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EXTENDING REALITIES: CREATIVITY, ARTISTRY AND TECHNOLOGY

Chapter haiku

Objects sleep dormant,
Touch becomes change and movement,
Ideas made real.

"...the moment man first picked up a stone or a branch to use as a tool, he altered irrevocably the balance between him and his environment. [...]: the more the tools, the faster the rate of change" (James Burke, 2007)

Foreword

The story of human creativity is indivisible from the history and evolution of tools and technologies. Whilst by no means an exclusively human endeavour, the capacity for tool making is nevertheless regarded as a defining feature of human achievement and, in utilitarian terms, arguably the most recognisable indicator of human creativity. Technology is inaugurating fundamentally new patterns of human experience, understanding and meaning. With a generation emerging with increasingly ubiquitous screen-based media experience and exposure to information on a scale unprecedented in human history, new questions emerge about creative capacity, craft, imagination, and the technical knowledge necessary to create.

The nature of artistic expression when virtualised, and the parallel role of technology as both the tool and the medium, also present challenges of interpretation and understanding. At the forefront of innovation for all of recorded human history, the arts continue to play a significant role in interrogating the possibilities and the implications of new technology for creative practice, human expression and cultural interpretation. Beyond mere documentation of events, art continues to be simultaneously redefined by technology as practices as well as operating as active cultural spaces in which new realities are investigated and meanings negotiated.

The problem with technology

Pablo Picasso famously pronounced that, “Computers are useless. They can only give you answers”, and there are evident tensions in any analysis of the impact of technology on human development and artistic creativity in particular. From Socrates’ view of writing as ‘inhuman’ and something which “destroys memory [and] weakens the mind” (Plato), to Aldous Huxley’s abrupt critique that, “technological progress has merely provided us with more efficient means for going backwards” (1937), active opposition to new technologies—or *technophobia* (Weil & Rosen, 1995)—has become increasingly significant in the post-industrial era as technology increasingly transforms human society. For every passionate technical advocate and adopter, there is a strident critic.

Many concerns are born out by evidence. With medical recognition of Internet addiction, there is also emerging research highlighting the danger of ‘excessive’ use of technologies and related health risks (Saadé & Kira, 2007). With evidence of high levels of mobile phone use leading to increased stress and sleep disruption (Thomée et al., 2011), Carlsson-Paige (2012) even questions the potential for a more general negative impact of modern communications and media technology in ‘sapping’ children’s creativity and cognitive development.

In the context of art and personal creativity, technology disrupts traditional associations between artist and artwork and challenges the accepted notions of craft, skill and creation itself. The emergence of mass culture and the professionalization of artistic creativity inform blurring distinctions between art and entertainment, craft and product, and the use of technology in creative practice and artistic production raises issues of predetermination, originality and ownership. Recognising the convergence of creative arts practice and the development of fundamentally new artistic practices (Wilson & Brown, 2012; Lindauer, 1998), questions emerge about creativity, technology and artistry—as creative practitioners and artists, how should we approach the use of technology? In what way is technology mediating or inhibiting creativity? And, how might technology and the arts help to inform our understanding of what it is to create and to be creative?

Definitions

To engage meaningfully with any discussion of creativity, technology and the arts, it is necessary to acknowledge the inherent difficulty in determining precise interpretations of the terminology involved. Subject first to variation by cultural and historical context, recognised domains of human activity are considerable and in many cases themselves subject to rapid change, development and redefinition.

Creativity itself is subject to continued flexibility of specification. Whilst numerous systems have been developed for the measurement of creativity, and methods for development of creative thinking, there remains a considerable diversity of views on the nature of creativity itself. The development of creativity remains problematic and, “why some people reach a level of creative genius while others do not is still unknown” (Michael, 2001). All creativity is nevertheless connected to a domain of human knowledge or activity and a relationship with a framework is at least present in all cases and a determining factor in recognition. All creativity is ultimately derivative, a ‘social construct’ (Tornkvist, 1998, p. 10), and definable as “any act, idea, or product that changes an existing domain into [a] new one” (Csíkszentmihályi, 1997 in Clegg, 2008, p. 220).

The definition of art is more complex. The subjectivity of interpretations and diversity of cultural frames of reference reflect the historical records of art as a fluid concept with context-led definitions and understandings. From the ‘liberal’ and ‘mechanical’, to the ‘fine’ and ‘applied’, *art* remains an illusive term, subject to redefinition both historically and contemporaneously; there being inherent uncertainty in any discussion of aesthetics (Weitz, 1956).

For the purposes of this text, *art* is defined first-and-foremost as; 1. That ‘intended’ as art; 2. That widely received and conceptualised as art, and, finally; 3. That ultimately recorded or experienced as art. Heidegger, in the ‘Origin of the Work of Art’ (1950, in Heidegger, 2003), approaches the subject of art and metaphysics and concludes that art is not mere representation of reality but something itself that changes and is part of reality; something that does not simply change according to the experience of existence, but something that changes the meaning of existence itself.

As with creativity and art, *technology* is also a term with a wide range of potential meanings and interpretations. Indeed, the distinction between science and technology can itself be described as one of contention (Price, 1965). The word technology originating from the Greek *techne*, as observed by Shiner (2001), whereas the Greeks had precise language to describe so many things, there was no precise concept of ‘art’ or of ‘technology’ in the modern sense. Embracing a wide range of techniques and craft from medicine to carpentry, as with the Roman ‘Ars’, the emphasis was more on human ability rather than a specific class of objects themselves.

Paint, canvas, page, and musical instrument all constituting the technological—and indeed does the human body from an evolutionary perspective—but in the modern era, the word *technology* has become increasingly synonymous, perhaps for significant reasons of impact, with the digital realm and the associated information revolution. *Technology* can be ultimately considered in terms of a spectrum from analogue to digital, from physical to virtual. In the context of this writing, *technology* is referred to in the broadest sense of devices of implements used for the devel-

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opment of artistic expression as “tools that mediate how creative activity occurs” (Burnard, 2007).

Art, technology and craft

As observed by Anati (2009), it is through the archaeology of art that we are able to study the most “ancient forms of artistic creativity” and therefore of human creativity itself. The archaeological evidence for the ubiquity of artistic practice in all human cultures is clearly significant and whilst the record of human artistic creativity is fragmentary (Bell, 2007)—with the majority of artistic expression and decoration being lost through biodegradation and the ephemerality of moment—the records of what remains are precious and extraordinary.

Debate continues about the interpretation of ancient human art with particular uncertainty about the point of emergence of truly ‘non-utilitarian’ decoration (D’Errico, 1997); with difficulties inherent in determination of characteristics of “behavioural modernity” (Henshilwood & Marean, 2003). Zilhão (1997) identifies dating of human decorative ornaments to approximately 73,000 BCE and figurative art to 30,000 BCE, which includes examples demonstrating clear consideration of proportion, symmetry, form and the cognitive expression of mythology (Bell, 2007). The origins of art will most probably remain subject to speculation as “the power of art remains a mystery” (Funch, 1997), but the power of art as an agent of “social and political manipulation” is clear. Inferences can be drawn for how tool making emerged and gradual refinement led to increasing sophistication of craft but as observed by Bell (2007), “whatever the biological motivation behind such actions, it shows that attraction to the strange, the bright and the shapely is a common possibility in many visual systems”.

In all key respects, the art is inherently technological. Beyond exclusive focus on human body, movement and voice, the vast majority of artistic practice involves some manipulation of materials using increasingly more sophisticated secondary objects and devices. Perhaps fulfilling more utilitarian function, the invention and development of tools reveals glimpses of the same cognitive insights that drove the development of artistic expression. Indeed, an aesthetic sense of possibility or drive towards manipulation that resulted in the refinement of cutting tools and arrowheads—themselves objects of symmetry and beauty as well as functionality—may indeed have emerged through more artistic processes of ‘fashioning’ or ‘altering’. The broad scope of history in the arts is littered with technical innovation and wider impact on scientific understanding. From incremental change in painting to the incredible sophistication, codification and mechanisation of music, a symbiosis between tools and techniques has evolved over certainly tens and most possibly hundreds of millennia.

Playing with technology

All art is a consequence of solutions being found in precisely how to deal with the challenge of tools and technologies. Interaction with and manipulation of natural materials being closely related to the earliest recorded forms of artistic expression, the arts provide a dynamic record of adaptation, confrontation, experimentation and innovation. Recognising the incredible accumulated and aggregated creativity of modern digital technologies—with most people who attempt to apply these technologies for creative ends having played no part in their development—the question becomes more related to how to work, how to think, and how to do.

Echoing Picasso's famous comment that 'we are all born artists, the trick is to remain an artist as we grow up', Wolff (2009) is amongst many to advocate the power of play in developing creative ideas. Amabile (1996) devotes some considerable space to the discussion of play and playfulness in her key text 'Creativity in Context' and identifies significant psychological and educational research including Piaget (1951), Bruner (1972), Lieberman (1977), and Sutton-Smith (1972) that support the same view. Recognising that not all play is creative, Amabile also cites Gordon (1961) in arguing that all creativity nevertheless contains play, and that a focus on play improves fluency, flexibility and originality. Indeed, as discussed by Johnson (1981), the possibility of transforming ideas through adoption of different personas or identities (inherent often in the act of play) is key to developing more imaginative and more valuable ideas. Play is fun, and as Einstein famously said, "creativity is intelligence having fun".

French composer and sound engineer Pierre Schaeffer, who pioneered the application of sound recording as an art form through the emergence of *musique concrète* from the 1940s, was an advocate of play (or 'jeu') as the basis for approaching technology creatively. Whilst equally adept at the development of bespoke technological devices to achieve specific creative ends such as with the phonogene for manipulating tape loops (D'Escriván, 2012), Schaeffer, like many contemporaries, is perhaps more well known for approaching existing sound recording technologies in unusual or even subversive ways.

The concept of play here for Schaeffer was necessary given the novelty and idiosyncrasy of the experiments. The improvisational and playful experimentation was designed to sustain interest through the creative process. Whilst most composers and indeed many artists can identify periods of difficulty or struggle in the completion of a creative process, dealing with new tools and technologies can present more opportunity for frustration than familiar, or tried and tested techniques. As such, whilst focused technical refinement is a significant facet of Schaeffer's work, the principle focus remains open and experimental play. With the intention of doing things with machines for which they were not principally, or indeed at all

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designed, the unexpected is the only thing that can be expected. No play is predicated on reaching a specific outcome but is more profoundly rooted in the moment-to-moment operation of adaptable procedure. After all, whilst creativity may be achievable through planned activity, originality will only ever be the achievement of the unforeseeable.

Echoes of the same sensibility can be identified through the many other adaptations or interventions with technology both within the artistic sphere and in other contexts. The principle current application of samplers, vocoders, drum machines, and turntables in music, for example, all deviate significantly from their original designed intentions thanks to experimentation and play by users and practitioners. The arts are fundamentally predicated on the realisation of often loosely defined end goals and anticipated deviation in creative process and direction. Indeed, as observed by de Bono, “memory systems can not be creative except by mistake” (1992, p. 37) and as cartoonist Scott Adams famously said, “Creativity is allowing yourself to make mistakes. Art is knowing which ones to keep”.

In any process of applying technology in the pursuit of artistic expression, be that in the digital arts, or indeed traditional craft and physical interaction with materials, there remains a barrier between intention and expression in the resources being applied. Technology most certainly has the capacity to disrupt or to distract in ways counterproductive to creative endeavour, but the journey of refinement in digital tools is one operating at a faster and more significant rate than any other comparable human technology and the accumulated experimentation involved in the decoding of the products of engineering is so diverse and increasingly interconnected so as to become almost organic. The barriers will continue to fall. Art, technology and imagination share an increasing potential to extend realities, experiences and the fundamental meaning of creativity, practice and expression. Perhaps, as Terry Pratchett said, “It’s still magic even if you know how it’s done” (2005).

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Authors' Brief bios

Chris is Senior Learning and Teaching Adviser for the Institute for Learning Enhancement and Innovation, and senior academic in the Faculty of Arts, Design & Technology of the University of Derby in the UK. A classically trained musician and practitioner in the technological arts with over seventeen years experience of teaching in higher education, Chris has presented and published widely on the subjects of creativity, artistry, technology and education, and is an active member of the American Creativity Association, associate and Fellow of the Higher Education Academy, principle researcher of the Creative Technologies Research Group, and associate of the Digital and Material Arts Research Centre in the UK.

Michael is Senior Lecturer in Music and Programme Leader for the BA (Hons) Popular Music with Music Technology degree in the Faculty of Arts, Design and Technology at the University of Derby, UK. He holds diploma's in both Art and Music, a BSc (Hons) degree in Software Engineering, Mathematics and Music, and Masters degree in Contemporary Composition which combine to fuel his interest in computer creativity. He is a principle researcher for CTRG (Creative Technologies Research Group) with over twenty five years of teaching experience in the FE and HE sector, and an active digital artist, virtual art practitioner, composer, musician and sound designer with international professional experience in media production. As well as maintaining his professional role, he is an active member of the ACA (American Creativity Association), is published and has presented his research in multimodal creativity internationally.

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