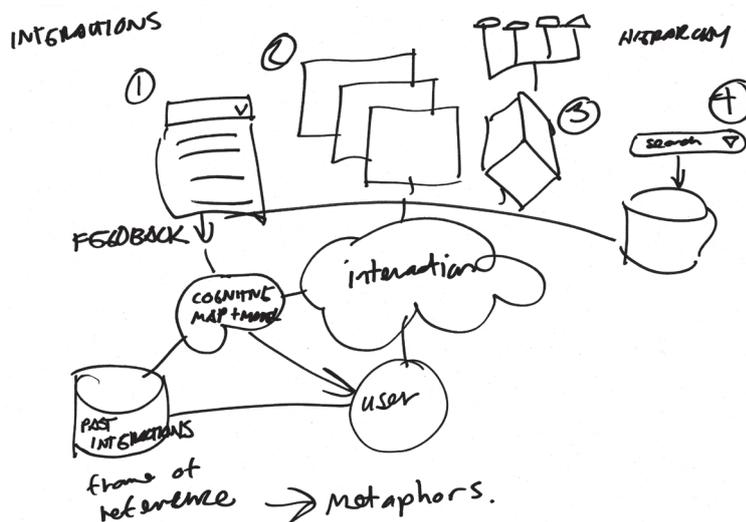
This figure is a visual representation of some of the more scholarly definitions from communications theory that speak of interactivity as distinct phenomena between people, and between people and computers or networks (Stromer-Galley, 2004). Like Figures 6.4, 6.5 and 6.7, this diagram contextualises interactivity within responsive screen-based activity.

Figure 6.7: Interactivity as a feedback loop



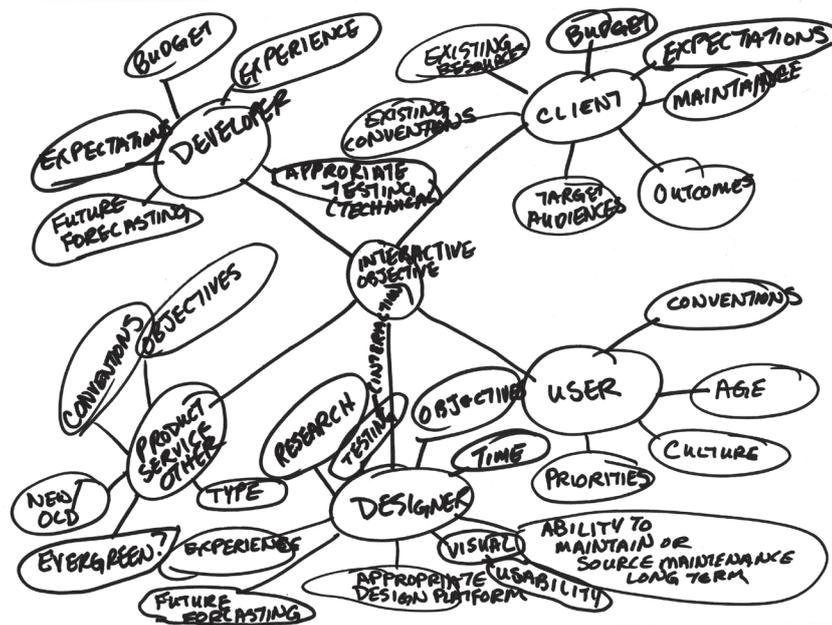
This diagram represents interactivity as a process of feedback. It comments on contributing factors that impact on the shape of interactions on the web and how those factors, in turn, shape society. While the diagram presents interactivity as a loop, it also implies multiple directions and choice. It is suggestive of connectivity facilitated through interactivity, and it presents interactivity as immersive because it simulates the real world.

Figure 6.8: Interactivity that facilitates interaction



In this figure, the designer has used a sitemap – visual language born of the web – to visualise the facilitation of interactivity. This figure highlights the multiple sources of input and collaboration that contribute to the production of an interactive environment. The diagram references the user in the objects labelled cognitive map, past interactions and frame of reference in a framework in which the meaning is easily accessible.

Figure 6.9: Interactivity as a mind map



This figure is similar in style to a mind map, which is common in the brainstorming process used in design. Similar to Figure 6.8, this diagram indicates the multiple contributions from various stakeholders, as well as the complexity of interactivity. It visualises the connections and collaborations within the design process and production, as well as details from a user profile. Significantly, this is the only diagram that mentions expectations from both a client and a developer's perspective.

This section captures initial interpretations of the diagrams. These interpretations will undergo further analysis in the following sections. Throughout this chapter multiple concepts, characteristics and themes will be discussed to gain a deep and rich understanding of this study's visual conversation.

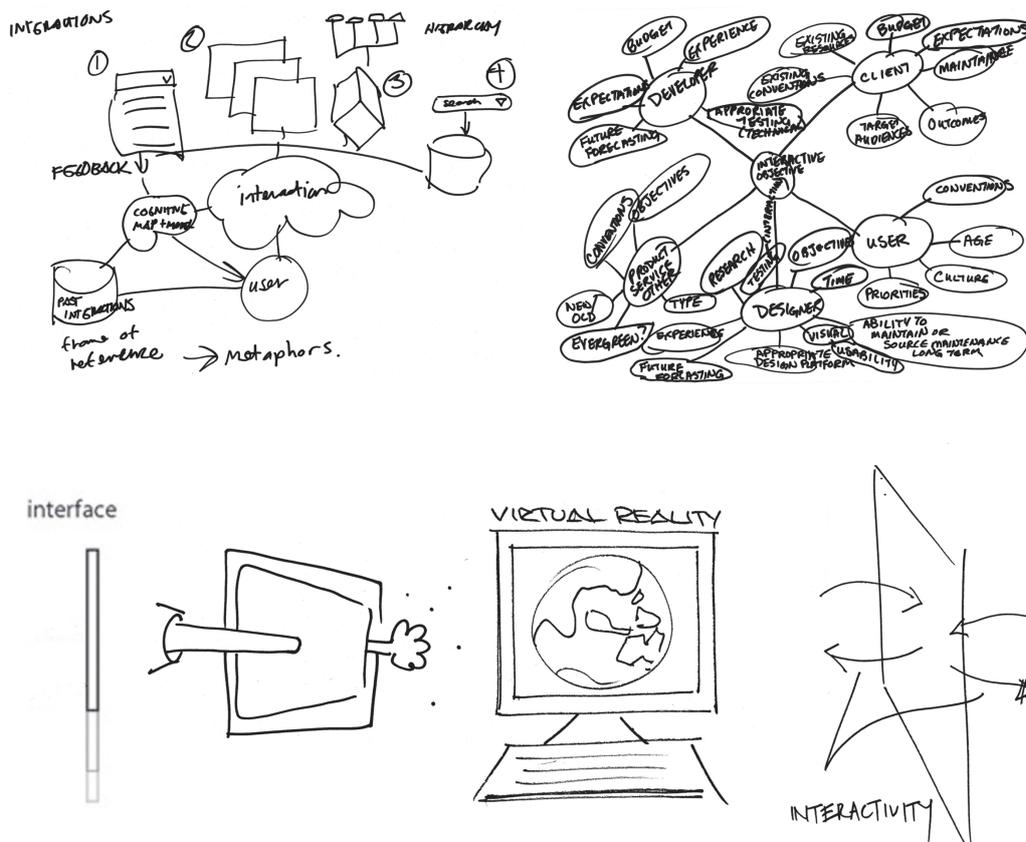
## 6.2 | How do designers visualise interactivity and the web?

Asking the designers to visualise interactivity introduced different perspectives, some of which were not articulated in the interviews. This process also allowed designers to visually express their overall understanding of interactivity. In Chapter Five, two main perspectives of interactivity emerged: first, as an abstract concept and its applicability to the broader practice of communication design; and second, as a reified practice in web design. The designers described interactivity as having synergies with communication design: 'interaction is design and design is interaction'. They also perceived interactivity as a way of thinking about communication. These perceptions, while evident in the diagrams, were not the only ones. Other themes were present in the visuals, including technology, a social context and a sense of presence.

The majority of the diagrams visualised strong metaphors symbolic of the networked technologies, but each had their own unique style of representation. As such, a set of defining characteristics of interactivity emerged that were playful, serious, scholarly, simplified and descriptive illustrations.

A critical difference between the interviews and the diagrams was that, in the diagrams, interactivity was visualised as a more tangible concept than the abstract way in which the designers spoke of the term. The diagrams are much more definitive in linking interactivity to a specific context. For instance, six of the nine diagrams associated interactivity with the web, which was symbolised either by the presence of a computer screen or the use of visual language and terminology inherent to web design, such as sitemap structures. In Figure 6.10, six of the diagrams that used screen or visual language from the web to visualise interactivity have been placed together. Significantly, the figure illustrates that the designers visualised interactivity mainly in the context of the web.

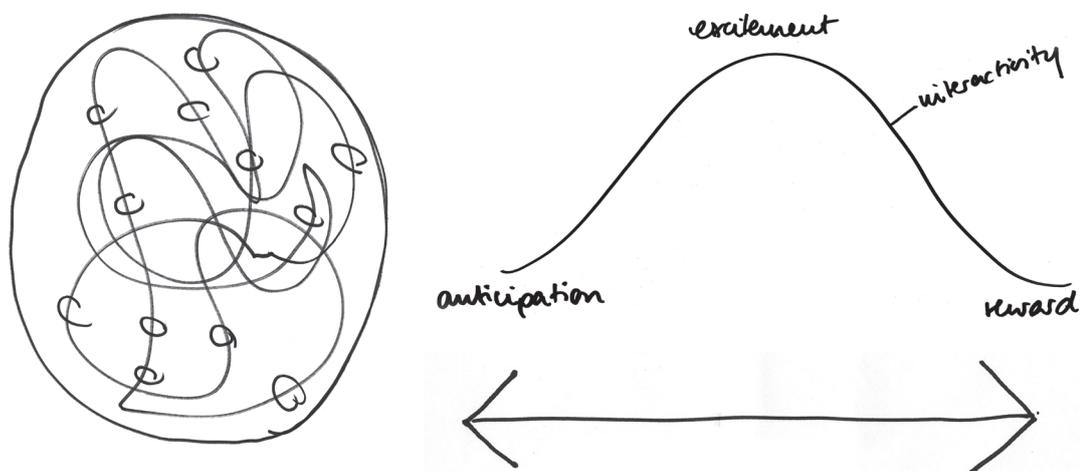
Figure 6.10: Defining interactivity within the context of the web



The remaining three diagrams were more ambiguous in their visualisations. Nevertheless, it was still important to examine them because of their common use of lines, suggestive of the non-linear structures associated with the web. All nine

diagrams made use of line work and directional symbols to represent connection and choice between the various elements. However, the three diagrams in Figure 6.11 represent interactivity solely as a journey, depicting the user moving between different points. If we compare the three diagrams in Figure 6.11 further, the objectives of Figures 6.1 and 6.2 are focussed on the user being empowered and drawn more effectively to different stages, whereas Figure 6.3 represents user exploration without clear objectives, or what has been coined 'surfing the web'. The primary intent of these three diagrams was to communicate movement between and within websites, as well as highlighting emotions that motivated and rewarded the users' decisions and subsequent actions.

Figure 6.11: Interactivity as a non-linear journey

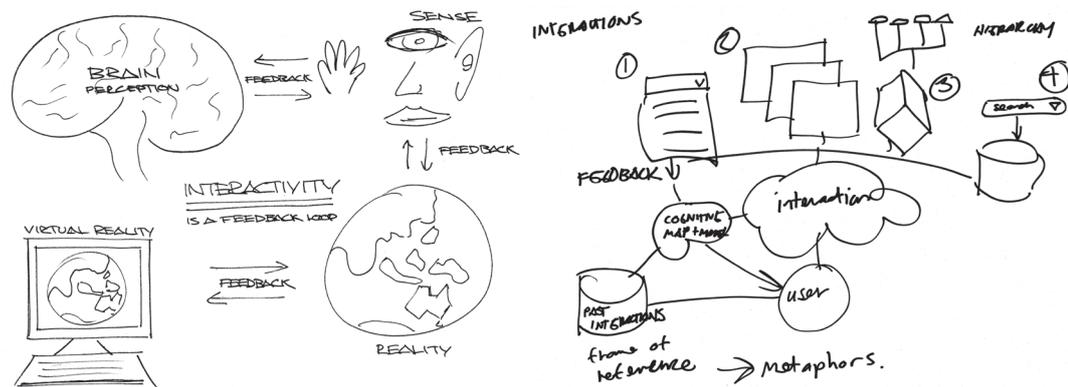


The frequency with which connectivity between people is represented in the majority of the diagrams is significant, especially since it was not explicitly referred to in the interviews. The designers used connective elements as an analogy to explain interactivity as a concept that pervades all aspects of our existence: cognitive, mechanical and physical. Other links in the diagrams connect users to objects, emotions, information systems, the world and each other. Figure 6.12 highlights in green the connections between users, objects, emotions, behaviours and information in the diagrams. These connections directly represent interactivity as a facilitation tool. While the designers did not prioritise connectivity in discussions, the diagrams represent a different picture, showing that the capacity to link users is a critical factor in the designers' perception of interactivity.



alongside arrows that connected the user to the web. Significantly, in both cases the use of the word feedback was associated with user cognition, as can be seen in Figure 6.13. Both examples reference cognition with learned behaviours and the way that these contribute to the interactive experience. Notably, the word feedback did not relate to the verbal feedback that occurred in the user-to-user diagrams (Figures 6.5 and 6.6). Rather, it related to responsiveness – that is, feedback that occurs when the users' actions trigger a reaction.

Figure 6.13: Connecting cognition with interactivity in feedback loop



The idea of a responsive system underpins many of the diagrams, albeit different types of responsiveness. Figure 6.6, for example, uses arrows and lines to convey multiple actions and reactions that occur between the user and the system in a face-to-face exchange. What is apparent in Figure 6.6 is the designer's understanding of the interactive functionality that must occur to facilitate such exchanges. Similarly, for the feedback loop to function in Figure 6.7, the designer implies an operational system in place that enables actions and response. Despite its chaotic exterior, Figure 6.3 depicts an underlying system that allows for multiple paths. The frequency with which the designers implied a level of responsiveness within the context of connectivity is noteworthy, as it relates directly to how they perceive interactivity. While the responsiveness of the web was discussed in the interviews, it was not as all-encompassing as it appeared in the diagrams. Through the use of arrows and repetitive symbols such as dashed lines the designers articulated the multiple roles of interactivity visually and with less ambiguity than the interviews.

The idea of choice underpins the arrows and lines in a non-linear structure. In combination with particular icons and repetition, the line work becomes suggestive of exploration within a multi-layered interactive environment. In the interviews the designers associated choice with user retention, but this was different to the way choice was visualised in the diagrams. If Figure 6.3 is perceived as a website, it is an example of a non-linear experience that provides the user with multiple options and ways of navigating content on a website. If, on the other hand, it is interpreted as a macro view

of the web, the same applies: the user has access to a myriad of networks. Similarly, choice could be interpreted through the two-way arrows and connecting lines that represent the capacity to move from one location to another based on personal choice. Contrary to the perception of boundless opportunities, the diagrams could also be interpreted as representing choice within the narrow parameters of a specific website. Only two diagrams, Figures 6.1 and 6.3 (already discussed), could be interpreted as portraying choice that extends beyond the boundaries of a website. Five figures illustrated interactivity within specific boundaries, whether it be the screen, as in Figures 6.2, 6.4, 6.5, 6.6 (already discussed), and 6.9. The remaining four diagrams, Figures 6.1, 6.3, 6.7 and 6.8 (already discussed) could be interpreted as portraying choice that extends beyond the boundaries of the website, for example by referencing past interactions (such as metaphors) as depicted in Figure 6.8, or the many factors that influence design, development and user-experience.

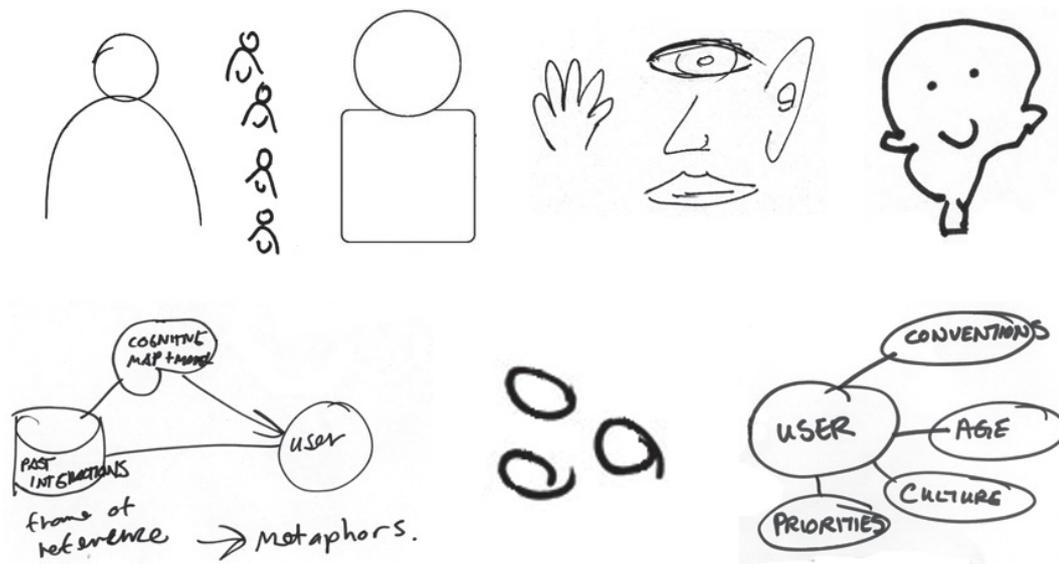
A significant difference between the interviews and diagrams is the contextual framework surrounding the conversations. As mentioned previously, in the diagrams, the designers' perception of interactivity fell within the parameters of the web and was not represented with the same ambiguity as in the interviews. The designers used symbols and visual language that represented the web, web systems and non-linear structures associated with the web. Interactivity was visualised as having multiple roles within the planning, design and production of web design. They visualised interactivity as a systematic process that was both connective and responsive, with fun, quirky characteristics that overlaid the systems and forged an emotional connection with the user. Both aspects, in combination, appear to be critical in operating and enhancing the user experience. The designers visualised interactivity and web design with users as a dominant presence, suggesting that they consider the user in the design of systems and content for the web. On the surface, these diagrams appeared as rough sketches. However, on deeper examination they offered a different point of view from that presented in the interviews, providing additional insight that supported and at times enabled a more in-depth understanding of how the designers perceive interactivity.

### 6.3 | How do designers visualise the user?

The user made frequent appearances in the diagrams, with eight of the nine including diverse representations of people who would populate the interactive experience. These visualisations supported the interview data in which the designers spoke of the user as the main priority. The following section examines the diagrams in-depth to see how the user is illustrated, and to what extent specific knowledge of the user is communicated visually. In particular, I will focus on any identifying details of the user to reveal whether the designers' depictions of them are more than stereotypical.

While the user featured prominently, designers had different ways of representing them. One, for example, pictured the emotions of the user as words (Figure 6.2), while another represented the user's senses (Figure 6.7). Only three of the nine designers gave the user recognisable features. In common, however, was the rough depiction of a figure, suggesting that users *were* present, but only as vague representations, similar to the interviews (as can be seen in Figure 6.14 below).

Figure 6.14: Visualisations of the user



In the diagrams, the caricatures were involved in a process of listening, thinking and speaking that occurs in a social context. Two of the diagrams (Figures 6.5 and 6.6) visualised the user engaged in a face-to-face exchange via the computer in either a real time or asynchronous discussion, while another two diagrams (Figures 6.2 and 6.3) represented an immersive experience. Two diagrams in Figure 6.14 visualised some of the elements that shape users' engagement in interactivity – past interactions, conventions, age, culture and priorities – suggesting that the designers understood the general knowledge and behaviours that users bring to a website. Another simple caricature (Figure 6.5) represented the user with unique qualities, differentiating between users and designers by labelling them with a capital 'U' or 'D'. The diagrams conveyed the users' activity within the website as pivotal to making interactivity function, in a manner similar to the way in which designers spoke of the user: as the main priority.

Three designers visualised research methods and processes in their drawings. Figures 6.8 and 6.9 illustrated the more traditional user-profiling methods undertaken, in which the designers investigated characteristics, language and culture specific to a particular demographic, suggesting that these processes and knowledge informed the preliminary stage of the design process prior to concept

and design development. Figure 6.5, on the other hand, indicated a user-centred approach in which users ('U') and designers ('D') were enclosed in a circle, suggesting a process of knowledge sharing and co-creation. This was the only visual reference to a specific design research method, and it contrasts with the other diagrams. The spontaneity of the diagrams was more suggestive of the informal methods used by designers to profile the user, including gut reaction, office polls, empathy and intuition. The quick visual responses did not allude to any lengthy research processes conducted in the design process. It could be argued that the research process is problematic to visualise, but its omission from the majority of diagrams suggests that it is a process that is not always undertaken.

In summary, the presence of the user throughout the diagrams suggested that users were a main priority for the designers, reinforcing their perceptions of the web as a human space. They illustrated familiar settings in which the user is the central focus of interactivity. While there are no specific references to types of users in the diagrams, there are visual cues that acknowledge the individuality of the user and the unique experience and perceptions they bring to any interactions on the web. Three of the nine diagrams signify that research, in some instances, occurs and informs concept and design direction. On face value, the user appeared simplistic and vague, substantiating findings from the interviews that they were regarded as generic. However, on another level the diagrams further emphasise the importance of users and the knowledge and experience that they bring to a website. The diagrams also intimate that user knowledge in – and the designers expectations of – user behaviour inform the design of the website.

## 6.4 | How do designers visualise the purpose of design for the web?

In this study, designers visualised interactivity in the context of the web. Therefore, it is a straightforward task to identify the purpose of the web as represented in each of the diagrams. Note that the presence of the user in the majority of the diagrams emphasises their influence in establishing the purpose of design for the web. Within the diagrams, the centrality of the user indicates three main points of purpose within design for the web:

- to create connections for and with the user
- to engage the user in communication
- to enable the user to understand and operate the website intuitively in order to achieve the above points.

This section looks at each of these points in more detail, using the diagrams.

Connectivity was highlighted in section 6.2 as a critical attribute of interactivity. Arrows and lines connect users to users, content, systems, products, designers and companies in experiences that vary from no fuss to exploratory. Visual analysis highlights that connections comprise one of the main objectives of the website. Through connections the designers empower the user, giving them autonomy to determine their own path. Yet if, as discussed previously, we interpret the websites as microsites, half of the designers suggest in their diagrams that they construct websites with a level of stickiness to deter users from exiting that site, therefore minimising the connections that extend beyond their website. Figures 6.3, 6.5, 6.6, 6.8 and 6.9, for instance, all demonstrate contained environments that concentrate on connections as the central focus, such as the interactive object the quality of the interaction itself (as depicted in Figures 6.8 and 6.9), or the connections that enable users to interact (as in Figures 6.5 and 6.6). The metaphors used in Figures 6.1, 6.2, 6.3 (depending on context), as well as 6.4 and 6.7, provide a different perspective, in which users are connected to a wider world (as in Figure 6.7), the unknown (as in Figure 6.4), or on a journey where any connection is possible. While the diagrams display an array of connections, common to each is the perception of connections as enabling and, as such, a key purpose of web design.

The diagrams also demonstrate that designers are acutely aware of the relationship between users' online and offline behaviours and experiences, and the ramifications of each on the other. Using metaphors, the majority of the diagrams represent connectivity between the user and technology, best evidenced in Figure 6.4, in which the user is grabbed and pulled through the screen. Similarly, Figures 6.3, 6.7, 6.8 and 6.9 represent a blending of the physical and virtual, as the user is immersed into an interactive environment or a process in which the outcome is interactive. Interestingly, in Figures 6.5 and 6.6 the diagrams signify the simulation of a face-to-face exchange, but the users are illustrated as separate from technology and the screen. In these diagrams the screen is visualised as the interface that enables the connection to occur, differing from the other diagrams in which user presence is interwoven with the language and processes associated with interactivity.

The main intention of the diagrams was to provide the designers with the opportunity to visually communicate their definition of interactivity. An expectation was that the communication imperative would be explicit. Therefore, it was surprising that within the diagrams there were only a few references to a communication proposition, with only three of the nine diagrams explicitly illustrating content. Figure 6.5 contained a heading labelled communicative material, while Figures 6.8 and 6.9 used the metaphor of pages and labelled circles to suggest the communication of content. While the notion of communication was implied in the other six diagrams,

the designers did not use metaphors or visual language that related to the traditional notions of content, such as text on a page. Instead, communication was inferred through face-to-face visualisation or physically grabbing the user. What this highlights is the designers' recognition of the changing nature of communication that has seen content, once delivered as reading material or in a graphic form, increasingly communicated through behaviours, choice, functionality and intangible attributes such as brand values. This is a key concept because it points to the widening scope of communication as an experience that sees users actively engage and interact with the communication as well as system of delivery.

To further explore the designers' perceptions regarding communication within interactivity on the web, it is necessary to reference the interviews, in which the designers position the two concepts as interchangeable. Statements such as, 'what's the difference between communication and interactivity?' and 'interactivity ... is in some ways just a new way of saying communication', demonstrate the perception that communication is implied within a visual definition of interactivity, and explain the minimalist approach to visualising communication in the diagrams. In saying this, however, it must be noted that these statements were more ambiguous than the diagrams that did reference the interaction or interactive object, in which communication was assumed to be a core component. Coupled with the interviews, the diagrams reinforce the notion that communication is implied rather than articulated visually, and echo the way in which design has been documented, whereby the communication imperative was implicitly understood as the primary purpose. In this instance it is helpful to examine the two data sets to gain insight into the complex and changing notion of communication. Evidence from the interviews, along with the diagrams, represents web design as an activity in which communication occurs through tangible elements such as content and connections, and more intangible forms such as dialogue, exchange and responsive systems. The representation of communication is not consistent in the diagrams, but its presence is pervasive and implies purpose.

Figures 6.8 and 6.9 provide the best examples of the complex information system that underpins design for the web. Figure 6.8 visualises interaction as a cloud that is comprised of content, research, feedback, hierarchy, images, user experience, cognition and knowledge. Figure 6.9 visualises the interactive object in much the same way: as a crucible produced through the careful consideration of the stakeholders, expectations, specifications and requirements. Figure 6.7 also visualises the complex factors required – the brain, multiple senses and our place in the world – in order to create an immersive experience that mirrors reality. The remaining six diagrams have been simplified to minimal stylisations, with varying references to technology or functionality. In this way they typify the designers' approach to web design, in

which the emphasis is on engaging the user and creating connections – emotional or otherwise – that both enable the user and communicate across multiple dimensions.

The purpose of design for the web has been represented in the diagrams as creating connections with the user in order to engage and communicate. Fundamental to successful engagement is the underlying system that enables this to occur. A common thread evident throughout the visualisations was a systematic approach. All of the diagrams demonstrated a process that enabled movement, choice and connections, an example being the two-way arrow (Figure 6.1) that displayed a directional system similar to Figure 6.2. While giving an outward appearance of chaos, Figure 6.3 also visualised traffic flow that was contained within boundaries, suggesting a different type of systemisation. Figures 6.5, 6.6 and 6.7 all depicted a responsive process that involved feedback, while Figures 6.8 and 6.9 illustrated the process in which the final interaction or interactive object was developed and produced. Even though the visualisations are diverse, each has depicted a system in which communication is implicit.

Even though I stated that identifying the purpose of web design in the diagrams was a straightforward task, there was considerable complexity due to the implicit representation of communication. While the notion of communication was present, there were very few visual cues that directly related to the communication of content. The lack of detail suggested two things: 1) the designers associate communication with interactivity, and defining one presupposes the other; and 2) communication is implicit within the designers' practice, to the point that they do not distinguish it as a stand-alone element. Based on the diagrams, I argue that the designers endeavoured to connect and engage the user for the purpose of communication. In order to achieve this, they visualised an array of interactive systems that facilitated different types of communication. Therefore, based on the diagrams, the main objectives were to establish a system that enabled users to navigate their own path through a website, and to empower them to make diverse connections through the process of communication.

## 6.5 | How do designers visualise interactive functionality?

During the interviews the designers rarely discussed the technical aspects of interactive functionality – that is, programming or scripting languages – and spoke more broadly of the overall function and intent of web design. The discussion of function focussed on the realisation of a website's purpose and whether or not their design fulfilled those objectives. While interactivity functionality was a key feature in realising a website's purpose, it was described as invisible and transparent. The diagrams displayed a similar approach, implying interactive functionality instead of visualising it. The lack of visual representation of the technical or operational aspects of interactive functionality confirmed

that designers think of it as invisible, underpinning the content or experience. What the diagrams did display, however, was a functional process, discussed in the previous section, that represented the systematic approach the designers used to achieve their purpose within web design. This section examines the representation of interactive functionality from two perspectives: 1) the overall function of a website that was pictured as a whole system; and 2) interactive functionality that remained invisible in the diagrams.

In this study, the designers used marks such as lines, arrows, screens, users and designers to symbolise the function of an overall process or system. In this context the diagrams depicted interactivity as performing multiple tasks that facilitate a functional and responsive system. This is best exemplified in Figure 6.8, which displays all the elements that contribute to an interaction that is responsive and intuitive in all its features, including navigation, content, information architecture, search functions, research and user profiles, as well as two- and three-dimensional media formats. The diagrams were clear in their meaning and demonstrated that quality interaction is the sum of many components working together cohesively to achieve website objectives that motivate the desired response from the user. Based on the diagrams, the designers visualised the system as being integral to realising the full potential of an interactive website. What makes this differentiation complex is that while interactive systems underpinning the website were visualised, the interactive objects and functionality were omitted in the diagrams.

To understand how the designers understand interactive functionality, it was necessary to look beyond what had been visualised to the invisible spaces in the diagrams. If the invisible space is examined, the absence of interactive functionality confirms that the majority of the designers' focus remained on the visual functions pertaining to the overall experience and communication, rather than the programming and coding of the website. Because the diagrams represented interactivity as the overall function of the system, the space between the pictorial elements highlights the idea that interactive functionality was present, enabling connectivity between numerous elements. Moreover, the lack of visual representation further highlights the designers' lack of hands-on involvement in programming for web design.

Figures 6.15 – 6.23 are modified versions of the original diagrams. In these diagrams I have visualised the invisible space, where interactive functionality occurs as green. In doing this I have attempted to make sense of the abstract way in which the designers have articulated the transparent nature of interactive functionality that has been evident in both conversations. It is not my intention in this section to speculate on all interpretations of the invisible, but it is important to identify and report on the blank spaces as critical areas in which interactive functionality occurs and through which the designers reveal much about how their perception and practice involves interactive functionality.

Figure 6.15: Interactive functionality facilitating multiple options

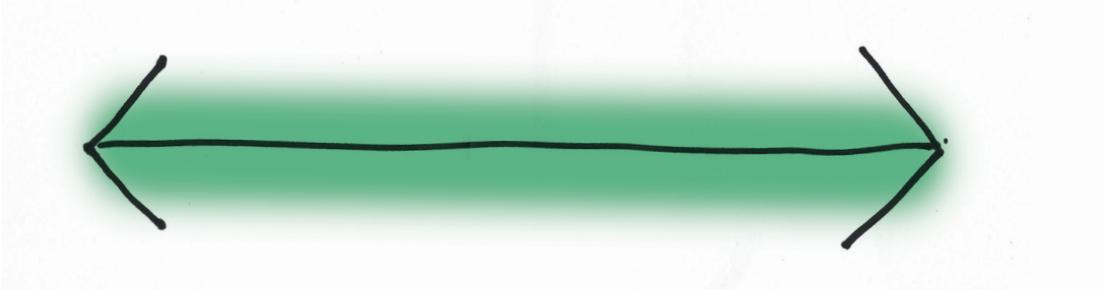


Figure 6.16: Interactive functionality facilitating changing emotional state of user

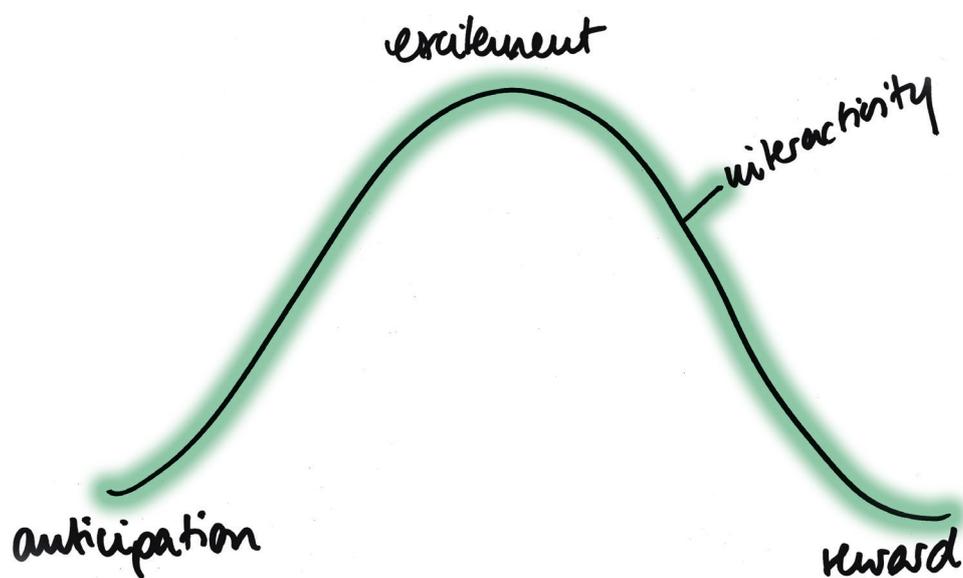


Figure 6.17: Interactive functionality facilitating exploration

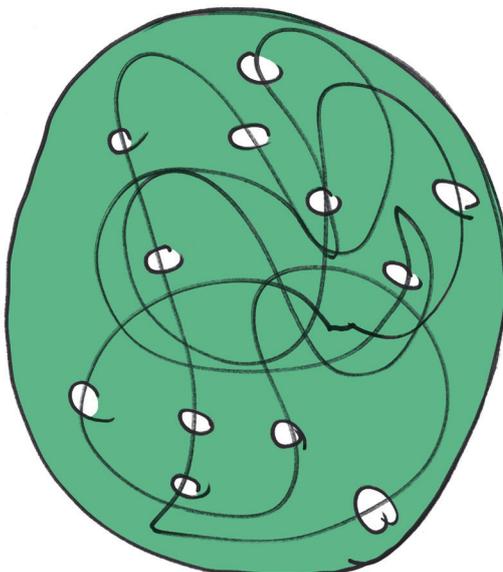


Figure 6.18: Interactive functionality facilitating connectivity and a sense of presence

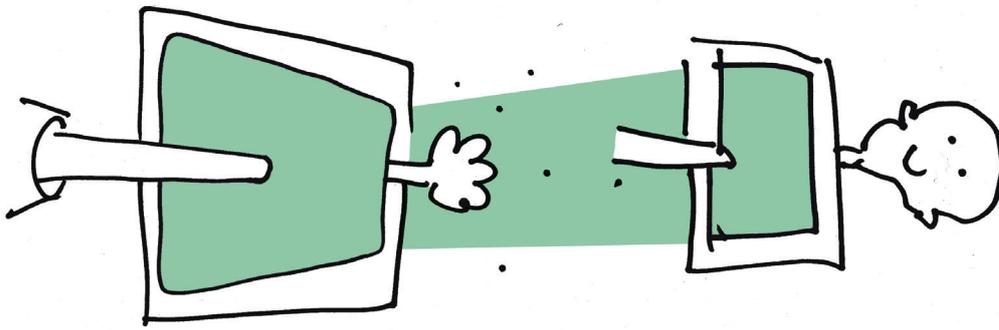


Figure 6.19: Interactive functionality facilitating communication

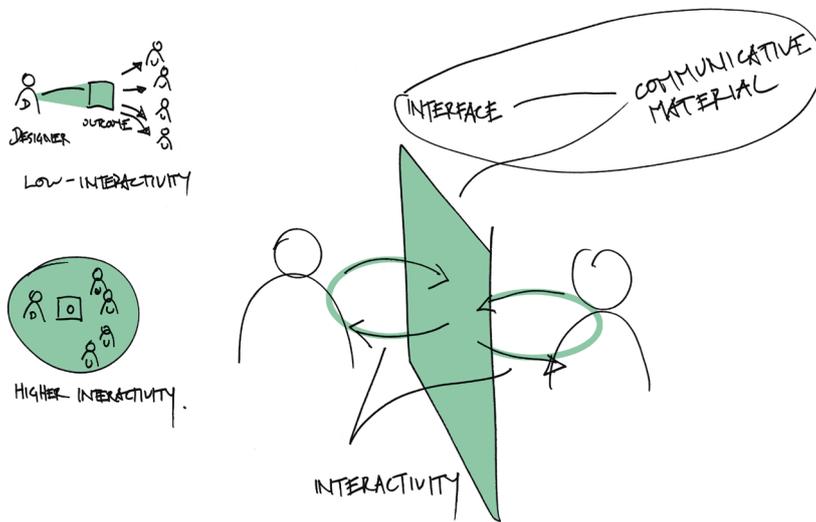


Figure 6.20: Interactive functionality facilitating reciprocal communication and responsive system

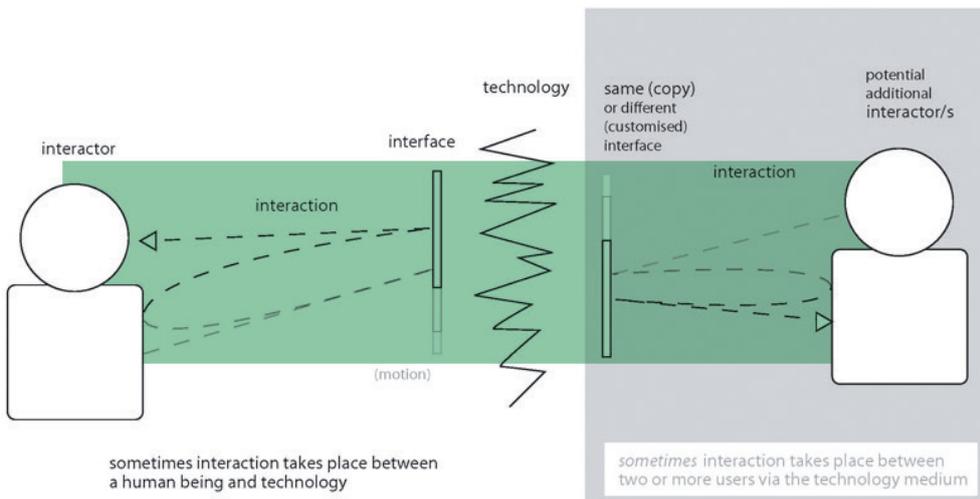


Figure 6.21: Interactive functionality facilitating the intersection of users worldwide through the web

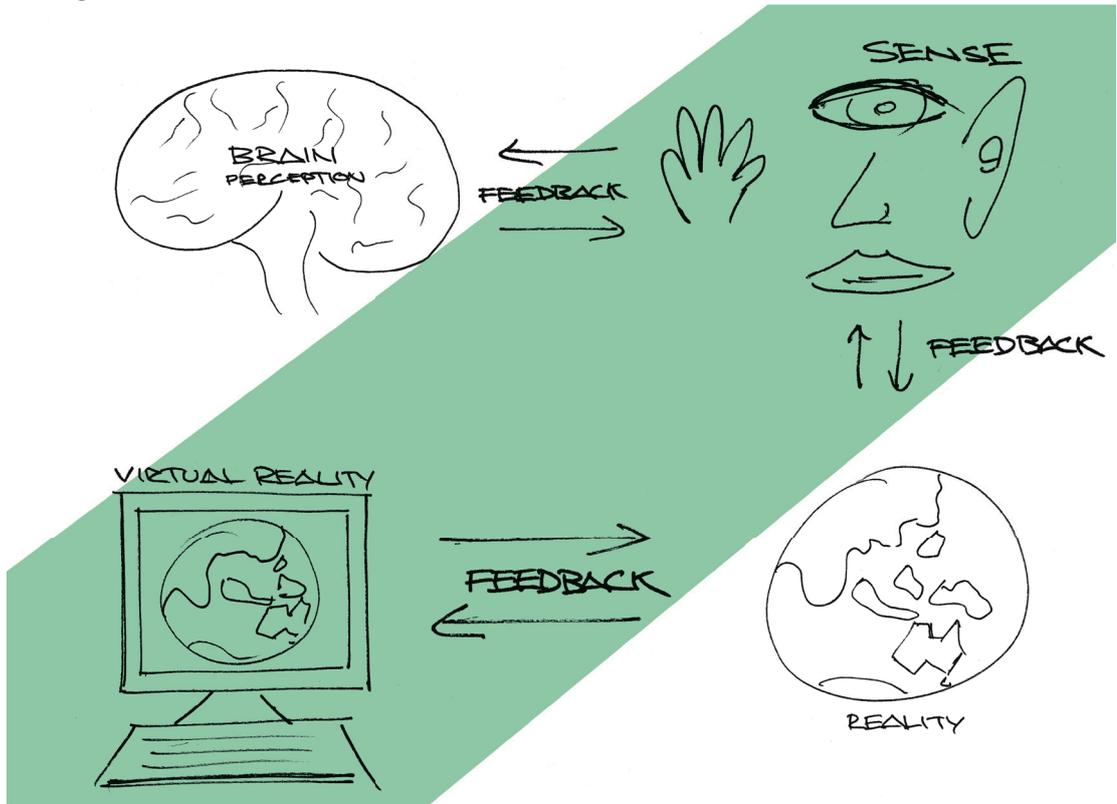


Figure 6.22: Interactive functionality facilitating convergence

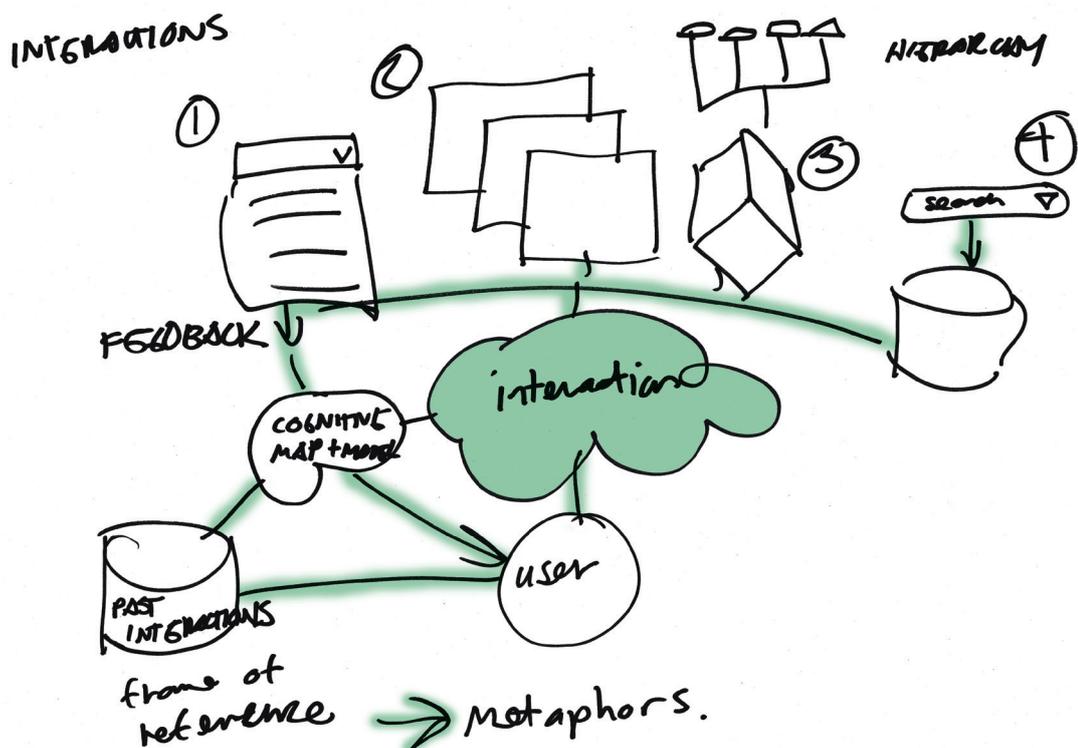
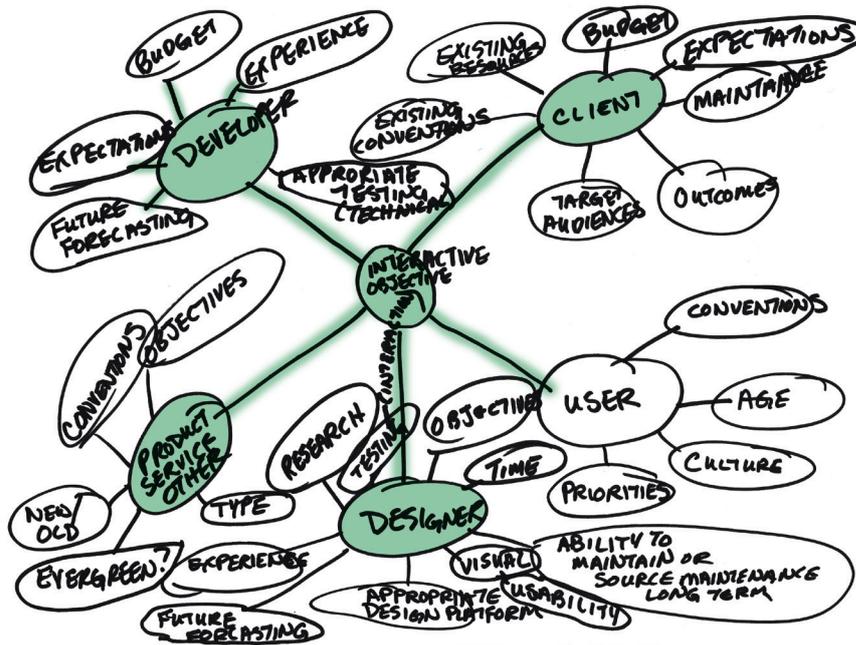


Figure 6.23: Interactive functionality facilitating an infrastructure



One of the key points to emerge across the visualisation is that interactive functionality – a range of technical operations – underpins all of the diagrams. By highlighting the areas where interactive functionality is present, but not visually represented, we can see the operations it performs in order to facilitate the function of the website. Visualising the invisible also revealed the designers’ perception of interactive functionality as a critical operational component that binds the elements of a website together as a cohesive whole. The lack of visual representation also implies that interactive functionality is too broad and complex to visually define and, to this end, the designers implied through their diagrams that interactive functionality was beyond definition – an evolving concept that differed based on the individual objectives of a website.

Interactive functionality is a complex issue that requires differentiation between the various meanings that designers associate with the words function and interactivity. The diagrams show us that the designers visualised interactive functionality as central to the overall function of a system, but they did not illustrate this perception. Rather, they depicted a process in which interactive functionality was implied by white space. The diagrams represented the notion of a functional and responsive system using arrows, lines and figures that portrayed connections, usability, empowerment and communication. The invisible aspects of interactive functionality suggest an implicit understanding that interactive functionality is ever-present in a website that is considered to be interactive. Within the diagrams it could be easy to miss the subtle nuances of interactive functionality due to its exclusion, but by omitting any visual reference, the

designers revealed much about their design practice and priorities when designing for the web. The diagrams conveyed the perception that even though interactive functionality is of primary importance, its implementation lies beyond the designers' role.

## 6.6 | Are the constraints within which designers work visualised?

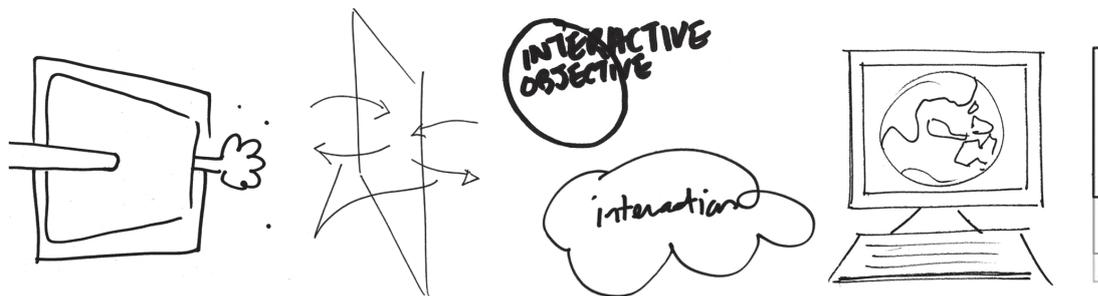
Chapter Five discussed clients, screen representation and accountability issues as constraining factors that hindered designers' practice and the overall advancement of the web. The designers asserted that old media paradigms did little to progress usability and the normalisation of the web. These visualisations presented a different perspective compared with data from the interviews, with only one of the constraints – screen formats – mentioned in the interviews and also visualised in the diagrams. While the designers spoke specifically of the screen's box format, their diagrams did not comment on the shape, but rather focussed on the idea of remoteness and presence. Other constraints mentioned in Chapter Five, such as clients and client knowledge, were rarely pictured in the diagrams, and visual representations of accountability issues were not evident. In this section I will examine the constraints of the screen format and the challenges posed for both the designer and the user.

As discussed earlier, the user is a common figure in the majority of the diagrams, suggesting them as the central focus. Within the visualisations the designers have implied a sense of presence – the figures are pictured in the midst of a dynamic system surrounded by active symbols suggesting choice, direction, actions and reactions. The visualisations represent the users at the heart of the website as though interactive functionality is devised to empower them. However, the designers have also visualised interactivity within a microsite by which the users' decisions and responses are pre-empted. Terms such as 'frame of reference' (Figure 6.8), anticipation, excitement and reward (Figure 6.2) suggest a tailored experience, that the designers have designed to produce a website that will exact a particular type of response and encourage the user to follow a predetermined path.

Manifestations of the screen also featured repeatedly in the diagrams. It appeared predominately as an interface that enabled the users to interact across time and distance. As mentioned above, the combination of screen and user suggested a sense of presence, or being there, that could be construed as both liberating and constraining. Six of the diagrams illustrated the user and screen as separate entities. This implies that the screen interface provides the user with new opportunities, enabling them to connect, participate and communicate, but also that it constrains users by maintaining a sense of

remoteness and obstructing immersion. The representations of the screen also conveyed the challenges designers face in engaging the user in web design remotely, as pictured below in Figure 6.24. The diagrams without a screen presence suggested a sense of being there or immersion. Common to each of them was the notion of engagement. However, it is significant that the screen – perceived as an interface – was represented simultaneously as affording new possibilities, as well as creating new design challenges posed by the new possibilities.

Figure 6.24: Working within a screen paradigm



From the interviews, an image of the client was formed as both an obstruction to the advancement of web design and a hindrance to individual design innovation. This observation was not evident in the diagrams, as clients were seldom visualised, suggesting that they had little involvement in the design process. It could be argued that the client, similar to the communication imperative, was implicit, and as such they did not require a visual explanation. The only diagram to reference the client (Figure 6.9), did not connect them to the design process. Rather, it linked them to the final outcome and was comparable to the other diagrams, which suggested that clients were not perceived as a constraint if they remained remote from the design process. Based on the frequency with which users were pictured compared to the client, this observation links to a point raised in Chapter Five: that designers perceive the user as more important. It also suggests that the main focus of the designers' problem-solving activity is the user's needs, the implication being that they have a better understanding of the user than the client.

Visualisations of the constraints within web design were more definitive and represented differently to those constraints articulated in the interviews. Issues that emerged in relation to the user revealed the challenges designers faced in designing websites that created a sense of being there, that connected with the user remotely. While the screen and the notion of presence were perceived as an opportunity that afforded new ways of communicating, this also posed new challenges for the design process in terms of overcoming remoteness and creating

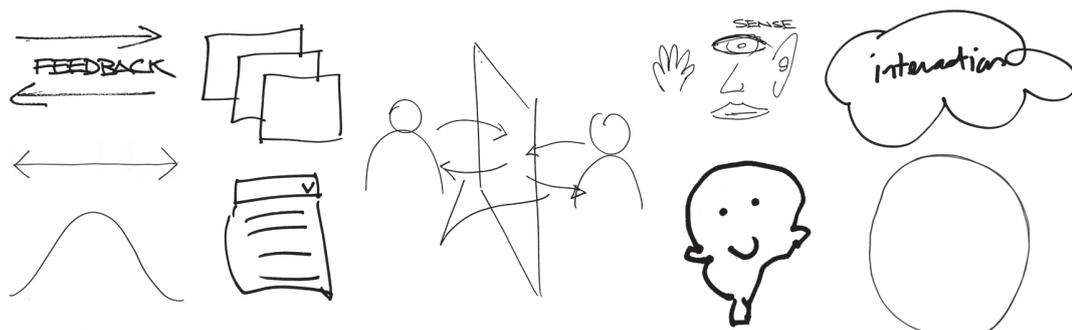
immersive environments. The diagrams were free from the anecdotes and banter associated with the interviews. As such, they provided a more simplified view of interactivity that did not dwell on the constraints, instead representing an entire process in which any challenges were more or less implied.

## 6.7 | How do designers visualise web conventions?

The symbols that the designers used to visualise web conventions were common with the majority of diagrams using familiar icons to suggest motion, direction, information hierarchies, navigation, interfaces and the user. One diagram referred to conventions as a word. While the web is still considered new, it was apparent that the visual language used to describe the web had become synonymous with particular web conventions. The diagrams demonstrated diverse approaches to design for the web, but involved similar interactive characteristics, such as non-linearity, responsiveness, immersion, choice and exchange. The visualisation of conventions was straightforward and, unlike the interviews, there were no illustrations representing conventions in a positive or negative light. This section reports on how conventions were visualised as familiar metaphors that normalised interactivity within the context of the web. It also explores the establishment of visual conventions unique to the web.

A problematic issue associated with the early web was the inability to imagine or visualise the new networked space, let alone the activities it afforded. The web was an unfamiliar concept and, as such, beyond most people's frame of reference. What is compelling about the diagrams is how the designers succinctly communicated a complex concept that was interwoven with human experience and that has been described as both invisible and visible. The designers used everyday symbols and metaphors to define interactivity and the web visually, as can be seen in Figure 6.25. The designers used iconography including arrows, paths and documents, thought bubbles, face-to-face communication, figures, clouds and circles to communicate a concrete understanding of interactivity.

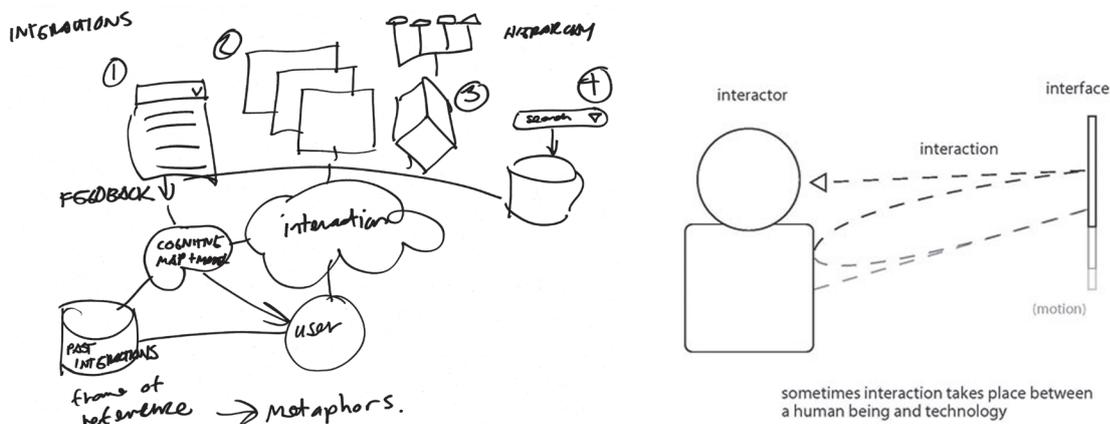
Figure 6.25: Familiar visual language



Of interest in Figure 6.25 are the objects that tell a story that centres on the everyday and surrounds the user. For example, the line from Figure 6.2 has had the words taken away and now symbolises a heartbeat. The cloud represents a thought bubble and, similarly, the circle represents an event or an object. Pages refer to book pages or an information hierarchy, while the dropdown menu represents the contents page of a book. The diversity of the illustrations is in keeping with the interviews, in which the designers discussed interactivity as a multi faceted concept within a social context, but the illustrations interwove the connections between interactivity and the human experience more acutely. Through these diagrams, interactivity was represented more as a concept that is firmly fixed within our everyday existence.

While the familiar iconography in Figure 6.25 has been used to describe what has been considered an elusive concept, the context of the visualisations placed interactivity within a framework that used imagery synonymous with the web to describe its functions. These functions included navigation, sitemaps, information hierarchies and screen interfaces. They are pictured below in Figure 6.26. Also depicted in the diagrams were the visualisations of web characteristics including non-linearity, responsiveness, engagement, playfulness, immersion, synchronicity and asynchronicity. It is apparent from the diagrams that the elements and attributes visualised were considered to be web conventions, resulting from an emergent visual language unique to web design. For example, the layering of documents has come to be associated with information architecture and content-rich web sites, and it is also suggestive of navigation. Pull-down menus are also unique to the web, as are the arrows in the pull-down tab. Over a rapid period, icons used in everyday life have been reassigned new meaning in relation to the web to describe its functions, structures and processes.

Figure 6.26: Visual language born of web design



The designers visualised interactivity in distinctive styles, which typified a conventional approach to design, in which they construct unique experiences. Despite their eclectic visualisations, there are similarities that can be identified. For example, the designers all considered the whole process of interactivity, and did not narrow their focus to just one aspect. Even Figure 6.1, which depicts multi-directionality, can be interpreted as a characteristic present in all aspects of interactivity and the web. From this perspective, the diagrams suggest that there are web conventions that are applicable to the functionality and behaviours of a website. The use of conventions, however, did not extend to design aesthetic in the diagrams, as highlighted by the individual responses of the designers.

As a collective, the diagrams are bold and definitive, suggesting solid and concrete ideas. Key observations that surfaced while examining web conventions were the heavy use of pre-web metaphors to describe and normalise interactivity. Much of the visual language used to define interactivity has now become associated with the web. The designers used familiar iconography in order to communicate their ideas clearly and without ambiguity. In visualising the diagrams there was no hesitation and, unlike the interviews, the designers' thoughts were transformed into a coherent visual within seconds. The ease and clarity with which the designers undertook the task highlighted the way they approached design, whereby they visualised their thoughts in order to make sense of the information. It was apparent that their approach to design had changed little since the web first emerged, and that the convention of sketching and 'having a conversation with oneself' had been maintained.

## 6.8 | How do designers visualise concepts and design for the web?

The diagrams typified how the designers visualised concepts and developed design solutions. They were a design task similar to those found in professional practice. The diagrams represented the first stage of ideation, in which the designers mapped out quick responses that communicate a rough definition of interactivity. In this study the iterative process did not extend beyond this stage. If it had, each diagram would have formed the basis of an iterative process of reflection, thinking and redrawing until it communicated the idea concisely.

As discussed previously, the common thread running through the diagrams was the design of a system or process within the dynamic environment of the web. In order to understand how designers visualised concepts and design for the web, I will examine the following: 1) the diagrams as concepts, mapping the designers' visual definition of interactivity; and 2) the sum of the individual components

within the diagrams that communicated the purpose of commercial web design. As the diagrams have been discussed extensively throughout this chapter, there will be some overlaps with previous sections. However, this section uses the diagrams to isolate individual approaches to ideation and design for the web.

Viewing the diagrams as nine separate concepts, the designers visualised their ideas in simple, decisive line work. They presented a diverse array of ideas, and demonstrated a clear approach to the way in which the designers designed for the web. In completing this simple visual task, the designers were able to communicate the types of experiences they tried to create, injecting their diagrams with humour, credibility, organisation and seriousness. The visual data demonstrated the purpose of the web as connecting, engaging and empowering the user in reciprocal activity. Interestingly, the tone of the diagrams illustrated the interactive intention of the designers' individual approach to web design, as discussed in the interviews. This is not to say that designers used the same approach for all web design however there were particular objectives discussed in the interviews that were reflected in the diagrams. The interactive goals of each of diagram can be listed as follows:

- Figure 6.1: Streamlined experience
- Figure 6.2: Sensory / immersive experience
- Figure 6.3: Explorative / immersive experience
- Figure 6.4: Sensory / immersive experience
- Figure 6.5: Communication / responsive experience
- Figure 6.6: Communication / responsive experience
- Figure 6.7: Sensory / responsive experience
- Figure 6.8: Streamlined / responsive experience
- Figure 6.9: Streamlined / responsive experience

If the interactive objective was to design and develop a streamlined and efficient website (as in Figures 6.1, 6.8 and 6.9), then the design approach most likely to be prioritised would be one that was intuitive, responsive and enabling in both the aesthetic and interactive functionality. Alternatively, if the objective was to engage users in an exploratory and immersive website, (as in Figures 6.2, 6.3, 6.4 and 6.7) the design considerations would focus on creating an experience in which the boundaries between the screen and the user evaporated. By simplifying the diagrams into two descriptive words that explained the interactive intentions, the primary considerations behind each concept and design approach were revealed. Based on their objectives, the designers were able to develop characteristics, values and attributes that enhanced and supported the interactive intention.

As discussed earlier, the diagrams visualised design for the web as a process that involved users and associated tangible elements – such as content, technology, computers and designers – and non-tangible elements – such as non-linearity, interactive functionality, systems, organisation and hierarchical structures. What was fascinating about the numerous components contributing to web design was that no one element stood out as more important. All of the elements were considered to have equal priority. Section 6.3 described how the user was the designers' main priority, and posits that without the user the website fails to function. As such, the user becomes one of the major design considerations required to create a successful website. In this way the designers visualised interactivity and design for the web as human-centric rather than as a technological definition.

A number of the diagrams reflected the enormity and growing scope of communication design, as well as the increasing number of non-designers involved in the design process. Figures 6.5, 6.8 and 6.9 all visualised other contributors in the diagrams. Figure 6.9 named stakeholders – including developers, financiers and forecasters – as well as the clients. Figure 6.8, on the other hand, alluded to many contributors through visual language that referred to content developers, programmers and three-dimensional animators as well as designers. From another perspective, Figure 6.7 commented on the growing scope of web design through its reference to the world and the simulation of reality. With strong visual cues to an expanding practice, the diagrams visualised design for the web as collaborative and dynamic, drawing attention to a process that was the sum of many parts.

Even though their diagrams were materialised with a quick reflex action, the designers visualised their concepts with acuity. The line work was direct and communicated concrete definitions of interactivity as well as the interactive intentions underpinning each diagram. They epitomised the way in which designers visualise concepts: as a representation of an idea that forms the basis of further investigation and development. The notion of interactivity was anchored within the web, providing a fixed context for their definitions. The designers visualised their process, the elements they considered, and the contributors. They communicated in a straightforward tone that implied a preference for simplification and a no-nonsense approach to achieving their purpose. The reference to collaboration was critical. Through collaborative design processes with non-designers, the diagrams suggested the evolution of shared ideals and a clearer articulation of their design process.

## 6.9 | Conclusion

The most compelling aspect of this study was the ease with which the designers crystallised their diverse and at times contradictory, perceptions of interactivity into a single black and white diagram, which in most cases clarified much of what was discussed in the interviews. The diagrams presented interactivity as a reified concept within the web domain and, while they were open to interpretation, they were less ambiguous when compared with the interviews. The following section summarises the findings from the diagrams, highlighting significant themes for further examination in the website analysis. While I do not intend to compare the differences between what designers say and do in this section, I will raise points for comparison at a later stage in Chapter Eight.

The diagrams demonstrated that the designers considered interactivity from two main viewpoints. The first viewpoint saw interactivity as the manifestation and realisation of an information system that users could access and then interact with. The second viewpoint saw interactivity as an invisible infrastructure that underpinned an information system and facilitated numerous interactions. The diagrams imply that the designers are more connected with the visual manifestation of the system and were not as involved with the development of the website's interactive functionality (the invisible component). It was this invisible aspect of interactivity that came across as quite abstract in the interviews, but in the diagrams, although still invisible, the images implied its presence in the blank spaces and clarified how the designers had been discussing it as a boundless proposition. Within the diagrams interactive functionality could be interpreted as limitless, however, it occupied the space around the image, suggesting that its parameters were context dependent.

The presence of the user and other human-oriented symbols reinforced the designers' categorical claims that the web is human-centric. All of the diagrams that visualised a system, experience or exchange pictured the user as the centrepiece of the dynamic process. Interestingly, the diagrams did not provide any additional insight into the user, nor did they allude to the methods used to understand the user. Nevertheless, engaging the user appeared to be a main priority, and any constraints that hindered user engagement were perceived as challenges to be overcome in order to enhance the user's experience. Another important point raised in the diagram analysis was the social context in which interactivity operated. The diagrams involved individuals, pairs and groups of people in a variety of exchanges that exhibited the designers' perceptions of interactivity as operating within a social construct.

It was apparent from the diagrams that the designers sought to normalise interactivity using familiar icons to explain the term visually. The diagrams were anchored in everyday imagery, including arrows, line, figures, paths and screens, as well as other objects depicting interactivity as a narrative rather than a high-level concept. The drawings also successfully highlighted the multiplicity of interactivity and how the various functions it performed overlapped to create a whole. Based on the types of icons the designers drew, interactive objectives were identified as displaying qualities that were considered responsive. By restricting their time and tools for this task, the designers had to think quickly about how best to convey interactivity visually. It was interesting, therefore, that they combined everyday imagery alongside interactive metaphors to create a visual language that was applicable and descriptive of a concept that has so far eluded an easy definition. Even though the diagrams were highly individual, they all depicted interactivity as a comprehensive term that intersects with everyday life.

The frequent presence of the computer screen or metaphors relating to networked technologies highlighted the synergies between technology and communication design. Within the diagrams the computer assumed many roles. It was visualised as a unit through which design could be displayed, a system that users could interact with, and an interface that facilitated connections between designers, users and business. Although design outcomes were not explicit in the diagrams, it was implied that interactivity involved a combination of design principles and technology, and that designers had to consider both areas carefully along with the user.

Collaboration was indicated in the diagrams through the references to developers, user-centred methods and the symbolism of computers, to which users were connected. While the technology was obvious, the diagrams gave the impression that the designers were concerned with the overall interaction, leaving the management of the finer detail to others in the process. Using the diagrams the designers communicated the increased scope and changing nature of design, whereby communication on the web includes technical knowledge, design knowledge, user information, collaborative processes and the capacity to manage development and production.

Significantly, the diagrams provided additional insight into the designers' understanding of interactivity. Reviewing the diagrams alongside the interviews, the visual task was revealed to be a critical inclusion because it allowed the designers to summarise their thoughts succinctly. After analysing the diagrams, it seemed as though the interviews had provided a platform for the preparatory banter that accompanied any conceptual development. The interviews were full of stories

and comments that appeared to skirt around a definition of interactivity. It was only in the diagrams that the designers contextualised the concept within the web domain and defined it as a practical concept that was tangible and made sense within the practice of design. There were differences between what designers said and drew. While the diagrams were informed by the conversation in the interviews, based on the data generated from the diagrams, there is an overwhelming impression that the designers were more concise in their visual conversation. It is in the diagrams that they stripped away ambiguity and communicated with clarity.

# 7 | How do designers employ interactivity in web design?

## 7.1 Introduction

Chapters Five and Six showed how designers understand interactivity to be both an abstract and a very specific concept that not only underpins design for the web, but also extends beyond its parameters to include matters such as user behaviour and cognition, site functionality, and design. All of the designers in this study indicated that their primary purpose in employing interactivity was to create an experience that was relevant for users while also communicating with them. The designers believed that interactivity required a visual manifestation in order for a user to comprehend and operate the functions within a website. In this chapter I will present an analysis of several websites that were designed and produced by the designers. I will also explore the multi faceted concept of interactivity, with its diverse roles in design and development, to discover whether the designers' avowed intentions and expectations were implemented within web design.

The designers were asked to provide websites in three categories: commercial sites they had designed, self-initiated or pro bono sites they had designed, and websites not designed by them that they considered inspirational. The designers identified 47 websites: 18 commercial, 14 self-initiated or pro bono, and 15 inspirational. All sites were then reviewed, using a structured protocol based on ideas and themes that emerged from the analysis of the interviews and visualisations in order to systematically record observations and map them against findings from the visual and verbal conversations. Using different categories of websites enabled comparative investigation of what designers say and what they do. The results from this investigation are presented using the thematic structure from Chapters Five and Six, with particular emphasis on the way that designers implemented interactivity in web design. The broader meaning of interaction, which was frequently referenced in the interviews and diagrams, is also reviewed.

## 7.2 | What are the main factors of interactivity evident in the sample websites?

The main findings from the website analysis are presented in figures throughout this chapter. To conduct an analysis of the websites, a protocol tool was developed to help identify instances of interactivity in each website. From the interviews, 30 factors of interactivity were highlighted, which were grouped under six themes. The themes

and factors that emerged after the data analysis show how the designers perceived interactivity, and the manner in which they visualised it in their diagrams. What is obvious from the website analysis is that while some of the themes and factors were not necessarily interactivity per se (such as metaphor, for example), the designers discussed them as an element that enhances an intuitive and responsive interactive environment. This section examines the factors first and then explores the overarching themes encompassing these factors, the findings of which will be discussed in subsequent sections of this chapter.

To analyse the employment of interactivity in each website, a checklist of questions was drawn up, which was based on the themes and factors that emerged from the data collected by the interviews and diagrams. These questions, which were asked for each website, revealed which factors were evident, and how their combination made the website more or less intuitive, responsive, communicative, enabling or experiential. Below is the checklist of themes and factors, along with their corresponding questions.

### Intuitiveness

- **Navigation:** Did the website have a navigation system that enabled users to see and understand the structure of the content? Did the navigation provide pathways to access that content?
- **Metaphor:** Did the website include visual features or user actions that drew metaphorically on experiences occurring in the physical world?
- **Usability:** Was the website easy to use?

### Feedback

- **Email links:** Did the website provide the email addresses of designated representatives?
- **Telephone contacts:** Did the website provide telephone contacts of designated representatives?
- **Two-way dialogue:** Did the website enable a reciprocal exchange between users and/or designated representatives, either in real time or asynchronously?
- **User-to-many:** Did the website facilitate functions enabling the user to distribute a message to multiple users?

### Responsiveness

- **Action/Reaction:** Did actions trigger reactions in the website?
- **Immediacy:** Was the speed of functions on the website fast?
- **Functionality:** Did the website perform as the functions intended?

## Experience

- **Brand:** Did the website contain any brand identification?
- **User-centric:** Did the design make it easy for the user to understand the content and functionality of the website?
- **Immersion:** Did the boundaries between the digital and physical evaporate?
- **Exploration:** Did the website require investigation to reveal its purpose?
- **Playful:** Did the website involve an experience which sought to engage users through unpredictable and playful design elements?
- **Transaction:** Did the website involve an experience in which users transacted business (buying, selling or equivalent)?
- **Emotion:** Did the website actively solicit emotional responses from users as part of their experience of the site?
- **Persuasion:** Was the use of design, language and functionality deployed in order to activate the user to undertake a specific action?
- **Information:** Did the website enable the user to engage in information gathering?
- **Promotion:** Did the website promote a product, service, brand or individual?
- **Community:** Did the website encourage like-minded users to engage in specific activities?

## Communication

- **Product:** Did the website communicate about a product or set of products?
- **Service:** Did the website communicate about a service or system?
- **Awareness:** Did the website attempt to make users aware of a social issue?
- **Brand values:** Did the website communicate about positive attributes of the brand?

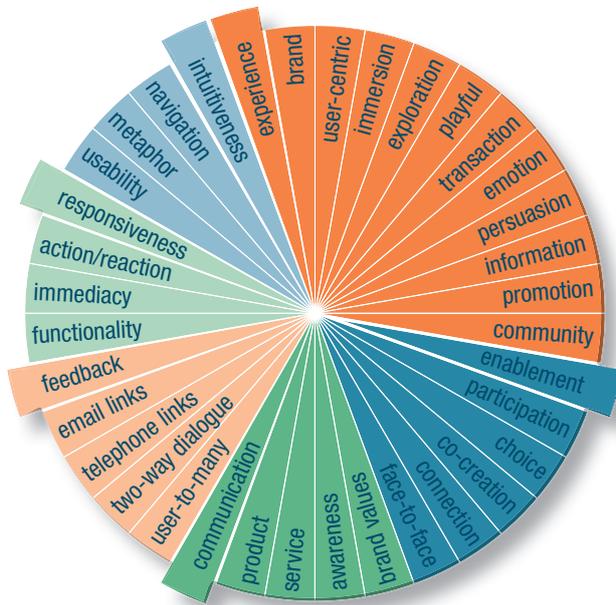
## Enablement

- **Participation:** Did the website encourage user engagement and retention?
- **Choice:** Did the website allow users to create and follow an individually chosen pathway through the site's content?
- **Co-creation:** Did the website provide the capacity for users to contribute to the website through co-creation of content?
- **Connections:** Did the website facilitate meaningful and relevant connections for the user within the website?
- **Face-to-face:** Did the website include features that enabled users to engage in a real-time exchange using video technology?

Figure 7.1 represents a visual profile of the themes and factors evident in the websites in this study. Percentages were based on the number of factors in a theme. For example, the theme of intuitiveness was comprised of three factors, while the theme of experience was comprised of eleven factors. In essence, the factors equate

to those design considerations that emerged from the interviews and diagrams. It is therefore interesting that the theme with the maximum number of factors was experience, demonstrating that this theme was a priority for the designers.

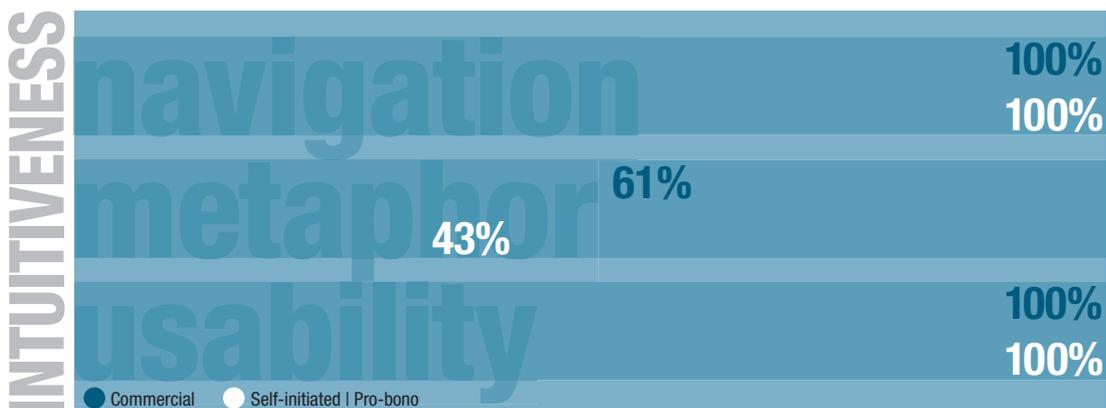
Figure 7.1: Profile of the sample websites



The main findings for each theme are presented below in Figures 7.2–7.13. Within each of these figures, findings are broken down into the two categories of commercial, self-initiated or pro bono websites. For each theme the results for specific factors are presented in one graph, while the aggregated findings are presented in another. In each figure the percentages shown represent yes answers to the questions asked of each website.

Figure 7.2 highlights how the level of intuitiveness was rated in the commercial, self-initiated and pro bono websites. For the purpose of this study, intuitiveness refers to the ease and speed with which a user can comprehend and access the website’s structure and the content of the website.

Figure 7.2: Factors constituting the theme of intuitiveness



The findings summarised in Figure 7.2 indicate that navigation and usability were evident in both the commercial, self-initiated and pro bono websites. Navigation provided an overview of the content structure and possible pathways that the user could use to move through the website. There appeared to be two types of navigation: 1) conventional navigation, which used interactive metaphors such as buttons, drop down menus and home pages to enhance usability through familiarity; and 2) less conventional navigation that relied on metaphors that simulated an embodied experience central to the concept and design of the website. Significantly, where there was a less conventional approach to navigation, designers used more obvious cues to create a sense of presence, such as pop-up books, trees that grew leaves as users left comments, and metaphorical postcards. They also used these as a usability tool, guiding the user by using familiar objects and behavioural association. Variations in the data were recognisable in the types of metaphors the designers used, with Figure 7.2 highlighting that they employed more usual interactive metaphors in commercial projects so that there would be continuity between websites, enabling the user to transfer their knowledge from one website to another.

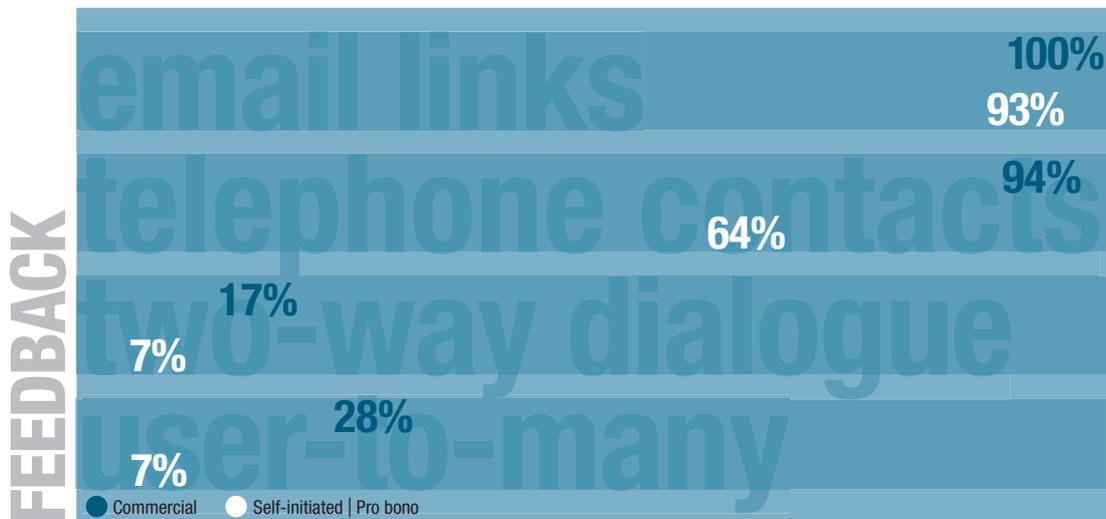
Figure 7.3: Focus on the theme of intuitiveness



As can be seen above in Figure 7.3, intuitiveness was a significant theme, and was characteristic of more than 80% of the commercial, self-initiated and pro bono websites, meaning that the purpose of the websites was clear, with easy access to content and interactive functionality that was also easily understood and easily operable. Interestingly, the commercial websites appeared to have more intuitive environments when compared with those websites developed by the designers as self-initiated or pro bono projects.

Figure 7.4 presents the findings which allowed assessment of whether feedback was present and identifiable in the websites studied. For the purpose of this study, feedback refers to an exchange or dialogue that could occur in the following models: user-to-user, user-to-designer, user-to-company, user-to-product or user-to-system.

Figure 7.4: Factors constituting the theme of feedback



The findings suggest that the designers assumed that email would be the primary means by which feedback was enabled. All commercial websites had links to designated emails and the majority listed telephone contacts. It could be argued that neither email links nor telephone listings are interactive. However, because these appeared as the primary method of feedback in the website, it was necessary to include them as factors. Additionally, the data raised questions about the extent to which the websites facilitated authentic two-way feedback. Notably, the commercial websites provided more methods through which a dialogue could take place. Nevertheless, the evidence highlights that facilities for the user to engage in two-way dialogue were a low priority within the commercial, self-initiated and pro bono websites.

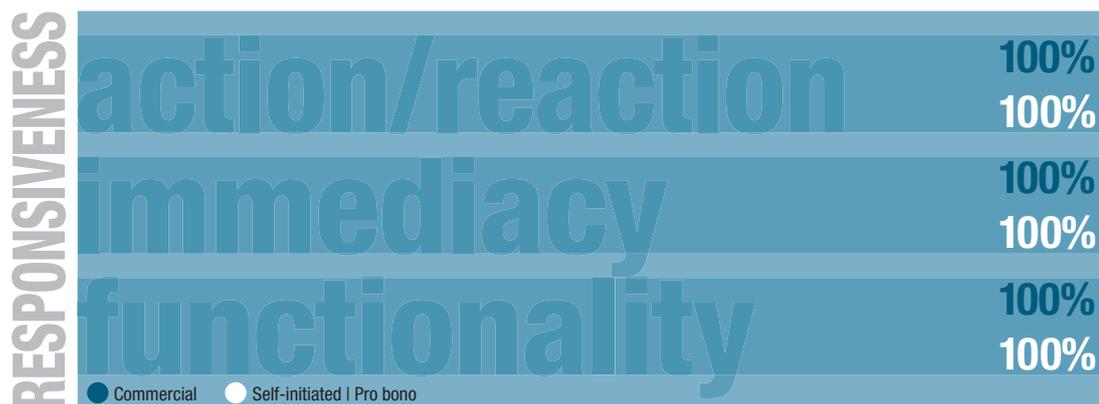
Figure 7.5: Focus on the theme of feedback



Figure 7.5 illustrates that feedback in the commercial and self-initiated or pro bono websites occurred, but was not considered a main priority when compared with the theme of intuitiveness. The commercial websites displayed interactive qualities that allowed for feedback, as did the self-initiated or pro bono websites. The percentages refers to the questions for which yes was the answer. This figure was higher in the commercial websites because of the frequency of email links and telephone contact lists that enabled more traditional dialogues, as opposed to those facilitated by interactivity in web design.

Figure 7.6 presents the factors used to assess whether the websites were responsive. For the purpose of this study, responsiveness refers to a sequence in which actions triggered a response (for example, clicking on buttons resulted in a changed state on screen). If the result did not occur immediately, there were visual cues as to what was happening, for instance a loading message.

Figure 7.6: Factors constituting the theme of responsiveness



Responsiveness was evaluated at 100%. The percentage refers to the questions for which yes was the answer in all factors – action/reaction, immediacy and functionality – shows that responsive features were critical within commercial, self-initiated and pro bono websites. The sample websites highlighted the fact that responsive qualities helped users to orientate themselves to the websites’ functions and features. Responsiveness was a theme whose factors contributed to the infrastructure that underpinned a website as well as the interactive features that users could engage with. Figure 7.7 highlights that the theme of responsiveness as a crucial component in web design.

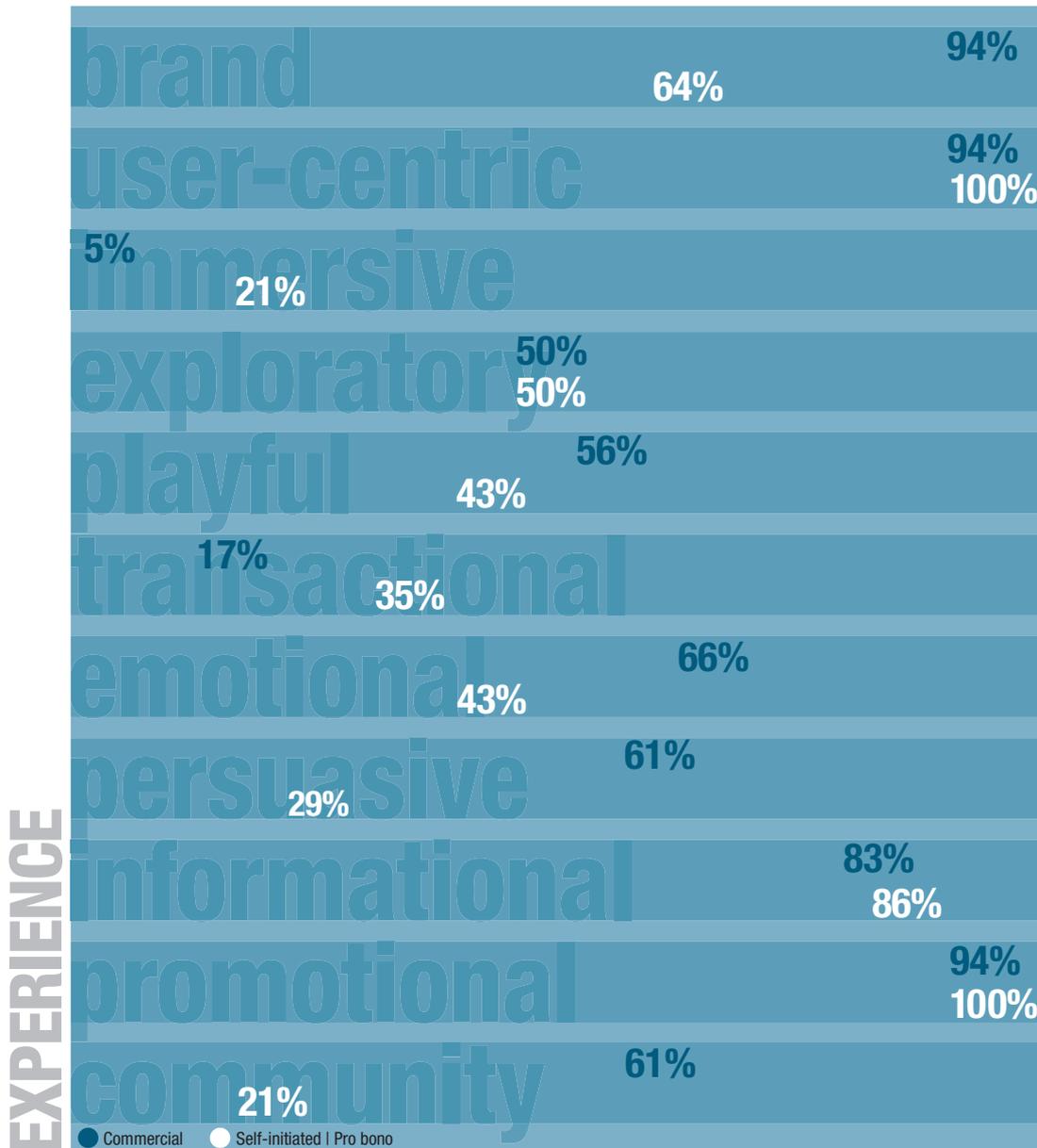
Figure 7.7: Focus on the theme of responsiveness



Figure 7.8 presents the findings regarding those factors relevant to the experience of a website. For the purpose of this study, experience refers to the attributes and tone of a website that contribute to the overall experience. The types of experiences discussed in the interviews and visualised in the diagrams were diverse and

gave rise to eleven factors. Many of the factors overlapped in the websites, demonstrating that the overall experience was comprised of many parts.

Figure 7.8: Factors constituting the theme of experience



Measuring the type of experience was the most difficult task because there were numerous characteristics contributing to the types of experiences evident in the websites. The consistently high values for brand, user-centric and promotion indicate that these factors underpinned the intentions of the majority of the sample websites. Nevertheless, the ways in which the designers achieved these objectives varied, because

the sample websites displayed different approaches to promoting a product, service or brand, depending on whether it was playful or serious. An example of a playful approach was an educational game about water conservation in which playful and immersive graphics, coupled with interactive functionality in the same tone, were employed in the game to discourage water wastage. Another more serious company website promoted its services and knowledge using extensive content, including self-authored articles on technological issues and futures thinking, positioning the members of the company as thought leaders. Therefore, while brand, user-centric and promotion were obvious components of the websites, other factors also played a role in enhancing their authenticity and credibility and contributing to the overall experience.

Variation between the commercial and the self-initiated and pro bono websites was the most dramatic within the experience theme. Based on the findings, the self-initiated and pro bono websites concentrated more on the user and were less concerned with a branded experience. Although the self-initiated and pro bono websites were promotional, they were not always closely aligned to brand identification. These websites were also more transactional, but were not overtly persuasive.

Finally, these findings highlight differences in the ways that designers regard the notion of community. Historically, web communities have been associated with chat rooms, forums, discussion boards and face-to-face discussion. Of the commercial websites examined in this study, 61% targeted like-minded users, but, referring back to Figure 7.4, there is little evidence of two-way dialogue or user-to-many models that could enable users to build communities.

Figure 7.9 shows that commercial websites were more likely to include factors that produced an experience for the user when compared to other kinds of websites. While there was a range of characteristics that contributed to an experience in the self-initiated and pro bono websites, the range was not as diverse as in the commercial websites.

Figure 7.9: Focus on the theme of experience

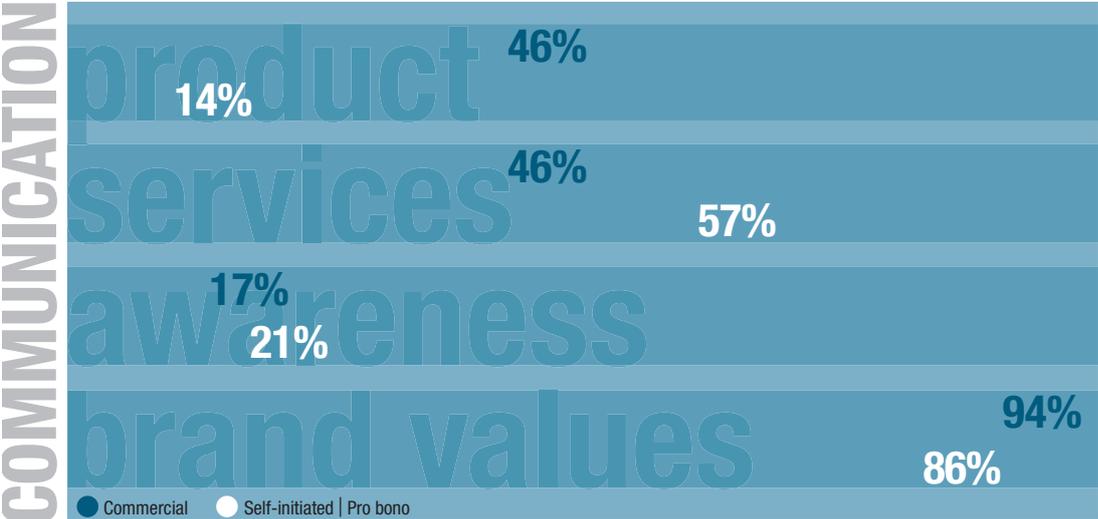


The data presented in Figure 7.9 differs dramatically from the data for the themes of responsiveness and intuitiveness. It is important to remember the diversity of

factors within this theme, and the overlapping characteristics. For example, asking whether the site was immersive highlighted other factor, such as exploratory, playful and informational. Similarly, asking if a website was persuasive usually took into account its purpose, the use of emotional language, its imagery and the type of content. Against the backdrop of intuitiveness in Figure 7.3 and responsiveness in Figure 7.7, it would be easy to surmise that designers prioritised intuitiveness and responsiveness over experience, but this would be misleading. Within all of the sample websites many factors worked together to create a whole experience. Based on the high percentages of intuitiveness and responsiveness, it could be suggested that these were the expectations of an interactive website. The diversity of characteristics that contribute to the type of experience, it could be argued, position experience as the designers main priority.

Figure 7.10 summarises the types of communication evident in the websites. Factors involved are the communication of products, services, social awareness issues and brand values. In contrast to those aspects of communication that were covered in the theme of feedback, this dataset reflects the communication imperative of each of the websites: what the website is communicating and the overall purpose of the communication.

Figure 7.10: Factors constituting the theme of communication

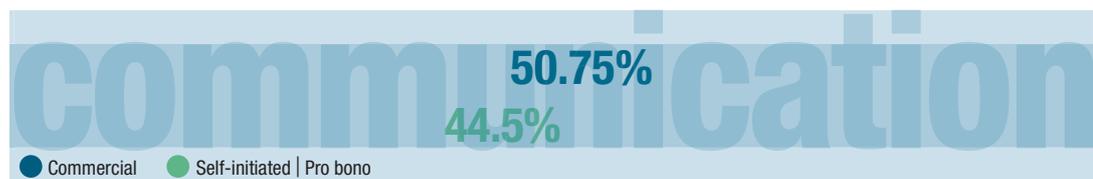


It is evident from the data that there were primary and secondary forms of communication occurring in the websites. While the sample websites were promoting the attributes of a product or service, or awareness of a social issue as their primary communication, content and design were also vehicles for delivering brand values. The data revealed that the communication of brand

values is communicated through traditional modes (information, persuasive headlines, communication or feedback channels) as well as more ephemeral methods relating to factors incorporated in the themes of, intuitiveness, feedback, responsiveness, experience and enablement.

While the primary objectives of communication – promoting a product, service or social awareness – differed between the two categories of websites, they shared the common objective of delivering brand values. While Figure 7.8 shows that the brand experience was not as evident in the self-initiated and pro bono websites, Figure 7.10 shows that all websites had high percentage of answers yes to the questions regarding the delivery of positive brand values. This discrepancy emerged because many of the self-initiated and pro bono websites were not communicating a brand per se. Rather, they were promoting a social cause or a service of an individual or group without an identifiable brand mark, and encouraging a specific type of response. Figure 7.11 shows the overall comparison between commercial and other designed websites in terms of the degree to which they explicitly attempted to communicate with users.

Figure 7.11: Focus on the theme of communication

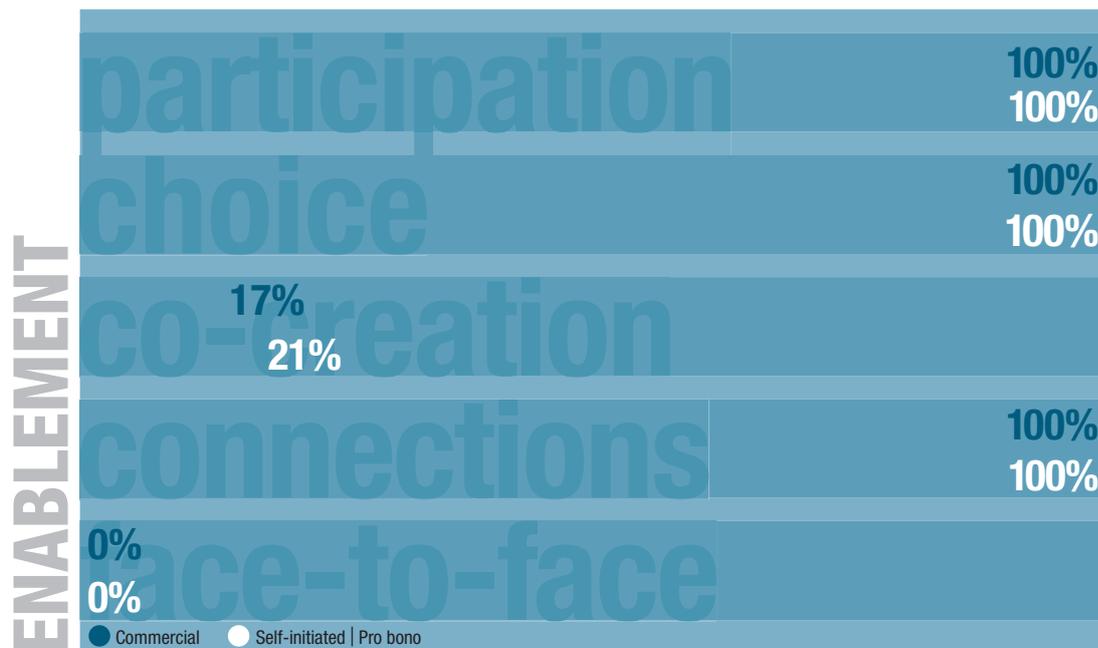


Similar to Figures 7.4 and 7.8, Figure 7.11 presents communication as a theme that focusses on the variety of communication types present rather than whether the websites communicated effectively. To this end, Figure 7.11 demonstrates that all the websites that the designers had developed had a communication imperative, but also that the intent of the communication varied. For example, the self-initiated and pro bono websites were more concerned with the communication of a service as opposed to the commercial websites, for which the central focus was the communication of a product and its relevant brand values. Within these services, some included a content management system (CMS) that the designers had developed for sale or distribution to their clients.

Figure 7.12 highlights how the theme of enablement was rated within the websites provided. For the purpose of this study, enablement refers to the empowerment of users by equipping them with the tools they need to respond to the website and its content. The websites all enabled users to participate and choose their own path through the website. There were ample actions that connected the users to different sections and different information on the websites. The variations in the data are seen

in those factors that enabled users to contribute to the shape, form and content of the website, or to engage in a face-to-face discussion. When comparing the findings in Figures 7.8 and 7.12, it appears that designers maintained a level of control over websites in order to achieve the desired response from the user.

Figure 7.12: Factors constituting the theme of enablement



It is clear that enablement was a top priority in the design of these websites, although, as discussed above, it appears that particular types of enablement were more appropriate for commercial web design. The data shows that video conferencing involving face-to-face exchanges was seldom used in the websites that designers developed. Evidence of co-creation was present, albeit sparse, and as a factor it was rarely present in commercial, self-initiated or pro bono websites. Figure 7.13 presents a comparison of the commercial, self-initiated and pro bono websites highlighting marginal difference in how the sample websites enabled the user. In both categories, enabling the user in multiple ways was a high priority for the sample websites.

Figure 7.13: Focus on the theme of enablement



In summary, it was apparent from the findings that interactivity was the key to the designers' approach towards concept and design development for the web. As a practical concept, interactivity is embedded within all the themes and factors, performing multiple and diverse roles within each area. The results provided by the protocol tool highlighted the fact that interactivity is employed to achieve two main objectives: first, to design a system that is intuitive, responsive and that enables the user, which simultaneously communicates using functionality, behaviours and content; and second, to create a unique experience whereby familiar characteristics are deployed interactively in order to engage and empower users. The data appears to reveal two layers of interactivity that are considered in web design, which work in conjunction: the functional side, which is mandatory and ensures the system works; and the more individual side, whereby an experience can occur, forging an emotional connection with the user.

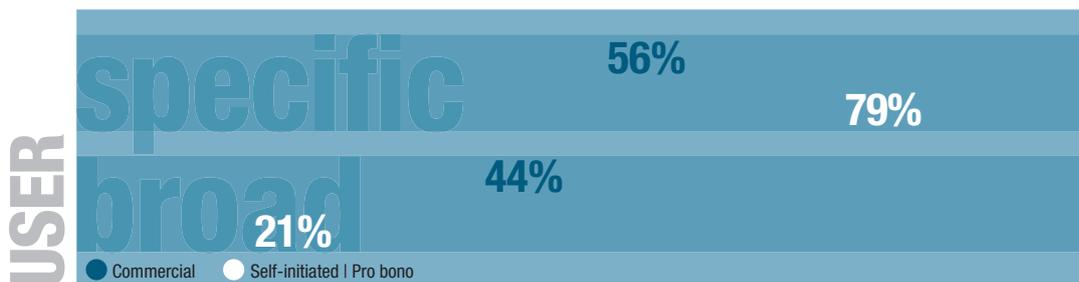
Significantly, the website analysis revealed the complexity of interactivity in web design, and reviewed how it performed different roles and functions that overlap. Despite this complexity, the websites also highlighted how interactivity could be used as a systematic tool when implemented in ways that simultaneously engage and empower the user in a communication experience. Within the commercial, self-initiated and pro bono websites, the implementation of interactivity seldom allowed for the user to engage in face-to-face exchange, co-creation or the redistribution of messages. This finding suggests that the designers still regarded the user as a receiver, albeit one that is actively engaged by navigating through the content and responding to the functions and behaviours of a website. The under-utilisation of authentic feedback, such as two-way dialogue, suggests a very specific employment of interactivity within commercial web design, which differs from the way the designers spoke of and visualised interactivity. In the following sections the inspirational websites that the designers cited will be included in the analysis. It is important, however, to note that the majority of these websites were not overtly commercial, but were instead more experimental. In the context of this study the inspirational sites appeared to align more closely with the designers' thoughts on interactivity compared to their implementation of it.

### 7.3 | Who are the users of the sample websites?

Asking whether the user can be identified was a straightforward task and, based on the evidence from the protocol tool, a clear picture of user groups emerged within each of the websites. In some instances the user was very specific, as in the water conservation website discussed previously, where the user was clearly defined as

school children (15–17 years of age). In other websites it was apparent that the designer was targeting a broader audience. Interestingly, when a specific primary user was identifiable, a secondary audience could also be recognised. Therefore in the protocol tool, two questions were asked with regard to the user: 1) can the user be identified as a specific demographic? and 2) are the websites designed to attract a broad user group? The findings are shown below in Figure 7.14.

Figure 7.14: Identifying user groups



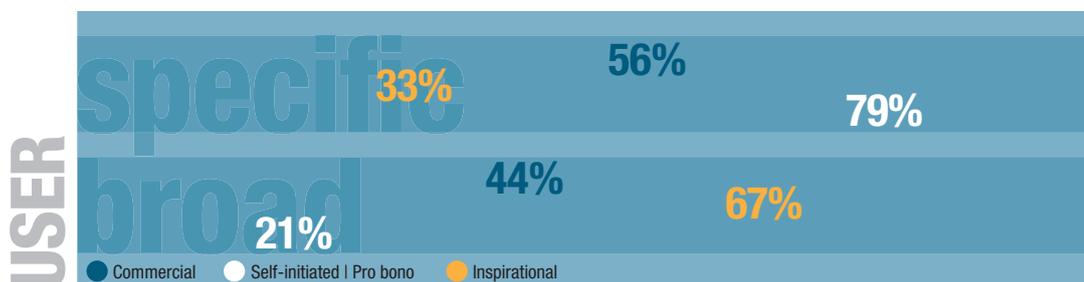
The targeting of a specific group of users by a website could be identified through an analysis of language, tone, aesthetic and functionality. For example, the designer of a creative art and design hub was undoubtedly targeting young Australasian creative people. The identifying characteristics of this website were established through the use of vernacular language and aesthetic. The quirky characteristics, applied throughout the website’s structure, were reflected in its functionality, behaviour and visual language. The targeted users were referred to as ‘galahs’ and the ‘two bob mob’.

Identifying whether a website targeted a broad user group was equally straightforward, as the language, tone, aesthetic and functionality were typically designed more in line with a universal system that was uncomplicated and simple to use. One website, for example, was designed to promote a new car model. With no transaction facilities available, the website’s objectives were clearly focussed on communicating the value of small cars as well as subtly communicating positive brand attributes of the specific car model. As such the language, tone, aesthetic and functionality were designed to reach a wide user group – that is, anybody interested in small cars.

It was interesting to note that self-initiated and pro bono websites contained more identifiable clues as to the intended user, while the commercial websites sought to attract the widest user group. Significantly, whenever a specific primary user group could be identified in the commercial websites, a secondary user group could also be recognised. It appeared that by targeting a very specific group, the graphic voice and function of the website became attractive to a wider user group, giving the website broader appeal.

Comparison between websites the designers designed and those they found inspirational showed the latter to be markedly different from the former. Overall, the inspirational websites were more experimental and did not appear to target a specific user, instead deploying interactivity in a way that would be intriguing and compelling for any user. As such, they had a universal approach to design and engaged the user with playful functionality and an aesthetic that was both fun and an appropriate expression of the website objectives. Figure 7.15 shows the comparison between the three types of websites studied.

Figure 7.15: Factors constituting the theme of the user



The main pattern to emerge in Figure 7.15 was the different ways that the user was targeted. In commercial, self-initiated and pro bono websites, the user was identified more easily, demonstrating that commercial web design required designers to understand and target a specific user group, as opposed to experimental sites. For instance, six of the inspirational websites were evaluated as immersive and exploratory. Their primary objectives were to engage the user in a playful encounter that had no distinct communication imperatives. This contrasted with the majority of the commercial websites that the designers developed. Even though 87% of the inspirational websites were evaluated as informational, the users in 61% of these sites were identified as broad, suggesting that the communicated content had universal appeal. Notably, this suggests that the preferred websites employed interactivity in ways that made the experience more exploratory, as opposed to working within commercial parameters.

A review of the sample websites revealed specific details about the users of specific websites. In Chapters Five and Six the data suggested that the user was stereotypical. However the findings from the protocol tools showed that the designers had a clear understanding of the primary and secondary audiences, and that they used this knowledge to establish clear objectives and project parameters. Moreover, the websites that targeted a non-specific user group did so based on the objectives of the website. Considering whether the website was

targeting an audience that was narrow and homogenous in its demographic and psychographic makeup, or broad and conglomerate, on the basis of an analysis of the visual language used revealed that the designers constructed a sense of the user throughout the design process. By the time the website was live, they appeared to have formed a detailed persona of the user group(s). What was perceived as stereotypical knowledge in the interviews and diagrams seemed to evolve iteratively through the design process. As I was not privy to the designers' process of user profiling, it could be argued the designers formed a sense of the user based on a set of assumptions. That said, based on my interpretation of the websites, the aesthetics, language, type of information, motion and tone suggested that the sample websites were being designed with a particular user group or groups in mind.

## 7.4 | Does the purpose of a website affect its design?

In the interviews designers claimed the main purpose of web design was to create unique experiences that empowered the user. When viewing the websites, the particular ways they might achieve this outcome became clearer. As was seen in Figure 7.8, there was a range of factors that related to the overall experience of a website. These factors collectively allowed exploration of the extent to which interactivity is embedded in the purpose and experience of using the website. This section further examines the findings in which the purpose determines the concept and direction of the designed experience. Additionally, it compares different types of experiences within the three categories: commercial, self-initiated or pro bono, and inspirational.

In Figure 7.8 the experiences were graphed in the same order as they appeared in the protocol tool. Figure 7.16 presents the data differently in order to look at the predominant intentions of the websites developed by the designers as well as those they considered inspirational. What is interesting in Figure 7.16 is that the main intentions underpinning all the websites can be organised into four categories: transaction, information, promotion and experiential. In this context other factors within the theme of experience become characteristics that contribute to the main intention.

Interestingly, the main difference between the commercial, self-initiated and pro bono websites is that there are more transactional websites in the self-initiated and pro bono category. What becomes apparent in Figure 7.16 is that the factors grouped into the theme of experience are interrelated and require further examination as to how they contribute to a website whose purpose is transactional, informational,

Figure 7.16: Website intention



promotional or experiential. What emerges in Figure 7.17 is that no one factor of experience operates in isolation. Within each sample website there were a number of factors that were deployed to achieve its purpose. For instance, factors such as information, brand and user-centric were present in the majority of the websites. This was not to say that the purpose of all sites was informational – some used information for promotion or transaction purposes. Similarly, factors such as playful, emotion and persuasion were evident in the commercial websites and appeared to be closely aligned with experiential, informational and promotional websites. While Figure 7.16 highlights the intentions of the designers' sample websites, it does not account for the attributes that achieve the purpose. To this end, Figure 7.17 is significant because it shows the elements working as a cohesive whole.

Notably, Figure 7.17 highlights how a website's purpose affects its design. The majority of the inspirational sites were perceived as informational and promotional. Nevertheless, they were less commercially oriented and did not appear to have to conform to commercial parameters. While the brand factor maintained a strong presence, the difference between the designers' own websites and those they thought inspirational was the employment of interactivity in the inspirational websites to achieve what could be considered an immersive experience. Within the inspirational category, 47% of the websites were evaluated as immersive, compared to 5% of the commercial websites and 21% of the self-initiated and pro bono websites. The factor of immersion was aligned with the factors playful and exploratory, suggesting that, in the inspirational websites, information and promotions were delivered via playful features. Interestingly, the use of emotion or persuasive factors was low in the inspirational sites, suggesting that designers perceived that the deployment of interactive behaviours could be compelling enough to motivate a deep level of user engagement in the act of communication.

Figure 7.17: Relationships between the factors of experience

**WEBSITE EXPERIENCE RELATIONSHIPS**

websites examined	brand	transactional	informational	promotional	immersive	exploratory	playful	community	user-centric	emotive	persuasive	WEBSITE TYPE
01	●			●		●	●	●	●	●	●	<b>COMMERCIAL</b>
02	●		●	●		●	●	●	●	●	●	
03	●	●	●	●					●	●	●	
04	●		●	●					●		●	
05	●		●	●		●	●	●	●	●	●	
06	●	●	●	●				●	●	●	●	
07	●		●	●		●	●	●	●	●	●	
08			●	●				●				
09	●		●	●		●	●		●		●	
10	●		●	●		●	●	●	●	●		
11	●	●	●	●					●	●		
12	●			●		●	●	●	●	●		
13	●		●	●				●	●			
14	●		●	●				●	●			
15	●		●	●		●	●		●	●	●	
16	●		●	●		●	●		●	●	●	
17	●		●	●					●		●	
18	●			●		●	●	●	●	●		
19			●	●		●	●		●			
20	●		●	●		●	●		●			
21			●	●		●	●		●			
22	●	●	●	●				●	●	●	●	
23	●		●	●					●			
24	●		●	●					●			
25	●	●	●	●	●	●			●	●	●	
26				●		●	●		●	●	●	
27				●	●	●	●		●	●	●	
28	●	●	●	●					●	●	●	
29	●		●	●					●			
30	●	●	●	●			●		●			
31		●	●	●		●		●	●	●		
32	●	●	●	●					●	●	●	
33					●	●	●	●	●			
34			●		●	●	●	●	●			
35	●		●			●		●	●			
36	●		●					●	●			
37	●		●	●			●		●			
38	●		●	●	●	●	●	●	●			
39	●		●	●	●	●	●	●	●			
40	●		●	●	●	●	●	●	●			
41	●		●	●	●	●	●	●	●			
42	●		●	●	●	●	●	●	●			
43	●		●	●	●	●	●	●	●			
44	●	●	●	●		●	●		●	●		
45	●	●	●	●					●	●	●	
46	●	●	●	●					●	●	●	
47	●	●	●	●		●			●	●	●	
												<b>INSPIRATIONAL</b>

The evidence presented in Figure 7.17 substantiates earlier comments that the collective objective of the websites was primarily for information and promotion purposes. Of all 47 websites, 27% had features that enabled sales transactions, 87% were information-rich and a further 87% were promotional. Significantly, the sample websites demonstrated playful (57%) and exploratory (48%) characteristics as a primary method of delivering information, compared to emotional (40%) or persuasive (36%) techniques. Overall, 42% were evaluated as encouraging a community of like-minded users, and of this percentage, 60% of websites did so through immersive, exploratory and playful factors. Brand awareness and recognition cannot be overlooked in the purpose of the websites. Across all categories some aspect of brand recognition was present in 85% of the websites, consistent with the underlying objectives of transactional, informational and promotional websites.

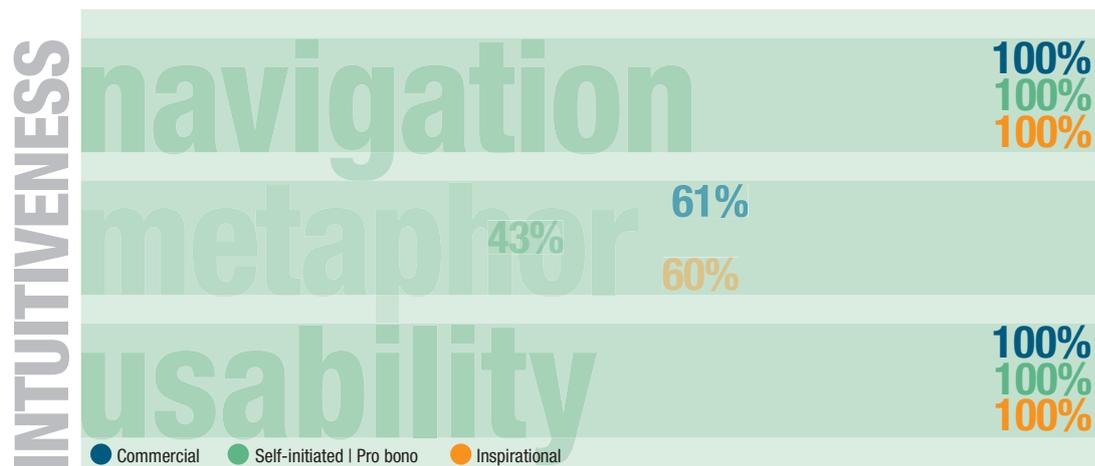
Examining the websites has highlighted some important findings in relation to experience. Of the eleven factors, four of them could be categorised as the catalyst that determined the website objectives – exploratory, transaction, informational and promotional – with the remaining seven factors referring to characteristics or behaviours that enhanced the experience. What is obvious in Figure 7.17 is that no single factor operates in isolation. Rather, they act in combination with other experience factors as well the other themes. Based on conversations, it was surprising that the designers' websites did not overtly use emotive or persuasive language, or imagery. The findings suggest that an emotional connection was forged based on a combination of the characteristics, behaviours and usability of the site, in addition to the content.

## 7.5 | Is interactive functionality evident in web design?

Throughout the sample websites, there was ample evidence of interactive functionality that played out through each of the themes, regardless of whether its presence was visible or invisible. Indeed, some of the themes were comprised of factors that were considered by the designers to be interactive functionality. An example are the factors in the theme of responsiveness: action/reaction, immediacy and functionality. This section re-presents the findings discussed in section 7.2 with the additional data from the inspirational websites in order to compare the designers' employment of interactive functionality in commercial web design with those websites whose interactive functionality was identified as inspirational by the designers. In Figures 7.18–7.23 I have introduced a hierarchy of interactive functionality using a transparency filter to differentiate between factors directly related to the interactive functionality underpinning a website and those

factors that are perceived as part of the content. The factors not directly related to interactive functionality are reduced in colour to create a two-level hierarchy. The purpose of this section is to examine the factors that are perceived as interactive functionality and which are likely to be developed by coders or programmers. To begin, Figure 7.18 examines the factors in the theme of intuitiveness.

Figure 7.18: Interactive functionality within intuitiveness

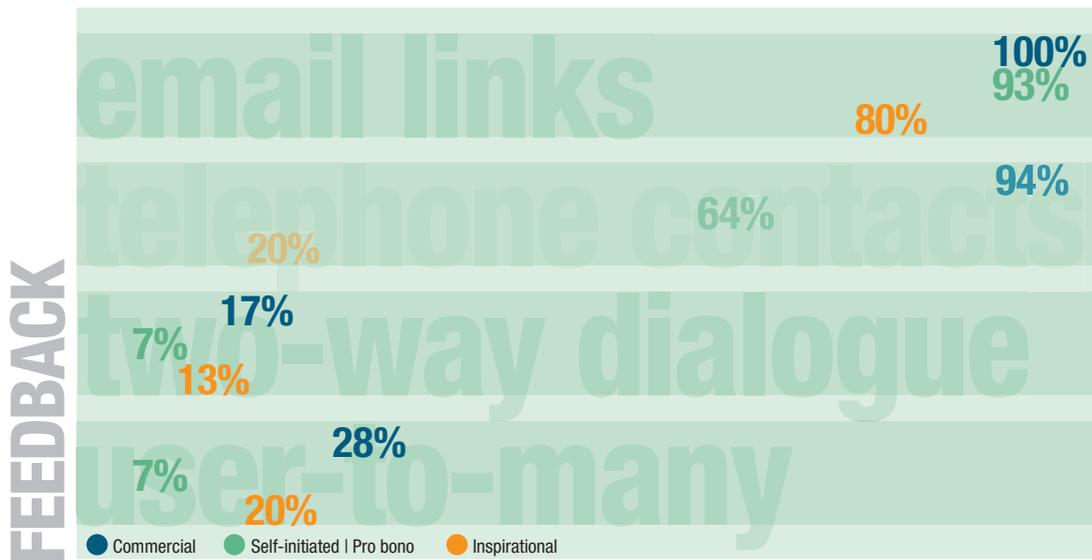


In Figure 7.18 it is apparent that interactive functionality was employed across the sample websites to provide users with a navigation system that guided them and enabled them to access content easily within the website. Questioning whether the websites were easy to use addressed the speed with which the structure was understood. Both the navigation and usability factors relate to the infrastructure of websites, for which interactive functionality, although invisible, was a necessary component that made the site function.

Within the websites, the use of metaphors was diverse. In some websites metaphors were integral to the narrative, but did not display any interactive behaviour, while in other websites the use of metaphor was linked with the navigation, orientating the user through familiar behaviours such as book or shopping metaphors. Due to the diverse ways in which metaphors were used, this factor had a transparency filter applied to it. Interestingly, metaphors were the variable factor in Figure 7.18 which showed that commercial and inspirational websites displayed a similar deployment of metaphors.

Figure 7.19 investigates the measure of interactive functionality within the theme of feedback. Within this theme, I examined the channels through which the user could obtain feedback or engage in a two-way dialogue.

Figure 7.19: Interactive functionality within feedback



Similar to Figure 7.18, the factor not strictly relating to interactive functionality, telephone contacts, has been made transparent in order to focus on the factors that display interactive behaviours. Notably, the data showed that hyperlinks to designated emails was the most frequent form of obtaining feedback. Within this factor there was variation between the three categories of website, with the inspirational websites rating 80%; commercial rating 100%; and the self-initiated and pro bono websites rating 93%.

Figure 7.19 shows a significant drop in the use of interactive functionality to facilitate two-way dialogue or redistribute communications. With regard to these two factors, it was interesting that the capacity for feedback was identified with more frequency in the commercial websites. However, while the literature suggested that the facilities for two-way dialogue, two-way discussion or face-to-face exchange were a critical characteristic of interactivity, the data showed that the designers made little use of these features in commercial web design when compared with other interactive functions. As such, the presence of functionality that enabled face-to-face exchange was rare in the websites. In instances where two-way dialogue and user-to-many functions were present, they were in situations for which they were integral to the site's objectives. Thus, they occurred more frequently in social awareness websites where the purpose was a call to action or to spread the word about a social issue.

Figure 7.20 examines interactive functionality in the theme of responsiveness. All of the factors within this theme directly related to the behaviour of the websites and how they responded to the user's input. Similar to Figure 7.18, factors that were

perceived to underpin site structure rated highly in the protocol tool, suggesting that for a website to be live on the web, its functionality had to be fully resolved.

Figure 7.20: Interactive functionality within responsiveness

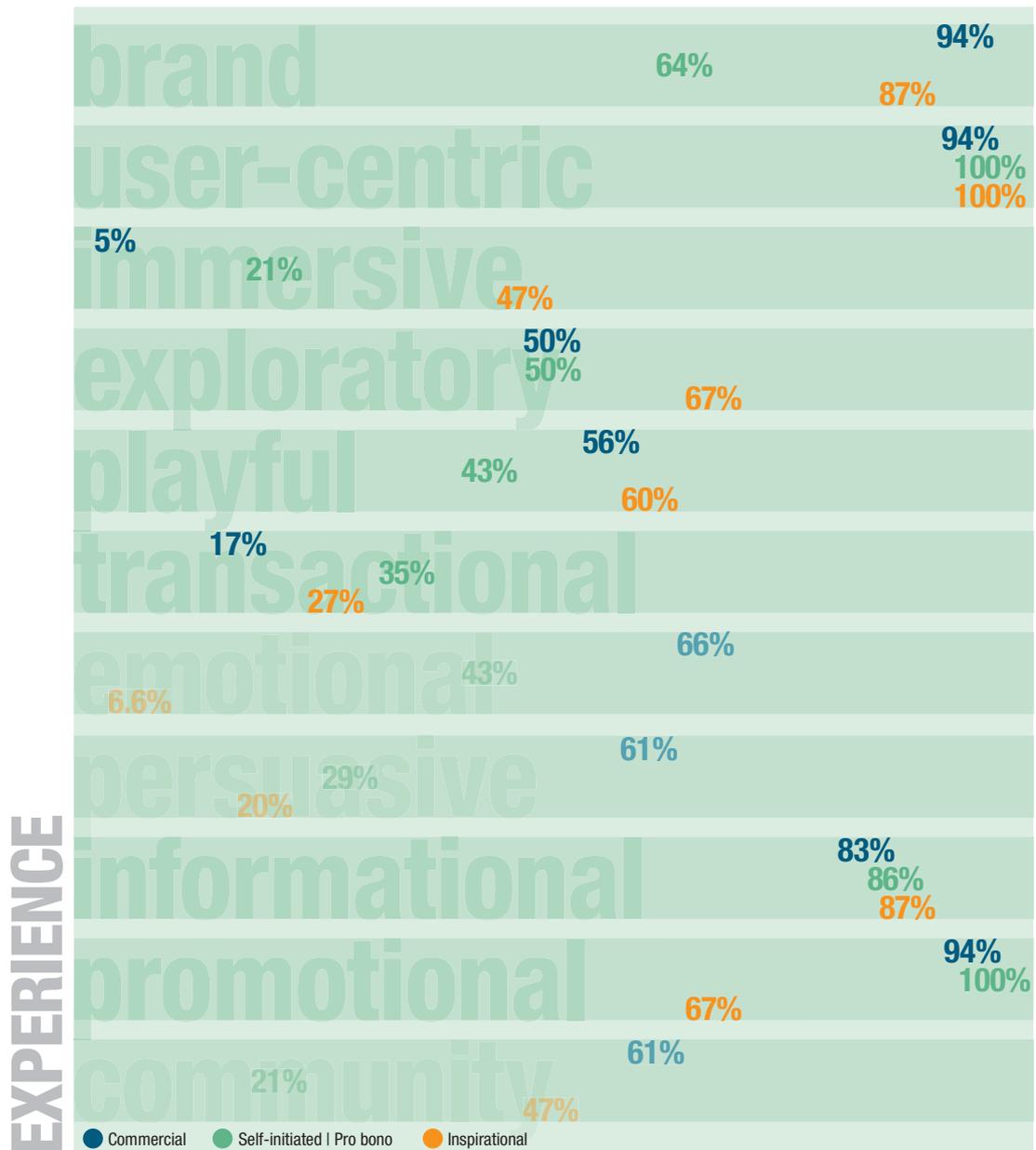


The factors within responsiveness were interrelated and could not be viewed as separate entities. For instance, action/reaction was linked with immediacy and functionality. In looking at Figure 7.20, it is evident that the employment of interactive functionality is critical to the responsiveness and overall success of a website.

While the theme of experience was examined in detail in the previous section, Figure 7.21 extrapolates on the factors which displayed interactive behaviours that contributed to the overall experience. These were the factors immersive, exploratory, informational, promotional and transactional. While the other factors displayed interactive characteristics, playful or persuasion were not interactive as such, but rather a characteristic of a site that produced a sense of play or persuasion. Similarly, it can be argued that interactive functionality was necessary to enable an online community. However, since the initial question regarding community did not specify whether it was online, transparency was applied to this factor.

From Figure 7.21 it is worth noting that the inspirational websites displayed a higher percentage of interactive functionality, as measured by the immersive and exploratory factors. It could be assumed from the data that the websites in this category were more experiential and contained less commercial constraints, despite the high percentages of questions answered positively regarding the brand factor. Although the inspirational sites were less concerned with brand (87%) than the commercial websites (94%), the data shows that the effective employment of interactive functionality was considered as a positive brand attribute that affected the experience. Despite the strong brand

Figure 7.21: Interactive functionality within experience

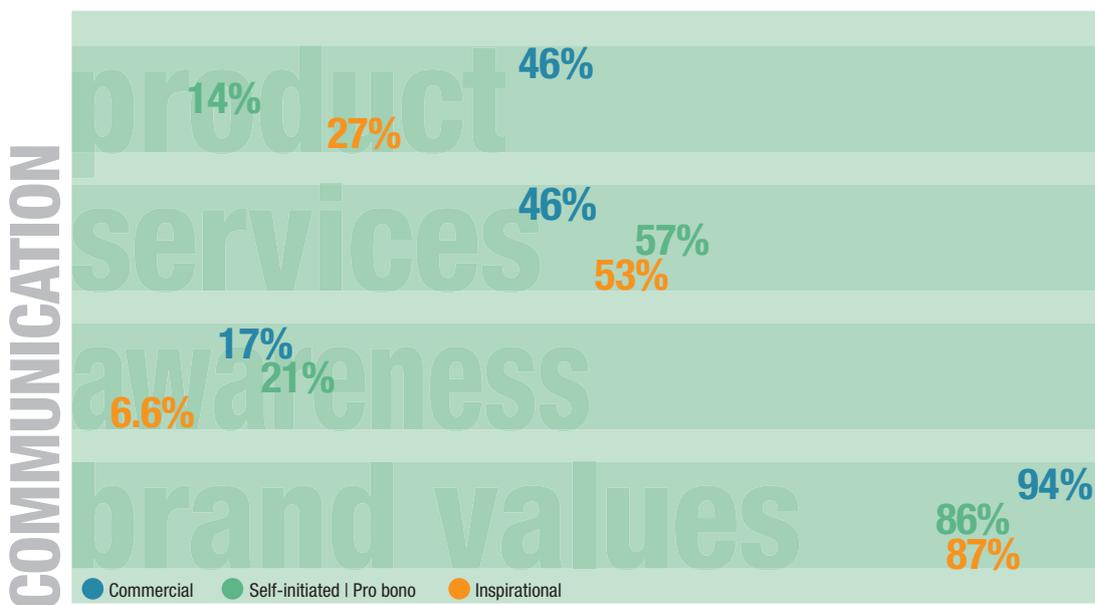


presence in the inspirational websites, it is interesting that they were evaluated as being less promotional (67%), but containing more transaction functionality (27%) than the commercial websites (17%). Additionally, the inspirational sites were evaluated as being more informational than the commercial, self-initiated or pro bono websites, suggesting that the websites the designers were inspired by had less commercial constraints influencing their design direction. As such, content was explored and delivered in ways that were not bound by commercial convention.

It was surprising that the inspirational websites were found to measure highly on the brand and brand-value factors. Based on the findings from the

interviews and the diagrams, it was assumed the inspirational websites would be less concerned with a branded experience. However, the findings in Figures 7.21 and 7.22 revealed that interactive functionality reflected on the brand even when the objective was exploratory. Figure 7.22 compares the three categories in terms of communication, and it can be seen that the communication of brand values was a high priority in each category.

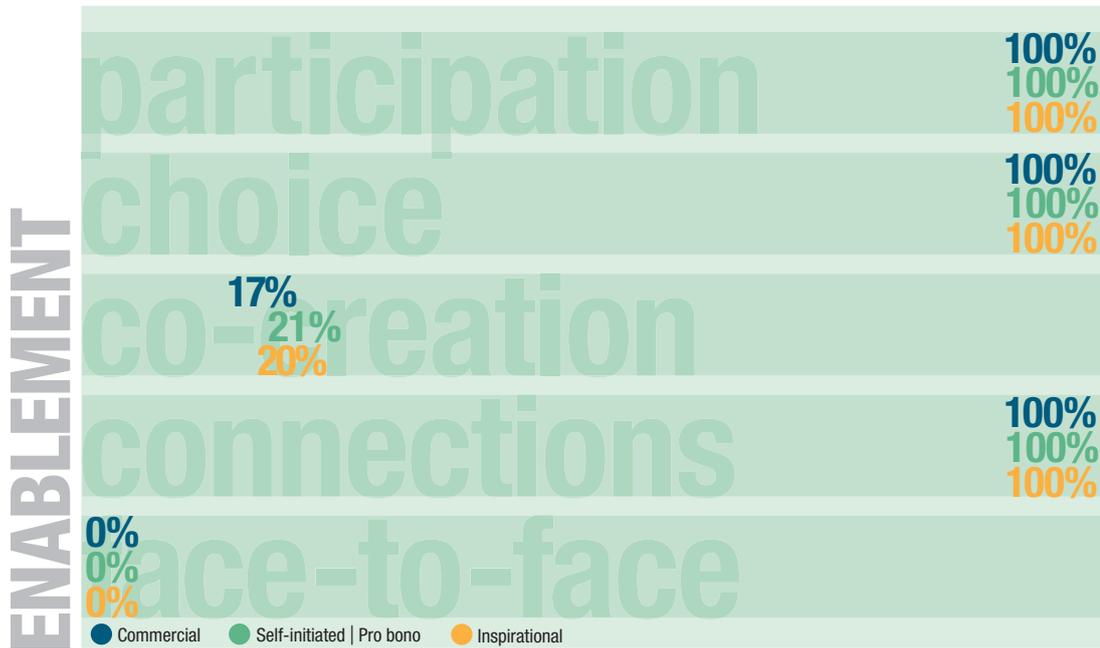
Figure 7.22: Interactive functionality within communication



These findings indicate that interactive functionality underpins the sample websites and facilitates the majority of factors to varying degrees. Similar to the self-initiated and pro bono websites, the inspirational sites measured highly in both the service and brand value factors. Half of the self-initiated and pro bono websites were analysed as communicating a service that was embedded within the websites, such as a content management systems (CMS), rather than an external service. The inspirational websites also contained services and, based on Figure 7.21, these services centred on mechanisms that empowered information collection or systems that enabled the exploration of aggregated data. As such, the inspirational websites contained complex interactive functionality that combined real-time data gathering, video streaming and global positioning systems (GPS) along with data visualisation that functioned responsively in real time.

Figure 7.23 is the final diagram in this section, comparing the factors in the theme of enablement. There was very little variation in the data in Figure 7.23 except for the factor co-creation, for which the difference between the categories is slight.

Figure 7.23: Interactive functionality within enablement



Interactive functionality is a critical factor underpinning user motivation. All of the sample websites displayed functionality that was engaging, enabled choice and facilitated easy access, so that the user could participate in the website. The data also rates highly in facilitating choice and affording connections for users. The factors in enablement – participation, choice and connections – are consistent with the findings for the themes of intuitiveness and responsiveness, and can be perceived as an expectation of interactive web design. As can be seen in Figure 7.23, the designers employ interactive functionality to enable and encourage the user to engage and use the website for its intended purpose. While the idea of co-creation and face-to-face exchange typified some of the activities that interactive functionality was said to facilitate, both of these factors rated poorly in commercial web design, as did the inspirational sites.

A key point that emerged was that all the designers supplied a variety of websites that employed interactive functionality in diverse ways, ranging from very simple – a five-page website with hyperlinks – to more complex interactive functionality that visualised aggregated live data, or contained GPS information. Notably, the websites containing higher levels of experimental functionality were more likely to be located within the inspirational category. The main variations in interactive functionality within commercial web design occurred in its visual representation – that is, feedback links, designed experience and visual communication. The employment of interactive functionality – coding and programming – was critical for all the websites,

evidenced in the themes intuitiveness, responsiveness and enablement. The visual manifestation of interactivity in designed experiences was equally important, but difficult to quantify because of the diversity with which the designers employed it in web design.

We can conclude from these findings that the designers employed interactive functionality in commercial, self-initiated and pro bono websites in two ways: 1) as the underlying infrastructure that ensured that the website functioned and that content was accessible within the site structure; and 2) to inject visual objects exhibiting responsive interactive behaviours into the website. Designers implemented interactive functionality in a way that was in keeping with the overall concept and design direction of the website, so that all the elements communicated in the same voice as one unique experience. The interplay between interactive functionality and the visual design of a site is complex. Both areas inform and influence each other. It was interesting to note that the websites the designers were inspired by displayed similar characteristics to those they designed, with the main difference being the commercial objectives. The inspirational websites appeared unconstrained by commercial conventions even though they had a strong brand presence, which indicated that the designers in this study sought inspiration from design-related websites.

## 7.6 | Are perceived constraints identifiable in the sample websites?

The majority of the websites that the designers cited were fully functional and could be said to have overcome any constraints present within the design process. As discussed in Chapters Five and Six, the main constraints spoken of, or visualised outside of the usual design considerations, were the clients, the screen format and a sense of presence. From a functional perspective there were no identifiable constraints in the websites cited by the designers. From another perspective, however, constraints were identified by a lack of clarity (tone of communication, aesthetic and graphic voice) and a website's capacity to create a sense of presence using its immersive qualities.

While the protocol tool was used to identify the presence of factors in the websites, identifying some constraints, such as client impact on the design process, required a greater emphasis on the visual analysis of website content. The best way to demonstrate the resolution of a communication problem in web design is by comparing two websites in order to highlight the differences in the way their purpose is achieved and communicated coherently. Within the 32 commercial,

self-initiated and pro bono websites studied, one social awareness website demonstrated conflicting approaches to the aesthetic, tone and text. The objective of the website was to communicate a humanitarian issue, garner support and build community in order to curb social injustice. However, the visual approach for this confronting issue was sentimental in its use of softly focussed images. The use of a letter, written as a metaphor for happier times, was nostalgic and unconnected to the tone and language throughout the website. For example, an error page displayed the comment, 'Easy tiger. This is a 404 page'. Although friendly and informal, this language was in stark contrast to the website's imagery and indicated a dislocation between all components of the website. Furthermore, a comment such as this carried an assumption that the user had previous knowledge of 404 errors. The absence of unified elements resulted in a diluted message that lacked clarity and would possibly fail to meet its objectives of building community and support.

Another website with similar intentions encouraged users to speak out and take action against climate change through a set of metaphoric postcards of iconic Australian landscapes. The site was designed to encourage users to send a message to the Australian government. Unlike the website discussed above, this site employed emotional language and imagery coupled with interactive functionality in a cohesive way, which encouraged and equipped users with the tools they needed to respond immediately to the call to arms. The message and desired action was communicated in a clear, unambiguous voice that worked across the design, visual language and interactive functionality. This website demonstrated the powerful effect of clear objectives compared with the earlier website, where communication was compromised due to the lack of a cohesive approach.

The answer to the question of whether the websites overcame the constraints of the screen format to create a sense of presence lies in the immersive experience of the websites. I approached this question simply by comparing the use of metaphors in the websites. According to the findings, 23% of all the websites used devices that created a sense of presence that could be perceived as immersive. Of that 23% of these websites, 90% displayed a strong use of metaphors that simulated real world activities. They used elements from the physical world in a digital realm, such as digital pop-up books; GPSes, visualisations of aggregated data in ways similar to mind mapping that displayed threads and connections between topics and metaphorical art galleries or bookshops. The majority of the sample websites highlighted that the commercial websites were not considered immersive experiences.

Based on the percentage of 23%, it could be argued that the constraints of the screen format on a sense of presence are not always overcome. The question that emerges from this finding is whether an immersive experience is necessary in commercial web design, which is more task-oriented. Within all categories,

almost half of the immersive websites (45%) used game engines, or characteristics associated with online games, to engage and involve the user in the communication.

The client constraints discussed in Chapters Five and Six could only be identified where the communication objective of a site was not designed as a unified voice, and the sum of its parts remained unconnected. While this occurred in a small percentage of the websites, it highlighted the overall strength of most of the sample websites, which communicated as a cohesive entity across all components. As to whether the screen format and sense of presence were perceived as constraining is questionable, and this will be discussed further in Chapter Eight. The majority of websites that the designers developed were not immersive, suggesting that there was little need to create immersive experiences in commercial web design. A sense of presence was more evident in the inspirational websites, which engaged the user in reactive experiences that mimicked real scenarios, such as bouncing pebbles, sculpting clay or mixing sounds to create data loops. Within these sites, boundaries evaporated. The user could engage in familiar physical activities in a digital environment in order to trigger a digital response. Therefore, what may have been perceived as constraining could be reframed to question the appropriateness of specific approaches to commercial web design.

## 7.7 | Can web conventions be identified in the sample websites?

Comparing the themes highlighted a number of web conventions that were operational within websites across all categories. Figures 7.24–7.29 demonstrate how these conventions ensured that users could apply behaviours learnt in other web experiences and how designers were keen to establish a shared set of expectations. To begin, Figure 7.24 shows the comparative data in the theme of intuitiveness. There is little variation in the findings, with both the commercial and the inspirational websites evaluated as being intuitive (87%) and self-initiated or pro bono (81%).

Figure 7.24: Identifying conventions in intuitiveness



Based on these findings it can be surmised that a website is expected to be intuitive and, that, this end, intuitiveness has become regarded as a convention of web design,

particularly within the areas of navigation and usability. The sample websites were designed in such a way that used interactive metaphors to enhance usability. While some websites employed more conventional metaphors, others used metaphors to create an immersive experience.

Figure 7.25 examines the theme of feedback. The findings suggested that feedback was present in all of the websites in varying degrees. Figure 7.19 presented the four factors measured within this theme, and the dramatic variation in the data accounts for the lower values in Figure 7.25 below. Nevertheless, it can be stated that the web is understood as a communication tool and expected to have the capacity for feedback – that is, dialogue and exchange. As such, the inclusion of features that facilitate feedback has become a web convention.

Figure 7.25: Identifying conventions in feedback

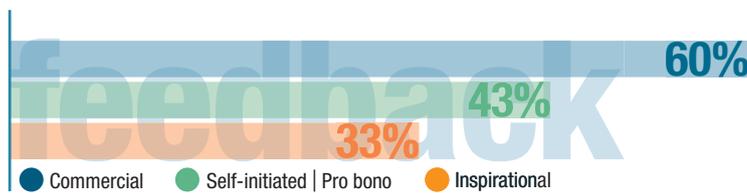


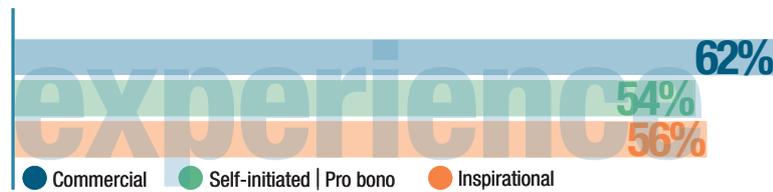
Figure 7.26 shows the functional factors within responsiveness (action/reaction, immediacy and functionality) all evaluated at 100% across the three categories of websites. These findings highlight that responsiveness is an expected outcome of websites and as such has become a convention of web design.

Figure 7.26: Identifying conventions in responsiveness



When looking at Figure 7.27 it could be said that there are less conventions associated with the theme of experience when compared with the theme of intuitiveness or responsiveness. Significant in these findings was the diversity of factors within the theme experience and how these were able to be further categorised into interactive functionality, which is a web convention, and the interactive characteristics and behaviours of visual objects that were unique to each website.

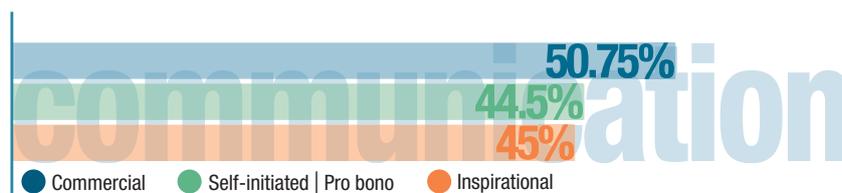
Figure 7.27: Identifying conventions in experience



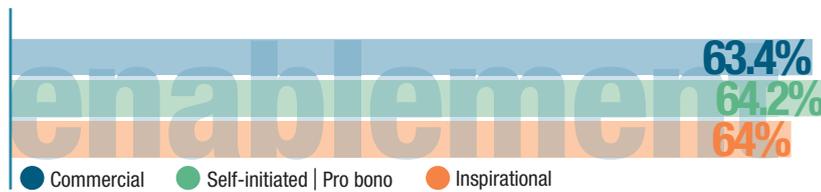
A point to emerge from the website analysis is that creating a web experience has become a convention for web designers, but the type of experience they develop is unconventional, fresh and surprising. Within experience, communication is not restricted to reading, but occurs across many levels of the experience: interactive functionality, design, aesthetic and responsiveness. It is interesting, therefore, to examine Figure 7.26 in conjunction with Figures 7.24 and 7.29, because many of the factors in the theme of experience are designed in conjunction with the themes of responsiveness, intuitiveness and enablement.

Figure 7.28 showed that the factors in the theme of communication reflected the type of communication in the websites – that is, whether it related to a product, service, social awareness or brand recognition. These factors overlapped with those from experience – the characteristics from experience contributed the tone of the communication. These findings indicate that communication is central to web design, with some the variation in the type of communication used.

Figure 7.28: Identifying conventions in communication



Similar to Figures 7.24 and 7.26, there was an expectation that websites would enable the user to interact with the content and accomplish tasks, whether it was playing games, completing a transaction or gathering information. Figure 7.29 shows that there are conventions surrounding the expectation that interactivity in web design is implemented as a tool that enables the user to respond. In saying this, there was a natural affinity between the themes of intuitiveness, responsiveness and enablement, for which the interactive functionality factors overlapped and supported each area.

*Figure 7.29: Identifying conventions in enablement*

To conclude, a number of web conventions could be identified within the websites. They ranged from visual to behavioural in nature and affected how the functional features of a website looked and behaved. Evidence from the protocol tool also indicated that a set of expectations were in place regarding the functionality and usability of commercial web design. Despite the presence of conventions, it is important to note that many visual elements in individual websites were unique, suggesting that the use of conventions is not applicable to aesthetics.

## 7.8 | Examining how concepts are realised in web design

Visual analysis of the websites showed that concepts are realised in web design from two perspectives: as a functional system that underpins and supports content delivery, and in a visual form that communicates and engages the user in the overall idea. While a concept should encompass both areas of development, these areas have different functions within web design and therefore require careful consideration and integration. In this section I will reconfigure the factors in each of the themes to visualise how the designers actualised concepts, both aesthetically and functionally, over multiple layers of web design.

In Figure 7.30 I have regrouped the data from the different websites into two levels in order to examine the layers that work in conjunction with each other. Functionality and behaviours form the first level (the blue background layer) and interactive objects, purpose and visual design form the second (the white percentages). By reconstructing the data differently I was able to represent the invisible elements that the designers discussed as underpinning the factors of experience. In the blue background, the words navigation, usability, choice, immediacy, action/reaction, functionality, participation, and connection refer to factors highlighted as interactive functionality, while the top layer demonstrates the types of websites and their characteristics. For example, 97% of the websites designed by the designers are promotional, and of this figure, 52% are service related, 30% promote products and 19% promote a social awareness issue. In terms of characteristics that are used to achieve these objectives, 55% have emotional overtones and 50% use playful or exploratory attributes to engage the user in the communication.

Figure 7.30: Design considerations in concept development



Significantly, Figure 7.30 highlights that brand and brand values are evident throughout the visual and functional approach of commercial web design. The designers in this study designed branded experiences that were informative and equipped the user with the tools required to operate the site. In the blue layer, there is a substantial gap between the upper percentages – email links, user centric, promotion, brand values, information, brand, telephone links – and the next level: – emotion, metaphor, service, exploratory, playful, persuasive and community. Based on the findings throughout this chapter, the upper percentages could be described as the purpose, with the lower percentages referring to the characteristics that the designers develop to support the purpose. In all of the sample websites these elements are integrated, because factors overlap and contribute to the whole. Behind a website’s objectives is its interactive functionality, substantiating data from the interviews that showed web design to have multiple dimensions, making it therefore a more complex proposition when compared with design for print.

The websites that were studied demonstrated the growing complexity of concept development for web design. The designers had to consider interactive functionality, behaviours, aesthetics, design and the user in their design. The successful integration

of function, information, design and user behaviour resulted in concepts that communicated in one voice across multiple dimensions. Therefore, based on the evidence, web design brings into play a new way of thinking about communication within the web, which includes type, image, space, motion, connections, choice, sound, action, reaction, cognition, behaviour, expectations, collaboration, development and production. Central to these elements is interactivity and its capacity to facilitate the convergence of all of these components of web design in ways that are useful and that empower the user.

## 7.9 | Conclusion

Asking how designers deploy interactivity in web design highlighted a gap between their perceptions and actions. While Chapters Five and Six revealed a range of perceptions, the sample websites examined how designers implement their perceptions of interactivity within web design. The designers perceived interactivity as a tool that empowered the user, as well as a mechanism through which they could communicate to the user. In conversation the designers articulated an understanding that could be perceived as boundless and lacking clarity, and also sometimes contradictory. By mapping their ideas of interactivity, the designers' perceptions were revealed to be more fixed within the specific context of web design. It was only the website analysis that made apparent the narrow parameters within which the designers work. While the designers had a broadminded approach to web design, the commercial domain has strict communication objectives. This meant that the designers had to work in a way that funnelled from broad concept development to the narrow context of commercial design. The following section summarises the findings from the website analysis, highlighting significant themes for comparison in Chapter Eight. Key points to emerge from this chapter are:

- Interactivity was deployed in web design to activate and empower the user
- Interactivity was invisible
- Interactivity in web design was a multi faceted proposition
- The user was identifiable
- Targeted interactive functionality has broad appeal
- Commercial web design does not operationalise all the theoretical constructs of interactivity
- Designers sought inspiration from similar, but more experiential websites.

The sample websites highlighted that the commercial imperative and other contextual factors can affect the ways that designers employ interactivity. Designers sought to motivate a particular response from the user, developing

concepts that encompassed visual, functional, systematic and behavioural content. In addition, designers had to consider the user and their potential response. In this way the designers implemented interactivity in ways that were directed and purposeful, ensuring clarity of meaning and communication.

Any ambiguity in the conversations originated from comments claiming that interactivity was invisible. This was clarified in Figure 7.30, where the transparent elements were visualised as the infrastructure of a website, designed to bind the content together. The sample websites displayed behavioural conventions in action. They were intuitive, responsive to the user's input, enabled the user, displayed a level of connectivity, and provided avenues for feedback. Significantly, the theme of experience demonstrated that interactivity was indeed applicable to many factors, but it only took a graphic form when designers considered the context of a project and its objectives. To this end, the visual manifestation of interactive functionality evolved as designers combined visual objects with interactive qualities that enabled the user to understand and operate the site.

In commercial web design, interactivity was deployed to facilitate task-oriented activities that were informational, promotional, experiential or transactional. Findings from the protocol tool substantiated comments that interactivity was a multi faceted concept performing multiple roles in web design. In the commercial, self-initiated and pro bono websites, two main levels of interactivity could be identified: interactive functionality that underpinned the site, and interactive behaviours embedded in the content. Both levels contributed to the overall experience of the website, but were only identified in the website analysis. Prior to this stage of the study, the designers discussed the invisible aspect of interactivity without any real clarity, leaving their comments open to interpretation.

Identifying the user of the websites was a straightforward task using the protocol tool. This could seem to contradict previous findings from the interviews and diagrams, in which the user was perceived as generic. However, a question also emerges as to the effect that the designer's sense of the user has on the design process. Considering the tone, language, content design, imagery, text, behaviours and functionality of a website suggests that designers engage in active projection of the needs, preferences and abilities of the target audience. The websites found to be the easiest in which to identify the user were those whose elements communicated with one voice. These websites, whether targeting a broad or narrow user group, had clear intentions that assisted in making the website intuitive and responsive. Significantly, the websites that targeted a narrow user group tended to have a broader appeal because of the clarity of their objectives and the approach that the designers used to achieve those objectives. The effect that the user had on the design process and the shape of the final design was evident from the websites themselves.

It was surprising that some of the themes established in the protocol tool – due to their frequent mention in the early conversations – were seldom identified in the websites. Face-to-face exchange and co-creation, while discussed, were not a priority in commercial websites, nor were they identifiable in the inspirational websites, raising questions as to why they were not employed in commercial web design. While the themes showed that feedback was an expectation of a website, the tools employed to facilitate a dialogue or exchange focussed primarily on email links. Telephone listings were also included in the websites, but these were not interactive. The omission of facilities enabling face-to-face exchange raised a query as to whether such features compromised the communication imperative.

Finally, the websites examined in this study highlighted the fact that the communication imperative in web design is a considerably different proposition to that of print design. Communication occurred across multiple layers that involved space, time, behaviours, motion, sound, action, reaction, connections, choice, cognition, expectations, collaboration, interactive functionality and production. Designers encapsulated these elements in their design process to produce websites for which communication was imbued subtly within all components.

As a professional field, it is apparent web design has expanded the scope of communication design, introducing new methods of communicating. Consequently, designers are required to think about their practice in new ways. Therefore, while the designers were unable to articulate a clear concept of interactivity, evidence generated from the protocol tool highlights a sophisticated knowledge of the term in a practical context, which has influenced the way they approach web design practice.

# 8 | Conclusion

## 8.1 Introduction

Designers regularly produce what are clearly interactive websites. Within this activity, designers consider interactivity as a limitless concept, but also as a specific area of knowledge and an associated practical skill serving the practice of web design. The findings concerning the way designers conceive of and implement interactivity demonstrate that designers approach communication design for the web in new and different ways as a consequence of their use of interactivity. It is apparent that web design has shifted ground since the early days of the web. Initial perceptions that web design involved treating the web as an electronic version of print design are no longer accurate. Web design and print design are now very different practices each with a diverse set of design considerations and a distinct way of thinking about how interactivity is used as a communication tool. It is clear from the previous three chapters that although designers are able to articulate numerous and diverse perceptions of interactivity, it is only in their design practice that their understanding of the term has a fixed meaning. While designers have been criticised for not articulating a definitive concept of interactivity, this study shows that they are able to effectively make their perceptions explicit through their work with web design. Furthermore, this practice is influenced on a daily basis by many contextual factors, including, most often, commercial imperatives.

This chapter analyses the specific findings of the previous three chapters at a higher level in order to make sense of the data as it applies to the current state of web design. It weaves together the conversations from the interviews and diagrams alongside the website analysis in order to discuss the designers' concepts of interactivity, examine the relationship between theory and practice, reflect on a growing interactive literacy within design, examine how the practice of communication design has evolved since the emergence of the web, and consider how design principles underpinning communication design have influenced the evolution of the web.

## 8.2 | Designers' concepts of interactivity

In the late 1990s and early 2000s, concepts of interactivity were intertwined with utopian ideals (Julier, 2000), the chaos of convergence (Poynor, 2003), a paperless office, cyberspace novellas and virtual reality. How interactivity was imagined

contrasted with how it manifested on the web. The web's tabular structures, default typographic styles and 16-bit colour palettes restricted designers' ability to create designs that communicated as an integrated whole. While they were aware that the web of the future would become a critical media format in communication strategies, only designers intrigued by interactive space and responsive systems approached design for the web in the 1990s (Julier, 2000; Drucker & McVarish, 2009). Helfand (2001) questioned where the graphic designers were in the new media landscape. Helfand's questions highlight the resistance by some designers to move into the digital space but also her perception that screen-based media required the knowledge and expertise of graphic designers. However, those designers working in the area grappled with additional design considerations and the transferral of specialised print knowledge to a medium that they later realised was different, and that required a significantly different design approach. This thesis demonstrates that, a decade on, the web has evolved into something similar to designers' initial imaginings. Discussing interactivity, the designers interviewed revealed the breadth in which they approach the concept, almost as a utopian ideal. In reality, however, their practice demonstrated a systematic and practical approach to web design. This section examines the designers' concepts of interactivity, comparing their unbridled ideas with their everyday practice of web design.

In general conversation, designers seek to translate their perceptions into concepts that evoke a particular response, whether it is humourous, serious, systematic, chaotic or matter-of-fact. In an attempt to clearly articulate their concepts of interactivity, the designers in this study punctuated their answers with narratives, anecdotes and design scenarios, which, although fascinating, did little to clarify their perceptions, instead painting a more diverse and complex picture of interactivity. In contrast, the designers visualised their perceptions of interactivity quickly. While there was a sense of storytelling in the diagrams, the narratives were not as dense as in the interviews. The diagrams therefore enabled access to thoughts that, in the interviews, were often hidden beneath the stories the designers constructed. What became apparent throughout this study was that the designers' concept of interactivity did not always match the commercial imperatives within which they worked. This meant that their concepts of interactivity were, at times, at odds with the conventions of commercial web design. As a consequence, some of their perceptions were seldom realised in their practice.

Clearly designers' ideas are bound up in their practice of creating unique, distinctive and memorable concepts for clients. The design process in which a concept emerges is an iterative process of thinking and sketching (Forlizzi *et al.*, 2008; Cross, 2006; Lawson, 2006). It is in this space that designers think aloud on

paper. In this study, designers approached the concept of interactivity in a similar way to their practice of solving design problems, seeking to simultaneously identify and resolve the problem of communicating interactivity. As a concept, designers perceived interactivity in the following ways:

- A process that enables connections between designers and user
  - that makes designers more answerable to the user
  - that allows designers to think about the user in new ways
- A type of thinking that could be applied to all aspects of design
- A practice that has changed designers' thinking and approach to the practice of web design.

While some of these concepts were evident in the websites they designed, others appeared beyond the parameters of commercial design practice. An example is designers speaking of being more connected to their user in and through web design, but in reality the connections spoken of were symbolic – very few of the commercial websites contained the interactive functionality that enabled this bespoke connection.

Similarly, the designers' perception of interactivity as a tool that enabled them to know the user suggested that they were more mindful of the user's needs, and as such, were more answerable to the user in their design. However, the findings of this study indicated that web designers still appeared to rely on creative instinct and intuition in determining how a user might interact with the websites they design, as well as what they might interact with. This finding is in line with Forlizzi *et al.* (2008) and Gothelf (2011), who suggest that designers' faith in their own experience as users and creative thinkers largely informs their work. When designers do incorporate research and data collecting methods into their design practice, it appears that these processes are used to develop their intuitive and empathetic approach (Forlizzi *et al.*, 2008).

It is highly significant that, while web design and web use provide the opportunity to collect rich data through analytics that measured user behaviour, the use of such data did not feature prominently in the way web designers conceived and developed their work. This marks a substantial difference between the field of HCI and design. HCI has extensive research traditions that inform practice. Interestingly, while intuition played a role in the initial stages of the design process, it was clear that web designers continuously refined their knowledge of the user in a cyclical process, as they discussed honing the language of a website or adjusting the functionality of a live website. Whether the user was initially imagined or real, designers tracked the movement of real users once the websites were live, resulting in ongoing updates to the websites based on an increased knowledge of

the user's actions over time. This study therefore demonstrates that while design empathy still plays a role in web design, there are other interactive methods at play that designers use to develop their knowledge of users' behaviour, preference and expectations. It was the capacity for ongoing refinement and improvement of a website that designers believed made them more connected and answerable to the user. They believed that this connection between designer and client had forged a greater understanding and empathy for the user. While this concept of interactivity is not interactive per se, it is one of the consequences of interactivity, leading to the need for design to be more mindful and answerable to the user.

Another implication of this new accountability is that web designers perceive that the connective qualities of interactivity have given them the latitude to think about the user in new and different ways, the results of which can be measured and used to adjust design solutions. Designers in this study spoke of forging an emotional connection with the user through the use of communications that considered the user's location and activity, and the context in which they engaged with the communication. The diagrams reflected a similar theme, indicating that designers could think about the user as if they had physical contact with them, highlighting the way that they considered the user as actively engaged in communication. The designers in this study implied they were able to develop ongoing relationships with users through this connection.

The idea that interactivity has changed designers' thinking and approach to design was evidenced in websites that were fully functional and technically resolved, demonstrating that web designers considered the technical and aesthetic elements of a website in conjunction with user behaviours, cognition and expectations. Web design, as understood through this research, involves significant storytelling input from designers that considers how the narrative will unfold over time and distance. The designers conceptualise their role not just in terms of creative direction of the site design, but as producing innovative narrative experiences through which users can better experience a website, learn from the experience and engage with the communication imperatives which motivate that site. Consequently, current web designers have changed their thinking and practice, shifting the audience from being a reader to that of a user who engages in the act of communication.

Significantly, the designers interviewed in this study conceived interactivity as a type of knowledge that was applicable broadly across their practice: 'it's not just buttons and ways that people get information, it's everything – how I'm interacting with this person [and] how I want to make them feel'. Although interactivity was the focus of this study, and although the designers perceived it as an all-encompassing concept, they commented frequently that it should not be the hero. The designers'

websites demonstrated interactivity employed in multiple ways, but never positioned as the hero of the website. Rather, it was one of many elements that contributed to the whole experience. Notably, this way of speaking about interactivity in isolation from its context is in accordance with Bucy's (2004) criticisms of the theoretical discourse, whereby interactivity was continuously redefined within a narrow frame of reference without a context for operationalisation. Thus, while designers were open to interactivity as a broad concept that could be applied widely, in practice they rarely applied interactive principles outside the web. Therefore, the designers' employment of interactivity was purposeful and their website designs were underpinned by clear objectives that were determined by each project's context. None of the designers' websites were exploratory just for the sake of it; they were user-centric, demonstrating the designers' understanding of the links between design, interactivity and user engagement.

The designers' inability to answer questions in a succinct manner in their interviews starkly contrasted with their visualisations, in which they could swiftly illustrate their concept of interactivity. Further to the findings of Crilly *et al.* (2006), this study demonstrated that designers are more practised in communicating visually than orally. Whether designers are articulate is not the question. However, these findings indicated that using words alone was problematic because designers approached them as they would a concept, switching between multiple points of view in order to imagine all possibilities. While it could be argued that the designers' visualisations were as thin as their words, or that designers seek to remain mysterious, I believe that the interviews and diagrams are an accurate reflection of how designers approach a design concept. Notably, this approach was ingrained as it resulted from designers' everyday design practice. Therefore, based on the findings of this study, it can be surmised that the best way to understand designers is by using methods that enable them to articulate using both words and image. That said, there is a difference between what they say and do. Therefore, to truly understand how designers' thoughts are implemented there is a need to compare their thoughts or concepts with how they are actualised in a commercial project, otherwise the designers' perceptions and concepts remain fluid and move beyond the restraints of commercial parameters.

### 8.3 | Theory and practice

More than a decade ago, Steuer (1992) described interactivity as 'the extent to which users can participate in modifying the form and content of a mediated environment in realtime'. Ha and James (1998) identified five characteristics of interactivity as 'playfulness, choice, connectedness, information collection and reciprocal communication'. Heeter (2000) argued that interactivity was 'an episode

or series of episodes of physical actions and reactions of an embodied human with the world, including the environment and objects and beings in the world'. Within interactive storytelling, Crawford (2005) argued that interactivity was a metaphoric process of 'listening, thinking and speaking'. McMillan and Hwang (2002) developed a typology that categorised definitions of interactivity into those pertaining to process, features and perceptions. Later, McMillan (2006) explored three different models of interactivity: user-to-user, user-to-document and user-to-system. Bucy (2004) claimed that many of the issues surrounding interactivity harked back to its chameleon nature, and rather than reinventing the definition, scholars should focus on the overarching theory of interactivity and its operability within a social context. This section discusses the relationship between what the theorists have said about interactivity, what designers do in practice, and whether the prevalent themes discussed in theory are implemented in commercial web design.

This study showed that contemporary designers think in similar terms to the theorists' definitions of interactivity, but while they operationalise some concepts, there are others that are rarely employed in web design. For example, Steuer (1992) spoke of the modification of the form and content, yet designers seldom create commercial websites where the user can participate in an act of co-creation. While users can alter the window size and contribute comments in forums or blogs, they are rarely given the freedom to modify content if it risks compromising the communication imperative. Similarly, the user-to-user model of interactivity discussed by McMillan (2006) was employed infrequently in commercial web design. Moreover, user-to-designer interaction is a term used by designers when a connection is not a face-to-face exchange, but rather a connection that occurs via the content or the document.

Ha and James (1998) commented that playfulness, choice, connectedness, information collection and reciprocal communication were all characteristics of interactivity. Although playful was a common term used by the designers, not all of the sites they cited were playful. In other words, while interactivity can produce play, playfulness is not always the given outcome of an interactive site. Similarly, characteristics pertaining to immersive experiences were rare, and while interactivity can produce a sense of immersion, it was not common in commercial web design. In addition, these characteristics did not appear in isolation, instead overlapping with other interactive characteristics and visual elements that amplified the playfulness of a site or the immersive experience.

Evident in contemporary web design are the main categories that McMillan and Hwang (2002) proposed in their measures of perceived interactivity in addition to the characteristics of interactivity:

- Interactivity – a process that is evident in websites as an invisible infrastructure that holds the content in place
- Interactivity – a feature that is evident in interactive objects employed to empower the user and communicate
- Perceived interactivity – evident in elements that are displayed more or less interactively
- Characteristics of interactivity – evident in the tone and graphic voice of a website.

For web designers, underpinning any specific features within these four categories is the communication imperative. Designers develop websites that are responsive, intuitive and enabling, with familiar features that make the website behave in expected ways that advance the communication. Significantly, theorists define interactivity as an objective concept that is somehow removed from people, which is core to Bucy's (2004) criticism. In contrast, designers approach interactivity as a communication tool and, as such, they operationalise it in ways that make the experience a more human one: they play with it, work with it, push it, stretch it and dress it up so that users can see it, use it and connect with the technology. With respect to web design and the mobile devices that have developed since web design emerged, interactivity makes sense. It is a tool, a skill, a type of knowledge and a set of functions with its own set of expectations and conventions.

As discussed, Bucy (2004) claimed that the problem of interactivity was that it lacked a social context and an overriding theory operationalised within such a context. As we have seen in the design conversations, interactivity was a vexed issue until it was visualised. When the term was discussed as a conceptual construct, the designers had difficulty in articulating a clear understanding of the term. However, through the inclusion of a visual definition of interactivity in this study, the designers inadvertently addressed Bucy's claim by visualising the term as bringing people together through the screen, through content and through the very process of web design. The success of using a visual approach has highlighted the missing link in previous definitions – visual language that contextualises interactivity in a specific environment. With the inclusion of a visual definition of interactivity, the term becomes more meaningful and understood as a multifaceted proposition.

Within their practice, designers do not perceive interactivity as a hero. While it can be many things, both broad and narrow, it is only in conjunction with other elements that it becomes reified and meaningful. When designing a specific site, designers imbue interactivity with key characteristics deemed appropriate for the purposes of

a specific website. In other words, the interactive features they include in the design are selected on the basis of the overall purpose of the site, not just because they create interactivity. This is significantly different to how interactivity was discussed in the early days of the web, when the concept of interactivity was defined in isolated instances and skewed to suit the authors' intent and context (Heeter, 2000). Using this approach, defining interactivity became a contentious issue as definitions focussed on what it was, rather than its context. In contrast, this study reveals that interactivity means very little without its context. Therefore, based on this study, it could be said that interactivity is not a concept but a practice, whose definition and meaning is located in the thinking and doing. Indeed, interactivity could be seen as anything modelled into a plausible outcome based on context and need, rather than as a fixed thing.

## 8.4 | Interactive literacy

In the initial stages of designing this research project, it appeared possible that a clear consensus might emerge among designers about the meaning of interactivity. Once research commenced, however, it became apparent that the designers did not perceive interactivity as reducible to a single theory, or even an agreed set of terms. Rather, they understood it in ways that were multiple and even conflicting, reflecting the fact that interactivity performs many roles and functions in the design process and the production of websites. Based on the findings of this study, designers can be said to understand interactivity in the following ways:

- Specific knowledge that has empowered them to approach communication design in different ways that engage the user in an act of communication
- A tool that affords designers with new modes of expression and more intimate avenues through which they are able to communicate
- An invisible element that facilitates the design of an experience
- A highly specialised skill that allows programmers to facilitate interactive functionality in order to realise and operationalise a designed website
- Facilitating interactions between the user and the client, or the user and the designer, through the website.

Designers used interactivity throughout the entire design process, in effect developing a specific form of design expertise around the possibilities of interactive technologies. Whether they can express it or not, designers have developed what I would term interactive literacy, which is comprised of the five points above and which has developed through their ongoing practice of web design. This next part of this discussion considers the various aspects of interactive literacy in greater detail, as applied to the design process and the broader design community.

Designers think of interactive literacy as a specific type of knowledge pertinent to the web, encompassing the usual design elements, such as text and image, in addition to functional elements, such as actions, behaviours, responsive systems and usability. Moreover, they believe that this new literacy allows them to think differently about the user. In the past the audience were considered to be readers. Now designers are able to develop concepts that can be communicated through interactive characteristics and behaviours. Simply put, designers are able to use interactive functionality to communicate from a practical and symbolic perspective. Attention to these areas produces websites with good usability, and which communicate positive brand values. In this context, interactive literacy does not refer to the specialist skill of coding or programming. Instead it is regarded as a broad knowledge of interactive environments, associated behaviours and expectations. Through interactive literacy, designers believed they could create new meaning by meshing the conventional with the unconventional and juxtaposing familiar metaphors with new technologies in ways that could be experienced, resonating with the user.

As a specific knowledge, designers believe that interactivity is an essential tool to facilitate the new types of communication made possible by the web. These new types of communication were characterised by their responsiveness and immediacy. Communication occurs through all elements of a website, and the capacity for detailed customisation facilitates a more targeted and direct experience. The ability to customise a website allows designers to create a sense of intimacy between themselves and the user, which is a significantly different proposition to the previous models of communication that still operate in mass media paradigms. While designers develop commercial websites that target either a specific or broad user group, interactive literacy enables them to develop concepts that elicit the desired user response.

Interactivity is now clearly understood by designers as an invisible force that, when paired with a visual manifestation, can be a compelling environment that can be experienced in some way. In this study it was apparent that interactivity in web design was perceived as a major component. It provided the infrastructure for a functional website and embedded objects with responsive qualities. As an invisible element, interactivity can be seen as boundless, and it could be perceived as anything that might be associated with this kind of responsiveness. To overcome this ambiguity, within the context of design for the web, designers have clearly developed a narrative for themselves, in which they visualise interactivity and design experiences, that enact interactivity as a tangible form for users.

Designers have recognised interactive functionality as a critical component of the web, but one that can only be implemented through highly specialised knowledge

of programming and coding. Even though designers may not necessarily have this knowledge, there is a recognition that it is pivotal in web design. This suggests that designers have become deeply conscious of the fact that web design must now proceed through partnerships between designers and programmers. In a sense, while designers believe they understand and control interactivity as an experience or design outcome, they also recognise that the specifically created elements needed for that outcome are not necessarily theirs to make. Whether they can write code or program is not of consequence, because designers have an interactive literacy that enables them to think, develop concepts and solutions beyond the technological constraints.

Within web design, interactivity is perceived as the glue that holds together a collection of diverse elements and enables them to be used. Interactivity facilitates interaction between the user and the product, the user and the client/company, and indeed, the user and the designer to the extent that the designer effectively interacts with users on behalf of companies and their products. While the infrastructure of a website incorporates the elements as a cohesive whole, interactivity also provides the functionality required for the user to engage with the information and respond to it in a way that is of their choosing. To this end, interactivity is perceived as a tool that facilitates and enables interaction.

Without a fixed context, interactivity is indeed abstract. It has the potential to take any form. Within the practice of web design, interactivity is reified with multiple functions. What is apparent are the very clear objectives surrounding the deployment of interactivity in commercial web design. Designers use their interactive literacy throughout the design process: they shape the initial concept through consideration of the purpose, functionality, design and user, and refine their design after the website is live in an ongoing process of evaluation.

The basis of commercial web design is communication. Designers use interactive literacy in developing communications that are sympathetic to the concept and communicate in one voice. For designers, interactivity is a simultaneously visible and invisible tool that empowers users to interact in ways that were not previously imagined prior to the web. For designers, interactive literacy is a practical knowledge applicable specifically in web design, but it can also be applied more broadly as a way of thinking about communication problems that span multiple media formats.

The findings from this research demonstrate that interactivity is simultaneously complex and simple. The designers perceive that interactivity can be anything, but in a practical and social context such as web design it is clear that it is a tool that enables users and designers alike to communicate in a variety of ways using

interactive features. As discussed, this research suggests that interactivity is a practice and that interactive literacy is a specialised knowledge, that combined with design intuition, enables designers to deploy interactivity in web design effectively so that it metaphorically speaks to the user. While its functionality and characteristics are subject to change, the underlying objectives of the functions and characteristics remain the same: to engage and empower the user in communication systems.

## 8.5 | The practise of good design for the web

This study presents some unique insights that help to explain the objectives and functions of communication design and the discrete practice of web design within this profession. A deeper understanding of the issues that have challenged Australian designers since the emergence of the web as a mainstream communication mode has revealed their real contributions and the degree to which they have consolidated their new knowledge in practice. This investigation into interactivity in practice has gone some way to address that challenge by demonstrating that the term has meaning for designers in the practice of doing. I will now turn my attention to the practice of web design, the contribution of designers toward shaping the web, the implications of the web for communication design, and an emerging notion of good design for the web.

Good websites require design to ensure that they communicate coherently. Good websites also require interactivity to guarantee that the content is viewed as intended and that visual objects behave and communicate as intended. Interactivity is a necessary component in web design. It is interwoven with other designed elements in a narrative or experience. Web designers do not perceive interactivity as a singular proposition but as an all-encompassing approach.

Designers' contribution to the web has been to develop websites using fundamental design principles so that they can communicate as a whole. They bring knowledge and experience of good design to the web, by which is meant a set of professional standards and a definition of tools and strategies in which form, text, image, behaviours and functionality read as an integrated whole. Designers therefore view their contribution to the web as critical in making the web human. While they do not write, or know how to program the interactive functionality of a website, they are concerned with human values and overcome their technical deficiencies with their ability to intuit the user, thereby informing the development of narrative and metaphor.

Insight into the design process demonstrates how designers perceive their role as a specialist endeavour. All of the designers I spoke with emphasised the importance of their role. They believed that clients did not yet fully understand the web or the user, and that the user did not appreciate the significance of design

in creating a seamless experience. This study therefore highlights the designers' perception of their role in web design as unique and critical because of the contribution their intuitive thinking and experience can make to the development of a humanised interactive space.

Over time a clear delineation between various specific design disciplines that share a communication imperative has emerged. The findings in this study help to clarify the distinctions between communication design, graphic design and web design. Communication design is the overarching design discipline within which graphic design and web design are distinct practices. While they share the communication imperative and fundamental design thinking skills, the media they work with display different qualities and characteristics that afford diverse communication potential. Subsequently, designers working in web design think differently about communication, narrative, behaviours and the user compared with their print design colleagues. This has ramifications for the articulation of communication design to the broader community, particularly governing bodies and educators.

Designers have established their role as mediators between the client and the user. They take on the responsibility of connecting with and understanding the users, educating clients about their profile and quirks. They move web design from a technologically determined process of information exchange to a journey that involves storytelling. Although web design and greater collaborative partnerships have forced designers to articulate their practice with clarity, this process adversely reasserts the whimsy in the design process. The designer brings a sense of magic to web design, transforming complexity into simple narratives that intersect with users and that are fresh and surprising but also empowering. Designers believe that without their profession, the web would lack soul. They apply their knowledge and experience to create memorable experiences that form a bond with the user.

## 8.6 | Concluding remarks

The strength of this study is the proposal to capture and represent a complex notion like interactivity as articulated by web designers in their daily practice. The majority of approaches to this question take a theoretical perspective and often produce abstract solutions that may not have an immediate application at the level of practice. This study takes a pragmatic approach that attempts to make explicit the tacit/enacted/ performed aspects of the practice. From this basis, this thesis makes an original and significant contribution to understanding how interactivity is practised in the field of web design.

This study examined how designers understand interactivity, revealing that they perceive interactivity as an integral part of the design process that enables

them to extend their scope of practice to consider users in more detail. This study reveals the ambiguity that occurs when designers weave their perceptions of interactivity and associated practices with discussions regarding visual language or the graphic voice. Although designers acknowledge that they have developed new knowledge and an interactive literacy, they often downplay this knowledge alongside discussions of concept, narrative, aesthetics and user groups, which suggest their concerns have remained unchanged by the web.

This research offers important insights into the distinctive contribution of communication designers in shaping the web. These designers make commercial web design a meaningful human experience through their design of narratives that motivate users to engage and participate in the broad conceptual spectrum of communication. Designing for the web requires a different approach to design for print. Although there are links to a print heritage, these relate to the traditions of good design for a print medium. In responsive environments, typographic conventions are evolving. Over the past decade a fusion has occurred, positioning web designers well to articulate what is good design for the web: establishing a set of dynamic standards, defining tools and establishing best practice.

This study provides a base for further inquiry and the production of practical resources for web designers to reflect on and extend their daily practice, making their tacit and critical processes – and therefore ways of engaging with the web – more accessible. It also represents a starting point for further research into practice theory within the context of web design.

# Appendices

## Appendix 1: Glossary

**Design process** explains the sequence of stages involved in the development of a design from initial idea through to final production and distribution. The stages of the process can vary and may encompass a research phase, concept development, idea visualisation, visual analysis and synthesis, project design, development, audience testing and production. The stages can be undertaken in a systematic way, but the transition from one to the other is normally fluid and flexible, being described as a cyclical process in which a series of recurring tasks or activities occur iteratively.

**Digital revolution** in the fields of communication design refers to impact of the introduction of the Apple Macintosh in 1984. This brought significant changes to communication design on multiple levels, particularly because the graphical user interface (GUI) and the small 14-inch personal computer differed dramatically from standard command-line computers. Coupled with Adobe's PostScript page layout system, the Macintosh computer was seen as breaking new ground in communication design practice for its onscreen representation and intuitive tools (Julier, 2000). The Macintosh changed the basis of graphic design practice by enabling all aspects of the design process and previously separate print production process to be incorporated into one process. Using the Macintosh, designers could exercise creative control over all facets of their design work including concept development, visual expression, project development, finished art, editing and typesetting.

**Embodied interaction** is a term related to web design that is used to refer to face-to-face exchanges via networked technologies, including the extent to which an interface is 'visible' and has a sense of presence.

**Good design** is a loose concept that suggests the existence of standards of practice that define designers' professional expertise. It is often used in a moralistic way to distinguish between quality design that achieves its artistic, conceptual and functional objectives and designs driven by purely commercial imperatives. Following WWII, a good design movement emerged alongside the establishment of professional associations to articulate ethics and standards in communication design. For example, the 'Swiss School' of graphic designers established a codified system for producing 'good form' (Davis, 2012). Despite such attempts, there has been debate throughout the history of communication design as to what constitutes good design.

**Graphic form** refers to how ideas are visualised and communicated through the formal elements of communication design (line, shape, colour, space, image, texture and type), the aim being for all formal elements to communicate in one cohesive expression. Within the rise of digital design, the idea of graphic form has expanded

to include how ideas are communicated visually through space and over time (Drucker & McVarish, 2009). As such, graphic form now includes behavior, sound, motion, interaction and space, although the aim remains to have them working in conjunction with each other to communicate efficiently and effectively.

**Practice** comprises designers' everyday professional activities. In the context of communication design it encompasses the creative and technical components of designing, craft and production skills and the intellectual process involved in practice that allow designers to analyze, define and resolve design problems (ICOGRA, 2008).

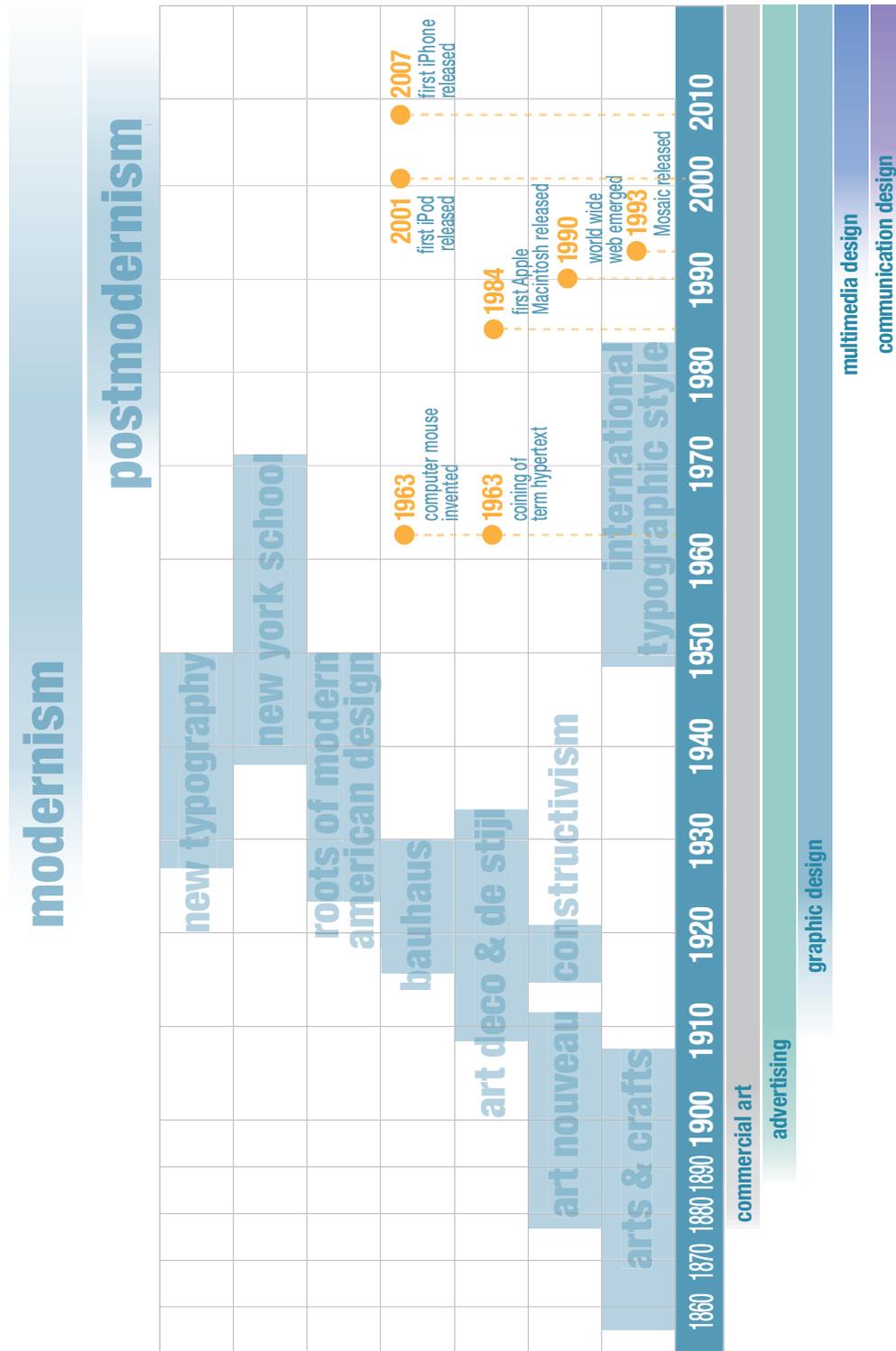
**Technology** in the context of this thesis refers to technological tools used in the practice of design that have had an impact on the communication design profession. Technology prior to the 1980s generally refers to various mechanical image reproduction methods and printing techniques. After 1984, technology refers to digital computers such as the Apple Macintosh and the software used to support designing. From the 1990s onward, the term technology expands to include networked technology used to produce or disseminate design that includes computers and hand-held devices.

**Visual language** is a system of communication using the formal elements of design, especially through their interaction. During the 1980s and 1990s, the fields of linguistics and semiotics had an impact on how communication designers understood the nature and use of the visual and the textual elements of communication design, especially in terms of the socio-cultural derivation of designers' visual language, the arbitrary nature of meaning in symbolic systems and the role of the audience in the construction of meaning (Crow, 2003; Davis, 2012). For example, Saussure's semiology focusses on the social function of the image or sign, Peirce's semiotics addresses the logical function of the image (Guiraud, 1975), and Barthes examines signifiers, layers of 'denotation' and 'connotation' (van Leeuwen & Jewitt, 2003) as well as narrative, point of view, knowledge and experience of the subject matter.

**Web design** is a complex set of practices incorporating different skills and disciplines dedicated to the conception, development and maintenance of websites. Web design emerged after the 1993 release of Mosaic, the first graphical web browser, which enabled text and image to be uploaded simultaneously to the internet. At this point, businesses and their commercial interests rapidly colonised the internet (Allen, 2012). Web design emerged in business's quest to create 'mass-market appeal' (Reid, 1995). In this thesis, web design encompasses layout, styling, information design, graphic design, motion graphics, responsive design, content generation and production.

# Appendix 2: Graphic design timeline

Adapted and re-drawn from Jan Rosicky, 2011



## Appendix 3: Interview schedule

### Familiarise

1. What is your name?
2. Age?
3. Gender?
4. What is your highest qualification?
5. How many years have you worked as a designer?
6. How long have you been using computers?

### Your practice as a designer

7. What was your formal education and/or industry experience?
  - a. *Did you train in Communication Design, Multimedia Design or other?*
  - b. *When did you finish your training?*
  - c. *Are you self-taught?*
8. Describe for me the kind of designer you consider yourself to be.
  - a. *Do you design communications / narratives / sequences / experience*
  - b. *Information Design / Systems Design / User-Centre Design / Genius design*
9. Do you design communications?
  - a. *What type?*
  - b. *How?*
  - c. *Is the communication you design essentially designing an interaction?*
10. How do you design for various media?
  - a. *What do you consider first – media or message?*
  - b. *Are you innovative in your design work? How? What aspect?*
  - c. *How innovative can you be with your work?*
  - d. *Does the client determine the media?*
  - e. *Do you consider some platforms to be more or less interactive?*
  - f. *Do you design for the web? If yes, do you write the script?*
  - g. *Do you know how to write HTML and Javascript?*
  - h. *How long have you been designing for the web?*

11. Do you design interactions?
  - a. *What type? Person to person? Person to computer?*
  - b. *Collaborative space?*
  - c. *What characterises those interactions?*
  - d. *What mediums do you use to design interactions?*
  - e. *Are the interactions designed for the user?*
  - f. *How do you evaluate whether the design or interaction is successful?*

### Your perceptions of the process

12. Would you describe the web as a more interactive medium than paper?
  - a. *How?*
  - b. *Why?*
13. Is interaction important in the design process?
  - a. *What is the most interactive aspect of the design process?*
  - b. *Do you see interaction as an integral aspect of the design process?*
  - c. *Between who and what?*
  - d. *Does interaction play a role throughout the design process or at specific times?*
  - e. *Would you call the process between user and computer an interactive one?*
14. Do you think interactivity is an important concept in design?
  - a. *Is it important for the user? User contribution?*
  - b. *Is it important for the designer? Creative control?*
  - c. *Is it important for the client? Do clients limit use of interactivity?*
  - d. *Does it bring user and designer closer together?*
15. Do you think Web Design is its own design discipline?
  - a. *Is Web Design still considered an emerging practice?*
  - b. *Does it fall under the banner of communication design, interaction design, multimedia design, advertising etc...?*
  - c. *Do you think it will become it's own discipline?*
16. Can you define/map interactivity visually?

### Website Design

17. List two of your commercial projects that demonstrate how you implement your understanding of interactivity in web design.
18. Name two self-motivated or pro bono websites that demonstrate how you implement your interactivity within web design.
19. List two websites that you find inspirational in their use of interactivity and design. What characterises their inspirational use of interactivity?

## Appendix 4: Protocol tools

# visualising interactivity

Diagrams | Websites

### INTUITIVE

- Navigation
- Metaphors
- Simulate reality

### FEEDBACK

- 2-way feedback
- 1-way feedback
- User-to-computer
- User-to-user
- User-to-many
- Reaction / Action
- Immediate

### EXPERIENCE

- Brand
- Functional
- Immersive
- Exploratory
- Simplicity
- Sensory: beautiful visuals
- Random

### USER

- Narrow user
- Broad User / Everyone

### COMMUNICATION

- Inform
- Community / Belonging / Recognition
- Interaction
- Connect / Connections

### ENABLE

- Participation
- Choice
- Making the web human
- Create
- Play

Notes

# visualising interactivity

## Interviews | Commercial Websites

### INTUITIVE

- Familiar navigation
- Metaphors
- Simulate reality
- Rules defined
- Easily accessed

### FEEDBACK

- Email contact only
- Telephone contact only
- 2-way dialogue
- 1-way dialogue
- Company-to-user
- User-to-user
- User-to-many
- Reaction to action (functional)
- Immediate
- Empowering online opinion
- Empowering offline opinion

### EXPERIENCE

- Brand
- Functionality
- Immersive
- Exploration
- Usability
- Emotive

### COMMUNICATION

- Inform
- Community / Belonging / Recognition
- Interaction
- Connect / Connections
- Enable
- Motivate
- Persuade
- Brand values
- Product information
- Reinterpreting communication

### USER

- Allow for user generated content
- User-centred design
- Narrow user
- Everyone

### ENABLE

- Participation
- Choice
- Vehicle to respond (emotional trigger)
- Making the web human
- Create
- Motivate
- Play
- Informing

# visualising interactivity

## Interviews | Self-initiated or Pro bono Websites

### INTUITIVE

- Familiar navigation
- Metaphors
- Simulate reality
- Rules defined
- Easily accessed

### FEEDBACK

- Email contact only
- Telephone contact only
- 2-way dialogue
- 1-way dialogue
- Company-to-user
- User-to-user
- User-to-many
- Reaction to action (functional)
- Immediate
- Empowering online opinion
- Empowering offline opinion

### EXPERIENCE

- Brand
- Functionality
- Immersive
- Exploration
- Usability
- Emotive

### COMMUNICATION

- Inform
- Community / Belonging / Recognition
- Interaction
- Connect / Connections
- Enable
- Motivate
- Persuade
- Brand values
- Product information
- Reinterpreting communication

### USER

- Allow for user generated content
- User-centred design
- Narrow user
- Everyone

### ENABLE

- Participation
- Choice
- Vehicle to respond (emotional trigger)
- Making the web human
- Create
- Motivate
- Play
- Informing

# visualising interactivity

## Interviews | Inspirational Websites

### INTUITIVE

- Familiar navigation
- Metaphors
- Simulate reality
- Rules defined
- Easily accessed

### FEEDBACK

- Email contact only
- Telephone contact only
- 2-way dialogue
- 1-way dialogue
- Company-to-user
- User-to-user
- User-to-many
- Reaction to action (functional)
- Immediate
- Empowering online opinion
- Empowering offline opinion

### EXPERIENCE

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- Play
- Informing

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