

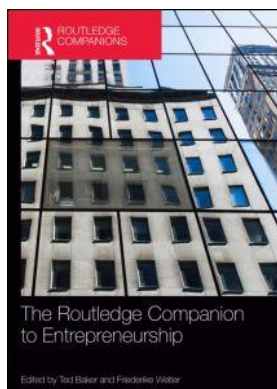
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Ted Baker, Friederike Welter

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Anne de Bruin, Erik Noyes

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Capitalizing on creativity

Insights on creative entrepreneurship

Anne de Bruin and Erik Noyes

Introduction

Creativity and a creative process that involves an artistic inspiration and an aesthetic driving force, and is also frequently coupled with a cultural aspect, are commonly thought to underpin particular human pursuits, professions and sectors. Such creativity, especially its role in economic growth, employment creation and regional economic regeneration, is now commonly grouped under the broad umbrella of creative industries. It is different from the creativity, invention and discovery associated with scientific and technological insights. It is also distinct from a wider perspective of creativity as a precursor to entrepreneurial action (Dimov 2007, Kirzner 1979) where entrepreneurial creativity is ‘the generation and implementation of novel, appropriate ideas to establish a new venture’ (Amabile 1997: 20).

The creative industries are a diverse and wide field of creative activities ranging from traditional arts and crafts, music, visual and performing arts, fashion and book publishing, to more technology intensive industries such as film, television and radio broadcasting, digital media, and more service intensive fields such as architectural and advertising services. Independent artists, microenterprises and small and medium enterprises (SMEs), as well as large corporations and multinationals, produce goods and services in the creative industries. Given this wide variety, it is not surprising that definitions of the creative industries and the activities included in the sector vary.

Definitions can be simple such as industries ‘supplying goods and services we broadly associate with cultural, artistic, or simply entertainment value’ (Caves 2000: 1). This basic definition does not, however, capture the essence of why the creative industries are of significance in the contemporary global economy. It is their knowledge and creativity elements together with the link to art, culture, and entertainment – and intersection with markets – that gives them increasing importance today. Hence they are categorized as belonging to the creative economy and ‘at the crossroads of the arts, culture, business and technology’ (UN 2008: iv). Nevertheless the debate on what exactly constitutes the creative industries remains unsettled (Flew and Cunningham 2010; Higgs and Cunningham 2008) and defining and redefining the boundaries of the creative sector has yielded difficulties for the research field (Roodhouse 2011).

The ‘creative industries’ include industries with an artistic or cultural bent and this label is commonly used in policy circles. The descriptor ‘cultural industries’, however, remains in usage especially in academic literature (e.g. Hesmondhalgh 2007; Klammer 2011) and is often used interchangeably with creative industries. Reference is also now made jointly to the ‘cultural and creative industries’ (CCIs), with subtle distinctions being drawn between the two (HKU 2010). Currently CCIs is preferred terminology in European Commission documents and reports (e.g. KEA 2012). For the purposes of this chapter, however, we use the term creative industries throughout and refer to entrepreneurship in the creative industries as ‘creative entrepreneurship’.

As economies around the world attempt to cope with the fallout from the Global Financial Crisis and the worst recessionary times experienced since the Great Depression of the last century, the creative industries become even more important as a source of employment, growth and entrepreneurial endeavour. National, regional and local initiatives are on the rise to mobilize the potential of the creative economy and to foster creative entrepreneurship.

The main aim of this chapter is to provide insights on what constitutes creative entrepreneurship and how the capacity of the creative industries might be harnessed and fostered for economic development. As such, the chapter opens with an exploration of the nature of entrepreneurship in the creative industry and proffers an initial process-oriented definition. Then, to further understanding of creative entrepreneurship at the individual level, it elaborates on the distinction between the artist and creative entrepreneur with a case example. Thereafter, the chapter investigates creative entrepreneurship beyond the micro levels of individual and firm. Specifically, the chapter analyses efforts to foster new, creative industries and creative entrepreneurs, examining national-, regional- and municipal-level support and policy. A spotlight is put on the New Zealand film industry as an exemplar of new industry creation, but other creative industries and national/regional contexts are also considered. Our methodological approach included reviewing extant literature on creative industries and leveraging industry and policy studies particularly on the film industry. We conclude by sharing observations on how to capitalize on creative entrepreneurship, including a discussion of technologies impacting creative industries, and future research opportunities.

The nature of creative entrepreneurship

The wide spectrum of creative industries makes delineating the nature of creative entrepreneurship a task fraught with difficulty. This task becomes all the more challenging when we consider that segments of the creative industries, such as the film industry, are organized in a complex way and centre on *project-based activity*. A further complication arises from the need to consider how artistic and cultural values fit into the entrepreneurship picture.

A straightforward definition proffered by de Bruin envisages entrepreneurship in the creative industries as: ‘*The process of adding value to creative inputs/creativity*’ (de Bruin 2005: 145, italics in original). This value-adding process entails combining creative inputs with other more ordinary resources or ‘humdrum inputs’ (Caves 2003), such as financial capital. For example, some creative endeavours such as a feature film require not a single but several creative inputs. The process of adding value to creativity might involve a continuing process or various stages in an evolving ‘entrepreneurial value chain’ (de Bruin 2003). An example from the music industry illustrates this: the artist composes the music but this initial creative input must then be turned into a commercial product that can be marketed. The artists might do this themselves, by burning some CDs that are personally marketed – this would be a link in the chain of adding value to the music, with the artists being entrepreneurial. Another link in the value chain might arise when an intermediary or agent enters the picture and then promotes the CD to a record label.

This agent thus contributes further to the process of adding value. When the artist is signed to the record label through the agent, and other promotional and marketing activity ensues, there is yet another link in the chain and more value is added.

Creative inputs emanate from the inspiration of artists and are different to what Caves describes as ‘*humdrum inputs* that respond to ordinary economic incentives’ (2003: 73). However, this is not to convey that creativity is only associated with the fine arts, as might be inferred from usage of the words artistic and artist, or does not emerge from economic imperatives. For instance, creativity in this sector can also emerge from intellectual capital-based *design*.¹ Penaluna et al. (2010: 663) explain that ‘unlike the fine artist, whose intrinsic and personal desires feed their creativity, the designer has to respond to problems, problems that are frequently introduced by others, yet may need re-referencing and redefining before they can be solved’. A designer’s initial ‘design briefs’ require creative solutions, yet may be customer driven. Whatever the task, it is directed toward a solution in the given context; it responds to the relevant stakeholders. The notion that creativity is design related and connected to problem solving is particularly useful when considering some distinct segments of the creative industries such as the more service-oriented sectors of architecture and advertising.

Creative industries are often integrally linked to national and/or local culture. Tin Pan Alley, for example, emerged to serve the needs of New York City’s Broadway district and the early formation of the US popular music industry. A network of music publishers, songwriters, singers and recording companies formed to create and disseminate artistic products, both harnessing and attracting area talent. These complementary links in the value chain served to enable local and regional development in this domain. Some creative products, such as *Riverdance*, a travelling international dance troop and franchise rooted in Irish culture (Ó Cinnéide 2005), may similarly exploit and market national traditions. As such, creativity frequently draws on the cultural identity of the creator/artist/designer and the groups to which these individuals belong and/or the cultural energy of nations, regions and localities, including cities. Creativity can be an expression of culture.

Consequently, we extend de Bruin’s (2005) definition to define creative entrepreneurship as: *the dynamic process of adding economic value to artistic, design or cultural inputs*. Value may be added at multiple levels of analysis, thus suggesting a tight link between creative entrepreneurs, creative enterprises of different size and specialty (which may either support or contain creative entrepreneurs), and those policymakers aiming to drive economic development. Our process-oriented definition is unlike those that focus largely on the distinctiveness of creative/cultural entrepreneurs (e.g. Klamer 2011) and instead aims to highlight how value is built and monetized in the course of a creative project, often across a network of specialized contributors.

Klamer (2011) asserts that the cultural entrepreneur is distinguished from other types of entrepreneurs by a focus on the realization of cultural values. Specifically, Klamer (2011) draws on the example of the development of the Boston Symphony Orchestra (BSO) in the nineteenth century by businessman Henry Lee Higginson, as described by DiMaggio (1982), to point out that the cultural entrepreneur is devoted to realizing art ‘as a common good’ that is shared by a group of people. It is this moral attribute, Klamer (2011: 327–28) asserts, that is one of the key characteristics of ‘a good cultural entrepreneur’. This emphasis differs significantly from the process-oriented definition explored here.

Enabling the connection between the public’s appreciation of and sharing in art and culture is also the essence of other definitions of the creative entrepreneur. Accordingly, the British Council states that creative entrepreneurs ‘bridge the gap between artists and audiences. Ranging from book publishers to music promoters, from film producers to interactive game developers, and much in between – all are key in defining what culture we consume and how we do so’

(British Council n.d.). Here, emphasis is not placed on such narrow characteristics and types of cultural brokerage but rather on the process of adding value to creative goods.

The next two sections elaborate on the distinction between activities of the artist versus the creative entrepreneur to further elucidate the nature of creative entrepreneurship at an individual level. Thereafter, we move beyond this micro level to consider the broader context of creative entrepreneurship and public initiatives at multiple levels that can assist the fashioning of new, creative industries that target economic development.

The individual level: artist versus creative entrepreneur

At the individual level, it is useful to distinguish between notions of artist versus creative entrepreneur (de Bruin 2005, 2007).² According to Howkins (2002: 129) ‘creative entrepreneurs’ are one of ten levers affecting the creativity process. They ‘use creativity to unlock the wealth that lies within themselves’. This perspective recognizes that the creative energy of the entrepreneur releases an inner element. There is, however, no explicit recognition of the impact of the external context on entrepreneurial activity. Henry et al. (2004) capture this facet in a broader notion of ‘art entrepreneurs’ who combine the intrinsic desire for creativity with extrinsic contextual and business drivers.

Schumpeter’s distinction between ‘entrepreneur’ and ‘inventor’ can provide further illumination on the difference between the creative entrepreneur and artist. For Schumpeter, ‘the inventor produces ideas’ while it is the entrepreneur who ‘gets things done’ (Schumpeter 1991/1946: 413). Schumpeter makes clear that it is the entrepreneur, rather than the inventor, who perceives opportunity, namely the possibilities for making profit, and is the catalyst in the utilization of scientific discovery and invention toward this end.

Thus an artist may be said to be a person who draws on their inspiration and inherent artistic capability to fabricate and create an embodiment of their ideas. The artist, like the Schumpeterian inventor, is the originator and gives birth to the artistic expression or creative impulse, which can take a variety of forms, e.g. new music, painting, literature or digital games by a musician, painter, author or digital designer, respectively. Yet this initial creativity has to be commercialized and turned to profit, or to borrow from Caves (2000, 2003), art must meet commerce. It is only when the artist is, in the words of Schumpeter, the one who ‘gets things done’ that they correspond to the creative entrepreneur (see also Chapter 19 in this volume).

While the Higginson and Boston Symphony Orchestra example (DiMaggio 1982) illustrates a dichotomy between the artist and cultural/creative entrepreneur, there are growing instances of a fusion between the two roles. De Bruin (2005, 2007) uses the example of Peter Jackson to epitomize this case. With several global blockbusters to his name, including *The Lord of the Rings* (LOTR) trilogy (2001–2003), *King Kong* (2005) and *The Hobbit: An Unexpected Journey* (2012) – and several Oscars to his credit – Peter Jackson is New Zealand’s best-known film director. His artistic imagination and prowess is undoubtedly a vital ingredient in his commercially successful film projects. Yet, by many criteria, Jackson is not only an artist but also an accomplished entrepreneur.

A broad perspective on entrepreneurship emphasizes the entrepreneur as an organizer of factors of production, as first highlighted by economist J.B. Say in the early nineteenth century (Glancey and McQuaid 2000). Film production requires the organization and coordination of a wide range of creative inputs and talents associated with the project (e.g. actors, scriptwriters, directors, cinematographers, costume designers, special-effects specialists, makeup artists, soundtrack and music composers, editors). This creative mix has to be combined with the humdrum inputs like financing for the project – functions encompassed in the role undertaken by film producers.

Accordingly, Jackson was director as well as producer or co-producer for several of his large and smaller projects, including *King Kong*, the *LOTR* trilogy, *The Frighteners* (1996) and *Heavenly Creatures* (1994). Jackson's entrepreneurship is also evidenced by start-up and co-ownership of several screen industry companies such as the production company *Wingnut Films*, effects company *Weta*, studio *Three Foot Six* and his hi-tech post-production facility *Park Road Post*. As such, he is more akin to Schumpeter's entrepreneur than any classic concept of an artist or inventor.

Beyond the individual and firm levels

Typically, creative individuals and firms are viewed as the economic engines in creative industries. However, recent research has pointed to the need to consider the external context or creative milieu as being important to innovation (e.g. Kresl and Singh 1999; Porter and Stern 2001). Thus, the broader global, national and local context must be considered in order to advance comprehensions of creative entrepreneurship and the formation of creative industries.

The global environment, especially technological development, exerts an important influence on growth and opportunities for contemporary creative entrepreneurship. Leadbeater and Oakley (1999) emphasize that the rapid pace of technological change, as well as the development of global brands, have been major contributory factors to the fast growth of the digital media, software and film sector in the UK. Schumpeter, when updating his earlier theory of the entrepreneur in the 1940s, stressed that the 'entrepreneurial function need not be embodied in a physical person and, in particular, in a single physical person. Every social environment has its own way of filling the entrepreneurial function' (Schumpeter, cited in Swedberg 1991: 173). Drawing inspiration from Schumpeter, de Bruin (2005, 2007) maintains that entrepreneurship in the creative sector needs also to encompass entrepreneurial activities at the national, and regional/local community levels and puts forward a multilevel framework for examining the value-adding process of creative entrepreneurship.

Entrepreneurship cannot be divorced from its broader national policy context. The state's role in creating and facilitating a broader conducive environment for entrepreneurship and the political economy of small business development is a critical consideration (Dannreuther and Perren 2013; also Chapter 24 in this volume). Within the last two decades, fostering the creative industries as part of national strategies for structural redirection toward a new knowledge economy has become increasingly common in many economies. Indicative of this policy direction has been the rising tide of new clusters of creative/cultural industries across the globe and state promotion of specialized industrial districts (Bassett et al. 2002; Chang 2008; Scott 2004; Wu 2005). Similarly, enabling production agglomerations of particular creative industries has become a fashionable component of urban, regional and local development strategies (see e.g. Indergaard 2003; Wu 2005). For instance, some East Asian countries, notably Singapore, South Korea and Malaysia, have joined Hong Kong, which already has a vigorous film and music industry, in a bid to actively grow their creative industries. Thus, Singapore, a small nation of around five million people, announced in 2002 that it would nurture 'Media 21', a cluster strategy for 'the full range of media industries, from print, broadcasting, film and new areas of convergent media such as digital and online media' (MDA Singapore 2003: 1). The intention was to position Singapore as 'Singapore Media City'. A decade later, Singapore strives to be the 'Trusted Global Capital for New Asia Media' with an updated blueprint, the *Singapore Media Fusion Plan*. Likewise, the Seoul Metropolitan Government in South Korea is developing Seoul Digital Media City as an incubator aiming to create a world-class complex for digital media industries.

Beyond national initiatives, there has been a trend towards greater activism at the regional and local government levels to promote economic development and employment growth, particularly since the 1980s. Municipal–community partnerships are important in regional development and can be vital in supporting national strategies to develop creative industries. Thus the next section elaborates on examples and multilevel elements of creating and sustaining new creative industry.

New industry

As detailed by the *Creative Economy Report 2010* (UN 2010), the cultivation of creative industries can support economic and cultural development. New industry creation offers nations and regions opportunities to harness and promote local talents while diversifying economically, often supporting tourism promotion strategies. Meziar and Kuperman (2000) draw on the historical example of the birth of the American film industry, 1895–1929, to stress the collective nature of entrepreneurship associated with industry creation. Success, they argue, depends on tapping into community synergies that comprise the population of related organizations. As such, the cultivation of creative industries requires actions and connections that supersede solo acts by individual creative entrepreneurs.

According to Forbes and Kirsh (2011: 590), ‘the emergence of new industries is an important phenomenon that remains relatively neglected by researchers’. Broadly, new industries are industries in the beginning stages of the industry lifecycle (Low and Abrahamson 1997; Van de Ven and Garud 1989). They vary significantly in the time they take to grow and stabilize, where some researchers have defined stabilization as the period when the number of firms in the industry peaks (Klepper and Grady 1990). Edmondson and McManus (2007: 1162) argue that an under-theorized area such as new industry emergence require ‘rich, detailed and evocative data [. . .] that require qualitative interpretation [. . .] to propose tentative answers to novel questions of how and why’.

New industry creation, like the development of creative clusters, is complex because an array of creative talents and organizational capabilities must be networked and/or developed. Moreover, there is also generally the challenge of promoting and distributing creative goods to wider – sometimes global – audiences in order to support the underlying strategy of industry development. Global developments can accelerate new industry creation. For instance, the recent rapid growth of the film industry and the larger screen industry agglomeration (comprising film, television, commercials, animation and post-production in the sector) beyond established centres like Hollywood epitomizes the centrifugal forces that have characterized the global industry and enhanced scope for decentralization. However, this also involves heightened competition between the various globally dispersed production centres. Pessimistically, a consequence of such intense competition, particularly for large blockbuster-budget film projects, could be that some emergent production centres are destined to die or shrink on account of the harsh competition and inherent risk that characterizes a global industry. Optimistically, however, Scott (2004: 475) argues some of these centres ‘will conceivably carve out stable niches for themselves in world markets’. In the next section, we examine the comparatively recent formation of New Zealand’s film industry as an illustration of new industry creation facilitated by multilevel support for creative entrepreneurs.

The New Zealand film industry

New Zealand (NZ) is a centre that is rapidly building a sustainable niche for itself within the globalized film industry. NZ’s youthful industry has moved rapidly from relative obscurity in

the late 1970s to an industry with global visibility and acclaim. NZ has been home to the creation of major blockbuster movies directed by New Zealanders. Noteworthy examples are Peter Jackson's *Lord of the Rings* trilogy (2001–2003), *King Kong* (2005) and *The Hobbit* (2012) as well as Andrew Adamson's *The Chronicles of Narnia: The Lion, the Witch and the Wardrobe* (2005). Notably, successes have not been confined to big-budget films. Lower cost feature films, such as the Oscar-nominated, NZ-focused film *Whale Rider* (2002) and *The Orator* (2012), the first Samoan-language feature film – which became NZ's first ever submission for the Best Foreign Language Film category of the 2012 Academy Awards – are among recent success stories. NZ short films too have contributed to film industry achievement, e.g. Oscar-nominated *Two Cars, One Night* (2003).

International filmmakers have acknowledged NZ as a good location and source of expertise and talent. Hence, NZ was the backdrop of nineteenth-century Japan for the Hollywood-directed blockbuster movie *The Last Samurai* (2004) starring Tom Cruise. Visual and physical effects production companies in NZ too have been engaged to work on increasing numbers of international films. These include *I, Robot* (2004), *The Legend of Zorro* (2005) and *The Adventures of Tintin* (2011). Assessed in terms of international recognition and acclaim, therefore, the NZ film industry has achieved success and established this new industry in a relatively short period. As such, it presents a good exemplar of new industry creation. NZ's small population and limited domestic market (around 4.4 million people), however, means that new industry development, especially for project-based, capital-intensive creative industries such as film, involves multilevel entrepreneurship and a supportive policy environment (de Bruin 2007).

A national film-friendly policy has been integral to the growth of NZ's film industry. Film and the broader screen production industry are identified by government as a major contributor to economic growth, as well as cultural development by defining and raising NZ's cultural identity profile. In 2002, the government's *Growth and Innovation Framework* selected the screen production industry as one of three strategic industries on which to focus government resources. Screen production has been the recipient of ongoing explicit and implicit government support. For example, the Large Budget Screen Production (LBSP) Grant and the Post, Digital and Visual Effects Grant provide explicit financial incentives to support filmmaking. Under the LBSP, eligible film and television productions are granted a rebate totalling 15 per cent of 'qualifying' NZ production expenditure. Attesting to support of the industry at the highest governmental level is a special deal brokered in 2010 by NZ's Prime Minister Key, between the NZ Government and Warner Bros to ensure that the two *Hobbit* movies directed by Peter Jackson would be made in NZ rather than another competing location (Key 2010). The deal not only included widening of the criteria of the LBSP Fund to make it more attractive for large companies like Warner Bros to produce films in NZ, but importantly also included industrial relations legislation to end a related labour union dispute. This deal also attests to intense global competition and the bargaining power wielded by large companies with a firmly established presence in the industry. NZ's film industry is a late-start industry that is a new entrant in a globally mature and extremely competitive industry. A conducive policy environment was vital for breaking into and surviving in this industry.

A supportive institutional infrastructure is important for building competitive advantage in new industries and markets. Hence a key strand of state support for NZ film is the state-funded NZ Film Commission (NZFC). Launched in 1978 as a cultural endeavour – just as the film industry became important for economic growth, regional development and employment – the NZFC has become an important component of the entrepreneurial efforts to build the industry. It is a risk taker, investing in the development and production of NZ-based feature films, and also promotes and sells them. In addition to state agencies like the NZFC, the institutional

infrastructural support of NZ's film industry includes industry-led bodies like Film New Zealand, the national film locations office, responsible for information provision and overall responsibility for the facilitation of screen productions. It also leads and works collaboratively with regional film offices and local government to build a film-friendly environment.

The screen/film industry is regarded as an important element of local development strategy in several regions of NZ. Local government-led, partnership-based entrepreneurial activity seeks to grow the industry in several regions. Creative industry cluster development has become a popular means of building regional screen production capacity. These developments are driven by the economic development agency arms of local and regional government and involve partnerships with central government and the private sector. For example, in Wellington there has been ongoing local government activity to ensure the region is film-friendly and supportive of the 'Creative Capital' cluster of multimedia companies. The origins of these activities may be traced to initial support of the film industry and promotional and cluster activities of Wellington City with the term 'Wellywood' coined to 'sell' the city's place in film (Jones et al. 2003).

Hence, arguably a broad prerequisite for mobilizing the development potential of a new creative industry sector is a supportive environment. In stark contrast to the institutional support in NZ is the waning Egyptian film industry. Despite a strong and mature tradition of filmmaking dating back to the late nineteenth century, and being the Hollywood of Arab cinema throughout much of the twentieth century, the industry is now under threat. Its fragile position is 'not only because of societal taboos and the rise of fundamentalism but more importantly also because of how film is viewed both by the authorities and society more generally as being outside of culture and heritage' (Joffe 2008: 179).

In sum, New Zealand's screen industry demonstrates that the development of a creative industry has complex dynamics, which transcend the individual and firms levels. The creative milieu, as well as brokers such as associations and artistic groups and interest groups, shape new industry emergence and the national/geographic footprint of industry expansion.

Technologies impacting creative industries

The digital revolution and spread of digital information and communication technologies (ICTs) are transforming the way art can meet commerce, both in film and beyond. For instance, 'the role of intermediaries is gradually disappearing or being replaced by that of the infomediarys' (UN 2008: 208). As such, there are numerous technologies with the potential to impact the development and spawning of creative industries.

Keeping up with state-of-the-art technology is vital to maintain a competitive advantage in evolving industries. For example, the NZ film industry has exploited digital technological advancements and cutting-edge motion picture technology. For instance, to convey movement fluidly, *The Hobbit* uses 'high frame rate' (HFR) video, which is twice as fast as a standard film with 48 instead of 24 frames per second. Moreover, the pre- and post-production of NZ-based films leverage a global network of talent and capabilities connected by information and communication technology.

Technology has a core role in industry creation and can alter the production, distribution or consumption of creative goods in new industries. Garud and Van de Ven's (1987) prominent model of new industry emergence focuses on the iterative cycles during which new technologies are developed, legitimized and extended to form new industries. They assert that when entrepreneurs demonstrate strong technological possibilities, even short of a final product or business, new technology-market relationships are considered, including the ultimate potential of the new technology and the range of new businesses that the technology may help create

(Garud and Van de Ven 1987; Van de Ven and Garud 1989). Thus in this section, we draw attention to the potential of radical new technologies and new business models in the creative sector. New technologies have the potential to enable new forms of creative entrepreneurship. Viewing creative entrepreneurship as a *dynamic process of adding economic value to artistic, design or cultural inputs across networks of contributors*, new technologies suggest new horizons or ways to organize entrepreneurial activity, as well as opportunities to enact novel types of social/economic systems.

Below we identify two technologies, which, combined with new business models, have the potential to generate and support creative entrepreneurs, as well as redraw the boundaries of existing national efforts to support creative entrepreneurship. Each technology presents opportunities as well as challenges to state, regional and municipal initiatives aimed at job and wealth creation through creative entrepreneurship. As a set, the technologies are compelling in that they are intrinsically globally distributed, suggesting new ways to organize, productize and monetize creative efforts.

3D printing

While *3D printing* has existed for nearly three decades, since Charles Hull's invention of a technique he called stereo lithography, the technology has now dropped dramatically in cost and attracted an army of designers, DIYers (do-it-yourselfers) and so-called 'makers', to explore the technology's potential. 3D printing enables an artist or designer to build a 3D physical object from a digital file, thus allowing for the creation of rapid prototypes or even final, functional objects. Historically, 3D printing has almost entirely been a prototyping and development tool for large industry (automotive, medical, consumer), but now it is accessible to the average consumer. In part, this is due to the efforts of those in the open source community (an idiosyncratic group of designers, artists and creative entrepreneurs), which has aimed to make the technology affordable, sharable and adaptable, thus building a platform for creative entrepreneurship.

Wohler Associates, a 3D printing consulting firm, projects that the 3D printing industry will reach \$3.1 billion worldwide by 2016 and \$5.2 billion by 2020. Interestingly, in 2012, roughly 72 per cent of objects printed currently were prototypes or developmental objects, with only 28 per cent of objects being final, functional products. However, by 2016, 50 per cent of all objects printed are expected to be final objects and ready to deliver to markets or end-consumers. As such, 3D printing is becoming a manufacturing platform, particularly for specialized products. In the coming years, we expect there will be an explosion of objects, innovations and business models to support the monetization of this creativity.

What defines the 3D printing community more than anything else is its globally distributed nature. 'Makers', i.e., those who associate themselves with the so-called Maker Movement, exist and share globally. They are motivated to experiment with new technologies and ideas for reasons of self-expression, social cohesion and entrepreneurial experimentation. A creative entrepreneur, when joining the globally distributed 3D printing community, is confronted with new models of collaboration and production as well as new distribution models for consumption. 3D printers allow creative entrepreneurs to easily consume, modify and improve goods produced by others as well as to distribute their own creations to a growing global audience, whose participation may be passive in the community (buy, print and use only) or active (buy, modify, re-share, and/or integrate into larger community endeavours).

One challenge for policymakers aiming to support creative entrepreneurship in this area is the global, decentralized nature of the 3D community. Particularly, the value of the community

and technology comes from its virtual nature and the ability to drive and promote creative projects across continents. Nonetheless, many of these digital challenges are analogous to other new media challenges, such as in film production, publishing and game design. The global nature of industry networks presents complexity in building creative clusters with a sustainable competitive advantage. Overall, we expect 3D printing will be a defining technology, opening up new possibilities for creative entrepreneurs through greater ownership and control of increasingly sophisticated production processes.

Human–computer interaction

Developments in *human–computer interaction* (HCI) we expect will have a sizable impact on creative industries and creative entrepreneurship. HCI involves the study, planning and design of the interaction between people (users) and computers. HCI can influence how artists and creative entrepreneurs interact with each other – and the communities they are targeting – suggesting new possibilities for artistic expression and potentially new ways to deliver and monetize interactive experiences.

The graphical user interface (GUI) and mouse are both critical early developments in the area of HCI, which considers relationships among *system user objectives* (both individual and communal), *user experiences*, *cognition and perception*, and *interface devices*. In the gaming industry, the Nintendo Wii was a breakout success with its novel motion-based controller, immersing gamers in physical competitions. HCI defines how humans relate with changing technology and is just as much as at play on a tablet computer as it is in wearable computing such as Google's forthcoming glasses with embedded electronic displays. While others have imagined participants attending 'virtual art galleries' and new interactions in virtual worlds, there is an explosion of new input and output technologies, where creative entrepreneurs have advantages in crafting novel, valuable experiences.

Input technologies, which artists and creative entrepreneurs may leverage, include: voice recognition, gesture recognition, face recognition, interactive visual interfaces and GPS-assisted location sensing, to identify a few. Output technologies, which are disrupting whole industries, include: tablet computers and e-readers (which are reshaping the publishing, computing, software and gaming industries) and smart devices, including smartphones, multimedia systems, and even lighting and control automation for home and industrial environments. New output technologies, which are quickly moving from the lab to the market, also include large-scale, lightweight deformable displays as well as nearly free or 'disposable' displays, which will enable new types of interaction, performance and the distribution of creative goods. Equally important, we expect new business models will emerge to support the production and distribution of unimagined creative products on these platforms. The exploding mobile and tablet app market is indicative of these developments, but only in a very narrow set of devices and form factors. In sum, we expect new types of collaboration and artistic commercialization will be enabled by developments in human–computer interaction. We anticipate new paradigms and experiences for interacting with content and community, all with the potential to fuel creative entrepreneurship.

Future research

Research on creative industries and creative entrepreneurship is embryonic but we expect that a focus on the dynamic processes of adding economic value to artistic, design or cultural inputs

can focus researchers as well as policymakers looking to build and support new industries. Future research must consider new, never-witnessed global networks of creative collaboration enabled by information and communication technology as well as creative milieus that are shaped by national, regional and local policies. Critically, we assert that research on creative entrepreneurship must move away from a focus on the micro levels of the individual and firm instead to consider complex relationships among technologies, regional and state ambitions, as well as support systems for creative entrepreneurs as exhibited through the NZ film industry example.

The inspiration of the individual artist becomes less important in this frame. Rather, the focus is shifted to the abundance and proximity of actors with the potential to create, coordinate and monetize artistic endeavours. This suggests rich opportunities for creative entrepreneurs and state players who can facilitate the emergence of broad-scoped communities while leveraging the power of novel technologies, which enable new forms of expression, interaction and commerce.

Communities of practice and networking

Wenger's 'communities of practice' notion (Wenger 1998; Wenger and Snyder 2000) we believe has particular relevance to understanding creative entrepreneurship. Particularly, the construct considers to what extent and to what commercial use is 'a very tight node of interpersonal relationships' (Wenger 1998: 76). Already some research has shown that specialist-related networks, e.g. in video game development (Cohendet and Simon 2007; Greene 2011), play an important role in supporting the growth of creative industries. Also, as we consider in examining the 3D printer community, Granger and Hamilton (2010: 51) note that 'the heart of creative entrepreneurs are the actions or relations of networks, creative workers and creative practices, which operate as "creative spaces"'. Therefore, future research should explore the unique networking practices of creative entrepreneurship.

Tensions: heart or profit?

Whether considering the impact of new technologies or communities of practice, the tensions associated with capitalizing on creativity requires future investigation. Bourdieu (1993) and Abbing (2002) point to a trade-off between cultural and commercial orientations of creative entrepreneurs. The economy of the arts is 'exceptional' (Abbing 2002) and there is a 'central paradox in creative production' when economics logics tend to crowd out artistic logics (Eikhof and Haunschild 2007). Leadbeater and Oakley (1999) show that the 'independents' they studied are driven by creativity rather than ambitious growth goals. Perhaps, the moot point is whether the tension and trade-off between commercialization and the desire for artistic authenticity of creative firms and individuals is a necessity. Poettschacher (2005: 183) eloquently claims that 'whole new maps are required for the various value landscapes of creative micro businesses in order to understand their specific dilemmas, needs and strategies'. More research is needed to identify ways of reconciling any tensions of capitalizing on creativity and following the creative heart. Is a virtuous mix of business and creative authenticity possible? How can the dual demands of artistic creativity and business outcomes be effectively managed? What are the dominant values of creative entrepreneurs in different sectors and how do these change with the size and success of enterprises? These are examples of questions relating to tensions that might arise from the juxtaposition of artistic and cultural creativity and imperatives to capitalize on this creativity. Future research needs to answer such questions comprehensively.

Conclusion

This chapter initially elucidates the distinguishing nature of creativity in the creative industries sector to provide a definition of entrepreneurship as the dynamic process of adding economic value to artistic, design or cultural inputs. This process occurs at multiple levels – individual and firm level, as well as at the overarching global, and national, regional/local levels. Together these multiple levels form an integrative framework for situating creative entrepreneurship and the process of adding value to creativity.

Arguably, at the individual and firm level, creative entrepreneurs require a conducive national and regional context for start-up and sustainable growth. Nevertheless, realization that ‘entrepreneurs exist as part of larger collectives’ is important (Mezias and Kuperman 2000: 209). As such, there is a social system of the group of organizations conducting similar activities and

also a community of populations of organizations characterized by interdependence of outcomes. Individual entrepreneurs may be more successful in the venturing process if they recognize some of the ways in which their success may depend on the actions of entrepreneurs throughout this community.

(Mezias and Kuperman 2000: 209)

Central and local governments can play a role in fostering this creative collective in various ways, such as facilitating creative clusters.

The creation and stabilization of new industries is vital for mobilizing the potential of the creative industries. However, a prerequisite for growing a project-based creative industry – such as film and the screen industry in a small domestic market like NZ – is an environment favourable to building the pool of industry skills and adding value to creative inputs. This involves ongoing efforts to ensure a continuous flow of projects to the country or region and carving out a niche in the intensely competitive global marketplace.

To conclude, we reiterate the critical importance of technological change to the creative sector and emphasize the opportunities technology presents especially for new creative industry and enterprise creation. We highlighted two technologies (3D printing and human–computer interaction) to signal the potential they hold for creative entrepreneurship. By no means do we intend to suggest that these are the only two, or even the two most important, technologies. Rather, these two technologies alone suggest compelling possibilities and new realities for efforts to drive economic development through creative entrepreneurship.

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Notes

- 1 The distinction between art and design is usually made in educational programmes in the creative arts e.g. a degree in design as distinct from say a degree in music.
- 2 Interestingly the social philosopher Arthur Koestler (1964) distinguishes three types of creative individual – *artist*, *sage* and *jester*. The artist is involved with the creation of aesthetic beauty, the sage creates ideas or solutions and humour is an act of creativity for the jester.