Technological Forecasting & Social Change xxx (2013) xxx–xxx

Contents lists available at ScienceDirect

Technological Forecasting & Social Change

Art is long, innovation is short: Lessons from the Renaissance and the digital age ☆

Jonathan Sapsed [a,*], Feichin Ted Tschang [b,1]

[a] Principal Research Fellow CENTRIM, University of Brighton, 154-155 Edward Street, Brighton, BN2 0JG, UK
[b] Singapore Management University, Lee Kong Chian School of Business, 50 Stamford Road, Singapore 178899, Singapore

ARTICLE INFO

Article history:
Received 20 December 2011
Received in revised form 24 September 2013
Accepted 26 September 2013
Available online xxxx

Keywords:
Creative process
Artistic innovation
Renaissance
Digital art
Video games

ABSTRACT

Creative processes are partly stable over the ages, and partly influenced by their techno-historical contexts. In this paper we examine the effects of technology on creative effort in two historical periods separated by five hundred years: the early Italian Renaissance and the contemporary Internet age with the production of art for digital products such as video games and animation. We examine how human creative processes, or more broadly, creative work, can be conceptualized as a general nature within a complex framework of evolving practices, technologies, and social norms. Commonalities emerge by comparing these two ages. In particular, creative work can be thought of as a combinative activity, operating on motifs in culture, and bounded by their social acceptance. Second, creative work involves techniques that expand the frontier of creative output. Third, creative work involves much iteration, facilitated by the media, techniques and technologies. We examine the constants in human combinative creativity by comparing these ages, as well as how this combinative creativity and iterative activity is mediated differently by the technologies of the time.

1. Introduction

Art and technology are generally considered two vital indicators of civilization, yet their advances are typically considered separately. Technology and Innovation Studies research has generally turned its attention away from culture and the arts, yet in recent years innovation and aesthetic culture has attracted research interest. This growing interest is partly inspired by government agendas to stimulate and promote cultural industries [1,2] and 'creative industries' [3,4], in which value is understood to reside fundamentally in symbolism and culture [5]. Scholars have begun to suggest definitions and measures of 'artistic innovation' [6], 'stylistic innovation' [7] and 'soft innovation' [8]. All these are attempts to demystify the artistic creative process and reconcile it with knowledge largely derived from studies of science and technology.

This paper expresses the argument that through study of the artistic process, in particular, the process of *creative work*, and the influence of technology on it in two distinct periods of development, we may better understand the nature of that work, and how it has changed, or not changed, over time. That is, we may begin to differentiate its stable characteristics and those specific to techno-historical moments. We investigate two quite different eras of artistic expressions, both widely perceived to be revolutions and periods of explosive creativity, separated by over 500 years. The first is the Italian Renaissance, in particular the early period where the practice of drawing became an important part of the artistic endeavor. The second is the current digital age, in which art is practiced through digital tools and the Internet. We focus on digital art as practiced in a corporate professional context in entertainment industries like video games, keeping in mind the contrast with the dominant form of patronage funding of artists seen in the Renaissance [9,10].

To examine these historic episodes of formative *creative work*, we develop a framework with the following interrelated themes: (1) combinative creativity (or combination) as the core mechanism of the creative process, (2) iteration as the process

☆ Authors are listed by alphabetical order.

* Corresponding author. Tel.: +44 1273 877942; fax: +44 1273 877977.
E-mail addresses: j.d.sapsed@brighton.ac.uk (J. Sapsed), tedt@smu.edu.sg (F.T. Tschang).
[1] Tel.: +65 6828 0251; fax: +65 6828 0777.

0040-1625/$ – see front matter © 2013 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.techfore.2013.09.014

by which creative works are refined and experimented with, and (3) the production and organization of complex creative work, as the means by which creativity is embedded and realized. We discuss these in relation to the two epochs and show how there are some quite fundamental shifts occurring in the creative process due to digital technology, even while the core categories and impulses of human creativity remain stable. We will also acknowledge the broader cultural and technological environment that influences creative work.

Art, with its emphasis on symbolic, rather than instrumental value represents a relatively pure form of innovation where the application of technology is not driven by the cumulative and path-dependent trajectories familiar in innovation studies. The creative impulse is not therefore aimed at solving problems, decreasing costs, substituting for rare resources etc. but is about creating for more visceral reasons. There are of course patrons and paymasters for art that dictate outcomes, as Baxandall argues "A fifteenth-century painting is the deposit of a social relationship…. The relationship of which the painting is the deposit was among other things a commercial relationship, and some of the economic practices of the period are quite concretely embodied in the paintings" [12, p. 1], yet history suggests these client preferences are different to those that drive and shape technological trajectories. Art is heavily shaped by the cultural knowledge and norms of the time (or the artists' rejection of that knowledge, and eventual social acceptance of the new knowledge).

We view 'creative work' as the broader perspective on the activity (creative as well as those activities supporting creativity), which is influenced by the artist's cultural environment, and which leads to an effected outcome. In this way, we are consistent with the broader systems-level notions of creativity as being socially situated [12]. Creativity is often tagged to concepts such as "insight", which has been demystified through studies of incubated cognitive processing [13], the standard linear creative model of preparation, incubation, illumination and validation (early on brought to the fore by Guilford [14]), and brainstorming, studied extensively by psychologists such as Osborne [15], but whose efficacy in (what we would term) *creative work* was brought out by Hargadon and Sutton [16]. Creative biography is another perspective by which studies of creative subjects are conducted, tending to focus on the life histories and environments surrounding creative artists [17,18]. Together, these two types of study may illustrate creative work to be composed of discrete acts, or to be the accumulation of a lifetime of experiences. Our notion of *work* is influenced in part by Bourdieu's view of practice as exposing actors' constructivist (i.e. experienced-based) acts as seen in their context. Bourdieu takes this further into the notion of habitus [19]. However we focus on the creative work process as the set of practices that shape or help shape an artifact's form. We argue that to further the understanding of creative work, our perspective should also take into account combinative theories of evolution, especially views that show technological evolution to be the outcome of the accumulation of technological knowledge and the continuing combination of parts of that knowledge base [20]. Because of our focus on practices, as well as on how practices involve the accumulated contributions of successive artists, all recombining the achievements of each other, we utilize a historical approach. This involves a comparison of two case studies, but due to the very different nature of the data in the two cases, rather than develop a strict a priori research design, we initially allow the first case to suffuse and help generate a framework in connection with the literature, and then by drawing the second case "into the picture", iteratively and inductively reshape the framework, as well as develop generalities and specificities across the two cases.

Section 2 describes our methodology, including the selection criteria for the two cases, the research circumstances that led to our early insight, and the data sources. Section 2.1 discusses how we arrived at our particular framework. Sections 3 and 4 discuss each of the two cases in detail. In particular, Section 3 describes the Renaissance case, and the overall model of "creative work" that we induce from this, and Section 4 draws the comparison with the videogames case, deriving a comparison table to show the "creative constants" and changes in creative work. Sections 5 and 6 end with a discussion and implications for the literature.

2. Methodology

This section examines the approach and methods with which we investigated the two cases. Our aim in both cases is to identify those aspects of the creative work process that are constant and how these are enabled and affected by changes in technology.

To approach the research question, we selected two comparative historical episodes in which artists adopted (as well helped to create) influxes of new technologies. These were the recently emerged and burgeoning field of digital art production and that of the Italian Renaissance in Art (particularly that which was largely centered on Florence). A distinguished period of artistic and intellectual history, the Renaissance opened medieval eyes to the possibilities of science and art as a representative form. Our interest is on the creative work process itself. This paper pays especial attention to the Renaissance case to describe creative work, then to discuss it in comparison with the more recent upheaval in media seen in the digital age. In particular, we focused on the drawing practice used by artists and its associated techniques, which proves to be an excellent window into not only the creative process, but also the broader organization of the creative work. By contrasting the drawings with the final artworks, art historians have developed insights into the artists' combinative and iterative work practices and thinking processes: "*To see revealed the intricate techniques and devices actuating the design processes of the great Italian Renaissance masters is not to deny their genius, but rather to understand how fundamental a tool drawing was to their vision.*" [21, p. 11]. A wave of new tools and techniques were tested and employed during this time as well as major advances in thinking that followed from observation and experimentation, for example, single point perspective, the representation of three dimensional qualities in two dimensional space, and the anatomical and mechanical visions of Leonardo. Innovations such as these had profound cultural impacts that were to ramify through the succeeding ages.

Our second case is that of the current digital era. Why compare videogame development with Renaissance artistry? Digital artistry in the late twentieth and early twenty-first centuries again represents a technology and influence on art that has become ubiquitous. Software tools have revolutionized the

Please cite this article as: J. Sapsed, F.T. Tschang, Art is long, innovation is short: Lessons from the Renaissance and the digital age, Technol. Forecast. Soc. Change (2013), http://dx.doi.org/10.1016/j.techfore.2013.09.014