

Networks in the shadow of markets and hierarchies: Calling the Shorts in the Visual Effects Industry

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The nature and organisation of creative industries and the creative economy has received increased attention in recent academic and policy literatures (Florida 2002; Grabher 2002; Scott 2006a). Constituted as one variant on new economy narratives, creativity, alongside knowledge, has been presented as a key competitive asset. Such industries – ranging from advertising, to film and new media – are seen as not merely expanding their scale and scope, but as leading edge proponents of a more general trend towards new forms of organization and economic coordination (Davis and Scase 2000). The idea of network forms (and the consequent displacement of markets and hierarchies) has been at the heart of attempts to differentiate the field economically and spatially. Across both the discussion of production models and work/employment relations is the assertion of the enhanced importance of trust and non-market relations in coordinating structures and practices. This reflects an influential view in sociological, management, geography and other literatures that social life is ‘intrinsically networked’ (Sunley 2008: 12) and that we can confidently use the term ‘network society’ to describe contemporary structures and practices (Castells 1996).

Our paper is sceptical of the conceptual and empirical foundations of such arguments. We draw on a number of theoretical resources, including institutional theory, global value chain analysis and labour process theory (see Smith and McKinlay 2009) to explore how a more realistic and grounded analysis of the nature of and limits to networks can be articulated. Given space constraints, we cannot address all the dimensions of network arguments or evidence. Our focus is on inter and intra-firm relations and draws on research into a particular creative industry – visual effects – that is a relatively new though increasingly important global production network. Through this examination a different model of the creative industries and creative work emerges – one in which *market* rules and patterns of

hierarchical interaction *structure* the behaviour of economic actors and remain a central focus of analysis. The next section outlines and unpacks in more detail arguments concerning the role and significance of networks, markets and hierarchies in production models and work organisation in creative industries and the ‘creative economy’.

Networks at work?

Network arguments are utilised at a number of different levels and with respect to different empirical objects, some pertaining to industry structure and inter-firm relations, others to intra-firm relations including work and employment practices. With respect to the former, the fragmentation and disintegration of global production models has been extensively documented as a feature of new economy industries such as high-technology manufacturing, business and financial services, media and cultural industries (Scott 2006a, 2006b). A different model of production in the creative industries, originally associated with the flexible specialisation thesis (Piore and Sabel 1984), is said to have emerged from the collapse of the classical studio system. Its place has appeared a geographically dispersed agglomeration of production companies and ancillary services supporting the majors and previous studio complex employees including producers, directors and writers who have become freelance agents (Christopherson and Storper 1986; Scott 2002).

The ‘contractual’ model of business in parts of the creative industries (Caves 2000) heralds what Audretsch and Thurik (2001) have described as a shift from a ‘managed’ to an ‘entrepreneurial’ economy. Arguments about new forms of economic coordination also their theoretical origins in the Marshallian industrial district that involves dense networks of trade and exchange between small firms linked vertically and horizontally in production networks, underpinned by strong social relations such as trust and combined with dense local labour markets which are internal to the district and are characterised by flows between firms. Parallel arguments can be found in the Regional Innovation System (RIS) literature. This approach emphasises ‘untraded

interdependencies' or the 'soft institutional infrastructure' of collective learning, involving communication and interpersonal linkages, trust relations and spatial proximity between firms and institutions in a regional context (Asheim and Isaksen 2003: 36-37; Audretsch, 2002).

With respect to intra-firm relations, literatures on creative industries and labour (Florida 2002; Davis and Scase 2002; Bilton 2007) depicts a range of characteristics of work and employment amongst the creative workforce which supplements claims made about the relational characteristics of production organisation. As Thompson, Jones and Warhurst (2007) note in their critique, a frequent starting point is an *a priori* assumption that creative workers' search for autonomy and the intangible nature of intellectual assets requires and results in an abandonment of the traditional, hierarchical structures and practices of management. For creativity to be nurtured and talent realised, workers require a degree of autonomy, making 'creatives' difficult to manage. This mixture of flexibility, autonomy and intangibility results in a dramatic shift in the nature of work and employment that is consistent with the shift from hierarchical production models to dispersed systems of networked firms. The managerial task is structured by the 'war for talent' and attracting the best creative labour. Such workers are then best 'left alone' (Florida 2002: 132), or at best providing 'creative space' where work and fun become blurred and old-style 'command and control' are replaced (Coy 2000). There is an additional argument in the literature that the special kind of creativity in cultural industries – the aesthetic attributes of product and process – has significant implications for the management of work. As a result, employment arrangements must be flexible and fluid rather than structured and fixed; they must recognise the personal desire of workers to engage in aesthetics, rather than traditional structured career paths (Gibson and Kong 2005). As such, the traditional employment incentives of market economies are either redundant or insufficient to engage with creative talent.

There is widespread acceptance of the idea that a critical feature of creative industries is project based organisation; a form of economic coordination which remains predominantly exclusive to those industries, despite claims of

its spread throughout the economy (Whitley 2006). In an influential paper concerned with the London advertising industry, Grabher (2002) argues that project forms of economic coordination are associated with the development of an organisational and social 'ecology' in the city of London involving recurrent collaborative relations that are the foundation of both personal and corporate networks. Co-location of project partners is particularly important because of the short-term and unforeseeable nature of project cycles (p. 253), imply because of the convenience of recruitment of creative workers and interaction with project partners in a local environment. However, Grabher (2002) argues that the transaction cost advantages of spatial co-location of project partners and creative workers are supplemented by the network advantages of 'hanging out' in creative communities. Those who work on projects may ultimately generate a 'reputation' that allows them to have access to the core of creative projects in their district (p. 258). Knowledge sharing and innovation are therefore facilitated by skilled local labour forces that come together to form temporary teams working on projects that are the typical organisational model of new economy industries (Grabher 2002; Scott 2006a).

Unpacking the Assumptions

If we unpack the uses and conceptions of networks, we find a variety of arguments about coordination and causation. As Sunley (2007) observes in his sceptical account of 'relational' thinking in economic geography, networks have a somewhat elastic character. At one end of the spectrum, it is a generic term that refers to ties between actors and relations between different organisational 'nodes'. Everything can then be conceived as a network. This is the position taken in Coe, Dicken and Hess (2008), who argue that networks are neither new nor a third or hybrid form of economic organisation between markets and hierarchies. Whilst there is little to take exception to in this kind of view, there is, arguably, little explanatory power in the term itself.

More often, stronger and more specific claims are made that focus on network forms of governance or economic coordination manifested through long-term, interpersonal, informal, collaborative and reciprocal relations. In such forms of

cooperative governance and exchange, inter and intra-firm relations are characterised as collaborative communities (Adler, Kwon and Heckscher 2008), often accompanied by relational contracts (Grabher 2006). This model depicts territorial groupings of firms which are comprised of interdependent actors who share resources and purposes and are aware of the need for coordination. Within these spatial networks, there is a decentralisation of power and decision-making and a blurring of roles and responsibilities. Interaction occurs through decentralised forms that facilitate the exchange of narratives capturing knowledge and experience. (Grabher 2002, Storper and Scott 1989, Asheim and Isaksen 2003)

Descriptive claims about the emergence or dominance of horizontal forms of coordination are underpinned, implicitly or explicitly, by an argument about *mechanisms*. Any mode of coordination, whether inside or across organisations, requires something more than a structure to make it work. In the traditional discussion of these issues, market forms coordinate on a basis of price and competition, whilst hierarchies internalise transactions within integrated authority structures. For proponents of networks, neither is seen as effective for collaborations, sharing knowledge and developing social attachments (Powell 1990). The network coordination mechanism is conceived of as trust between actors, manifested in informal relationships and value systems.

Adler (2001: 215-16) argues that as a mechanism 'trust has uniquely effective properties for the coordination of knowledge-intensive activities within and between organization'. In his influential account we see the additional layer of argument added to the traditional and general claims of about the virtues of high trust relations and strong ties as facilitators of effective exchange. What has been added to an argument about the capacity of networks to embody interpersonal relations that support learning, and innovation, is a more contingent one concerning the congruence between trust and the properties of a knowledge intensive economy. An outcome of such perspectives is the production of a series of strong claims that make a-priori assumptions that networks have become 'foundational' units for understanding national and

global economies, displacing firms, states or other actors (Dicken, Kelly, Olds and Yeung 2001). The supposed presence of knowledge and knowledge flows is the most frequently attributed factor believed to have a causal effect on the behaviour of firms.

There are a range of potential empirical and conceptual problems with the strong version of network theorising. A key issue is the role of trust. Networks and trust are often used interchangeably, conflating structure and mechanism (see Adler 2001). Trust is clearly an important factor in facilitating and sustaining economic relations and institutions, including those of markets (Granovetter 1985) but it is questionable whether it is a mechanism specific to networks or the extent of its effectiveness as a means of economic coordination. If networks are to be conceptualised as a 'distinctive form of coordinating economic activity' (Powell, 1990 268), we have to be clearer about what is being coordinated. The primary task of economic co-ordination within and between firms is resource allocation. It is difficult to see how trust operates independently on its own as a resource allocation mechanism. Ackroyd argues that, 'It is questionable whether there are any actual examples of interorganizational relationships based purely, or even mainly, on trust. Most also seem to involve authority and other forms of coercion' (2005, 453). Ackroyd's (2002) own investigations of the structure and activities of large UK firms lead him to argue that many are conglomerate forms that can be considered a kind of decentered, but directed network. However, these networks retain power and strategic capacity at the centre or 'hub', combining elements of hierarchy and market rather than constituting a separate means of coordination

Where does this leave networks? One possibility is that network forms are more likely to coordinate 'untraded assets' such as information and knowledge. With respect to firms, this is most likely to consist of informal industry networks. There is some evidence that employees in creative and high tech sectors are also coming to rely more on informal, reputational networks to update skills and access employment (Barley and Kunda 2004). Such outcomes are consistent with the view that there is a trend towards

increased hybridity of organisational forms (Reed 2005, Alvesson and Thompson 2005). We need to utilise analytical sources that address the issue of coordination, 'without arbitrary privileging of microscale and network-centered views' (Sunley 2007: 2).

An obvious source is global value chain (GVC) analysis. The GVC offers critical insights because it is designed to capture 'coordination and control of global-scale production systems' that are highly complex and do not necessarily involve direct ownership such as single firm hierarchies (Gereffi, Humphrey and Sturgeon 2005). It is therefore able to depict the range of vertical and horizontal connections and relationships involved in the delivery of a product or service from conception through to consumption. The GVC is comprised of distinctive power dynamics involving lead firms and typically their suppliers whose behaviours are coordinated through particular organisational mechanisms (hierarchy, markets, networks) that distribute resources in the chain.

The 'relatively "parsimonious" theoretical/empirical approach of GVC research' is subject to friendly critique by Coe, Dicken and Hess (2008, 290), notably the tendency to focus on linear relationships, lead firms and the governance of inter-firm transactions. In their preferred global production network (GPN) approach, the imperative is to create a multi-level, multi-dimensional analysis that can 'encompass all relevant sets of actors and relationships' (ibid., 272). This would focus on a wider range of power relations, different positions of firms in multiple networks, intra-firm actors such as functional groups, subsidiaries and labour, as well as non-firm actors, including the state, consumers and non-governmental organisations. Opening out value chain analysis is welcome and studies such as Johns (2006) of GPNs in video games are already providing applied versions, which, as we indicated earlier treat networks as a generic form. Johns observes that the approach can examine the mechanisms of coordination and control in the value chain and therefore explicitly examines, 'how value is created, enhanced and captured, how power is created and maintained within the

production network, and how agents and structures are embedded within particular territories.’ (2005, 153).

However, concepts have boundaries for good reasons – infinite expansion of analysis and factors can result in unwieldy ‘theories of everything’ and frameworks that are extremely difficult to operationalise. This may be why Coe et al (2008) found that actual studies of GPN don’t markedly differ from their GVC counterparts. Perhaps it is a case of broadening the scope in a way that is appropriate to the empirical object or objects that are the focus of investigation. An obvious means of broadening GVC/GPN analysis is to address the influence of the political-institutional context and the relationship between government and non-government action on firm strategy (following Lane 2008). Whilst that will be a focus of other papers, here we want to focus on labour process and employment dynamics. Though this factor is included in the range of factors by Coe et al (2008), it is discussed largely in terms of labour geography, focusing on issues such as labour segmentation, organised resistance and migration. Power relations and value capture are conditioned by the dynamics of capital-labour relations in the labour process itself, notably the availability and organisation of skills and knowledge, as well as the control, coordination and intensity of work.

DATA COLLECTION AND ANALYSIS¹

This first round of data collection sought to identify the nature of the global visual effects industry and the strategies firms used to attract Hollywood work. Our first round of data collection involved in-depth interviews with 24 informants who were identified as being knowledgeable about the PDV² sector within Australia. The respondents came from PDV firms, film and digital

¹ The research reported in this paper was funded by a grant from the Australian Research Council Centre of Excellence in Creative Industries and Innovation: R. Parker and S. Cox (2007-2009) *Varieties of the creative economy: An international comparative analysis of the production dynamics and competitiveness of the digital and visual effects industry*

² PDV refers to post, digital and visual effects and is used by the sector to capture the increasing tendency for work which was once part of post-production to be undertaken before or during production. According to Screen Australia, the industry “incorporates sound and visual editing, digital effects, creation of computer-generated images (CGI), film laboratory work and duplication services”. Our research is focused specifically on digital effects and CGI.

production training institutions, and government bodies related to the film industry. Respondents were located within Queensland, NSW and Victoria. Potential interviewees were sent a letter outlining the broad focus of the study and requesting an interview, which was followed up by an email, and then a phone call. If agreeable, face to face interviews were arranged and conducted at the firm's office. We requested an interview with the person within the organisation who was most knowledgeable about the PDV industry nationally and internationally, and also was knowledgeable about their firm's specific strategies and life cycle. In most cases this person was either the firm's founder, or a general manager. Permission was sought from all respondents to name the respondent and the firm in any research reports. Interviews lasted for between one and 1½ hours and were recorded and fully transcribed. An interview with one of the main PDV firms was coded independently by two researchers. The coding categories employed were compared. In the main, there was agreement about the general categories. These were discussed, refined, and defined in preparation for further coding. The remaining main VFX firms were coded independently by the researchers. All segments were coded into multiple themes as appropriate. This was done due to the heavily intersecting nature of the interview material.

Comparison of the coding was again undertaken. The majority of coding was the same. Where there was difference in the coding, this was most usually due to one researcher coding the text into more categories than the other researcher. Both sets of coding were kept. Categories that were problematic were discussed. This was due to inadequate conceptual distinction between such categories. A further set of interviews were then coded by one researcher into the categories. Coding was conducted using NVivo 7 (QSR International, 2006), a computer assisted qualitative data analysis program. After agreement on the themes, interview segments were coded into these. After being coded into NVivo, the themes were read by the researchers. Overlap due to a lack of conceptual clarity was resolved by recoding material as necessary.

The second round of data collection involved interviews with twelve employees – six each from two main firms in the visual effects industry in Australia³. The aim of this round of interviews was to examine ways in which the dynamics of the global visual effects industry were impacting on work and employment. The interviews and analysis were conducted using the same techniques as for the first round of data collection. The third component of data collection involved the compilation of a database containing credit lists of all Australian visual effects firms that were interviewed plus other visual effects firms that we could identify. Collection was performed in two ways. First, we identified any credits listed on the company's website or other promotional material. We also collected credits listed on IMDB.com, a widely used online film database. This database includes feature films, short films, TV shows, plus a range of other formats. For each film or other credit for each company, a range of data were also collected for the purpose of capturing the characteristics of the credit.

The VFX industry: collaboration and competition

A central driver of mechanisms of economic coordination in the Australian VFX industry is the imperative for firms to 'go global'. This arises from the small and relatively stagnant size of the domestic feature film market and the shrinking television and commercial (TVC) industry: 'The TVC sector has shrunk – there is no where near the volume of large budget ads around which had reasonable VFX work because of changes in Australian content rules' (Australian VFX Firm C). Most firms that are starting up start in the TVC sector because the infrastructure costs are not as high as the film and particularly the international film market (Australian VFX Firm F).

In explaining its decision to diversify out from the Australian domestic market, one firm explained that the TVC sector is highly competitive leading to very

³ Though these interviewees represent a reasonable cross-section of job roles, for obvious access reasons they are skewed towards full-time, permanent employees. Any bias is partly offset by the fact that many of them began as freelance/contract workers.

tight margins. For some firms, this has driven their strategy to diversify out of TVC and into the global market.

The domestic market hasn't been able to sustain any growth – for us – and for the industry in general. So you'll find that; I think you'll get the same answer from pretty much everyone that we've had to look offshore to actually sustain and grow the business. And we've had to look at diversifying our base models. You know we were a TVC, a pure TVC facility up until 2002-2003. ...There is certainly no shortage of great animation facilities or great visual effects facilities. Budgets were getting trimmed by advertising agencies and that became problematic for all of us. It got to the point where we were sponsoring sort of large multinationals which was just ludicrous. (Australian VFX Firm E).

Moving into the global value chain brings with it changes in the dynamics of market competition. That market is highly competitive and such dynamics govern the relations that are formed. While most films have a visual effects outlay, it is only 20-30 Hollywood films per year that have a sizable budget, which is the source of income for specialist visual effects firms. It is these films which have large visual effects budgets – which typically amount to 30-40 percent of a \$100 million budget in a national film or 100% of an animation film such as *Happy Feet* (Animal Logic Hollywood Node, p. 35). As one firm explained it 'we're all gunning for those along with everybody else in the world is too. So it's competitive'. Australian firms are thus heavily dependent on the Hollywood market and meeting the expectations of studios on cost, quality and reliability.

This was not necessarily a characteristic of the industry in its very early stages, but emerged in recent years as it has become increasingly global. Before discussing the inter-relations of competition and collaboration, it is worth setting out the process whereby the Hollywood studios allocate work (see section on Control and Coordination of Work for additional discussion)

..an independent post supervisor working for the project actually breaks the requirements down into individual packages and provides them to the different companies based on their skills set and their capability. And then develops the linkages between the various businesses. On that basis it [*collaboration*] can work because what's sort of happened in that instance is that Illoura will have been given a bundle of 200 shorts and Complete Post will be given a bundle of 50 shots, and Animal will be given a bundle of 500 shorts, and Rising Sun will be given a bundle of 300 shorts. And that person will sort of say okay you need to communicate with these companies on any crossovers. And under those circumstances, for the most part it works. (Australian VFX Firm)

As one sector participant explained 'it's turned into an industry now and there's lots and lots of smaller places starting out every two second' (Australian Film Industry Body). Those firms without business skills have not survived because they have not had the capability to compete. One interviewee explained this industry shakeout with reference to his own experience establishing an animation business:

People came to us. I've got not business skills, I don't count myself as a businessman at all. And it just took off like a rocket. And almost any figure we named we could get for it... Well that radically changed and I lost the business as a result of all that because of competition and people undercutting us and high rivalry probably as well. (Australian VFX Firm)

The intensity of the competitive environment impacts on two dimensions of network forms or organisation described above - knowledge sharing and inter-firm collaboration. Secrecy and rivalry characterise the response of firms to market competition and greatly impede knowledge flows and collaboration. In contrast to the network literature's depiction of fluid flows of knowledge between firms embedded in social relations, firms in the VFX industry are aware of the value of their knowledge and competitive considerations affect

the nature and extent of their disclosure. For example, one firm reported that they were aware of the importance of sharing knowledge about successful business models within the sector as a means of promoting the Australian industry and ensuring its sustainability. For example, the techniques the firm uses for managing workflows are a unique capability of value to the firm's competitiveness which could provide a model for other firms in the sector. While the firm had been involved in mapping and publishing those processes within the industry in order to promote sustainable business models within the sector in Australia, it was, like other firms, cautious about giving away commercial secrets which might erode its competitive advantage: '...to be publishing all our knowledge is actually giving a lot of stuff away to our competitors. And that's just not us that's the whole industry. So it's sort of very, it's all very secret squirrel'. (Australian VFX Firm)

In a similar way, while personal, professional and corporate networks were potentially a mechanism for sharing knowledge about industry developments, these knowledge flows were also constrained by the concerns of senior management to protect the interests of their firms from competitors by withholding information that might advantage an industry rival:

Senior personnel in each of those facilities will just talk on a regular basis, find out what's going on and what's happening, share information about recruiting, sharing information about software developments or hardware developments, sharing information about what's going on in the States. [But] at the end of the day we all play our cards close to our chest. (Australian VFX Firm)

Knowledge sharing does occur, but it transpires in a deliberate and strategic manner rather than through 'flows' facilitated by trust based network relations. For example, open sourcing of software or code that makes up the 'tools' of visual effects firms has occurred in situations in which the intellectual property is not of immediate value to the firm, but it might become of value to the industry if it is further developed through the activities and inputs of a range of VFX service providers. By making it available to others, a firm will ultimately

gain an advantage from the collective development of the software throughout the industry that it could not have acquired through its own independent actions.

Competitive market rivalry affects inter-firm collaboration in disintegrated production environments in the same way that it constrains the flow of knowledge between firms. Much of the literature on networks has suggested that inter-firm collaboration is facilitated by the co-location of firms in a particular locality which enables the pooling of resources and capabilities. Whilst some information sharing does take place about technological and market developments, our data indicate that inter-firm collaboration in the VFX industry does not occur in the way that it is depicted in the network literature: 'They're not sitting there going oh well Animal Logic you're in Australia so we'll partner with you when we work. It makes no sense at all'. (Australian VFX Firm)

There are a number of reasons why it might 'make no sense'. While firms might be co-located, they typically have different organisational cultures, production systems and forms of work organisation which potentially impede collaboration. In addition, a strong motivation for workers and firms, which might be interpreted as a form of competitive rivalry, is the desire to have a sense of creative ownership over an image and reputational advantage, both of which may be lost when responsibility (and therefore credit) for an image is blurred through collaboration. Another obstacle to collaboration is the changing structure and division of labour within the industry. Traditionally post-production was divided into distinct activities, such as editing and sound, with firms specialising in particular areas and collaborating to provide complete services. In the current industry, these activities have become 'blurred' and overlap such that a collaborator would now be a competitor rather than a firm providing a different and supplementary service (Australian VFX Firm H). Most importantly and in contradiction to the network literature, is that collaboration is not the result of trust relations in dense local networks, but rather the strategic decisions of Hollywood studios. It is not the social relations linking SMEs that drive collaboration but the calculations and

directions of Hollywood studios: 'the studios will control who they want to be part of the collaborative team I anoint you, you, you; play nice together' (Australian VFX Firm)

Reputation, trust and networks in the shadow of the global market

Reputation is an important driver of the relationships in the global VFX business. Reputational 'networks' in the VFX industry in Australia are those that link VFX service providers with their customers, the Hollywood studios. While domestic film producers with tight budgets and the TVC sector might be more willing to work with VFX firms that don't have established reputations, reputation is a barrier to entry to the Hollywood market in the sense that Hollywood producers are unlikely to take the risk of distributing work to unknown operators.

Successful Australian firms have committed significant resources (time and effort) to developing and maintaining relationships with critical Hollywood decision makers. These relationships require a great deal of face to face interaction and travel to LA. As one interviewee indicated, continuous effort is necessary to maintain these relationships as they are easily lost for firms that are geographically isolated from LA.

So it's taken us the better part of six years to develop relationships where we feel like we have some sense of where the work is coming from and we constantly go there are we talk to people and it's a relationship game like anything.... Like for example I'm about to go back in another week's time to maintain contacts and follow some up. And I've been four times this year. That's probably not quite often enough probably to maintain those; contact to ... it's probably six times'. (Australian VFX Firm)

The importance of these relationships is demonstrated by the decision of one leading Australian PDV firm, Animal Logic, to establish offices in LA. The decision was driven by a desire to play a role at the 'pre-visualisation' stage of film development on the grounds that their firm is more likely to be involved in

VFX work on a film if they are involved in the design stage. As such, relationship building has become an important dimension of strategies to capture value in the global VFX production network. These reputational networks depend, in part, on close, face to face, repeated interactions between the key players. As VFX firms are service providers, building relationships with Hollywood studios is critical to capture market share. However, there is little evidence to suggest that trust is the social relation governing these connections. Reputation is established primarily through market considerations associated with quality and cost.

Reliability is a critical component of reputation in the industry. Firms indicate that an essential element in building reputation is meeting the delivery expectations of Hollywood clients. This might mean for example that firms have to have the capability to upscale on short notice if production schedules change. These capabilities work alongside those associated with creative input:

Part of what we've done over the years because we're a privately held company, we have maintained our predictability and delivery and reliability and all those kind of things with our client base no matter what ... If you start to look wobbly then you fail that kind of fairly critical test. So that's why it's interesting; it is about enterprise and it is about business enterprise as well as being about creative pursuit. Neither of them on their own is enough but it's certainly not enough just to be fabulously talented because there's a whole lot of other stuff that the buyer is buying. (Australian VFX Firm)

Firms that have good credit lists have enhanced negotiating power with Hollywood and become serious possibilities for Hollywood VFX business: 'There is certainly a thing in film where there's a credibility or a reputation gap where you need to get a certain number of credits before people will start really working with you.' (Australian VFX Firm)

Without a reputation, Australian VFX firms might only be able to access the very limited TVC or domestic film market referred to earlier. One of the market considerations that drive the decisions of Hollywood studios to form relationships with Australian firms is cost. Australian firms have a reputation for doing more with less:

Doing stuff in Australia you cut your teeth on zero budget'. 'Americans will look anywhere they can get the best value for money. Money is usually the primary consideration and then as that, I suppose they'll just get cheaper and cheaper and then they'll start to weigh it up, well am I now getting the quality for that budget. (Australian VFX Firm)

A range of other market considerations influence Hollywood's decision to carry out work in Australia including the reliability of Australian firms in delivering on time and within budget and their creative capabilities. Service providers have to meet the range of market demands, they can't operate on cost alone, 'because there's always someone cheaper'. As a leading Australian firm explained it, 'Cost is a huge component as it always is and different clients it is to a different degree but reputation and ability to deliver is hugely important'. As such, firms have to pursue the dual objectives of cost competitiveness and the need for reliability while trying to generate profits in order to remain sustainable in a highly competitive environment.

Capturing value

The complex nature of transactions in the VFX industry makes it challenging to specify the nature of service delivery in advance. As such, there is struggle between customers and VFX service providers over the meaning of completion. VFX firms operate as professional service firms and their costing structure does not involve a fixed fee or hourly rate. As such, risks associated with delays or unforeseen complexities arising from the unspecified nature of service requirements lie with the VFX firm rather than the producer/client. This has led to a tension between the VFX firm and producer: Contract variation management has globally I think been a challenge for a lot of people. How

you manage the client, especially clients who can leverage the intangible nature of delivery. What classifies as completed delivery? (Australian VFX Firm C)

A key problem for the VFX firm is in deciding how to charge for an undefined service and when to stop in response to the demands of the producer/client. This problem has intensified as a consequence of globalisation in which technology has created 'endless creative opportunities' which are difficult to value. Whereas film production involved clear steps which could be valued and costed, VFX merges a range of activities in which

...you've got this chaotic technology environment.. And you just sort of keep going around in this sort of strange whirlpool. As I said, until the producer actually says we have to stop this now and deliver. Trying to organize that chaos, trying to charge for that chaos, is something we're grappling with at the moment. (Australian VFX Firm H)

This problem is intensified for the high-end VFX firms whose Hollywood clients have leverage. A major issue for the service firm is how to cost variations which the director or producer request when they are not happy visually with the look of an effect. While high-end firms can manage this problem to some extent because of their reputation and capacity to deliver, a large proportion of DVFX firms in the sector are vulnerable to costing pressures and this threatens their sustainability. The key point for our purposes in this paper is that capturing value is not just about the manoeuvring of firms within the chain, but depends on the characteristics of creative labour and its management.

As we indicated earlier with respect to workflow, the 'reputation' of VFX firms depends on capturing value in work relations: 'Now we've all got the same tools... which makes things easier if you are bidding against a company in the States – it basically comes down to the skill of the people involved, not the hardware..' (Employee 2, Firm B)

Labour markets, work and employment relations

Employment relations are influenced by the heavy dependence of the Australian industry on the attraction of offshore Hollywood production. The characteristic features of the labour market and the labour process connected to Australian VFX firms offer insights into potential attractions of such practices for Hollywood offshore production, as well as how management achieve the delicate balance between control and creativity in the labour process. In this section we drew primarily on interviews with employees to reveal the dynamics of value capture and to move beyond a benign picture of intra-firm collaborative communities. Hollywood offshore production occurs in Australia in part because of the reputation of its live action crews or the relatively flexible nature of labour. For example, demarcation disputes have tarnished the reputation of American film crews:

There is a unionisation in America that is very unlike our unionisation and it works against the competency and certainly the reputation of the American film crews... If it's a sound cable in America the lighting guy won't touch it; move it; that's the difference. So that has created a reputation for our crews that is second to none. We're highly regarded. So as a service and a crewing industry we're we have a good reputation and that's one of the reasons they like to come here.
(Australian Film Industry Body)

However, this is not a significant factor in a post-production environment.

The talent pool and labour market networks

Formal and informal social networks certainly play a key role in facilitating job entry and circulation in the industry. Although there are some relevant qualifications and a small number of firm-level traineeships, potential employees are as much if not more likely to enter from a diverse range of technical backgrounds and informal means. The HR function appears to play a very limited role in recruitment and selection. 'Show reels' function as a kind of animated CV, showcasing the relevant technical skills. But our evidence

from interviews with employees indicates that 'cold calling' alone is seldom enough. Almost all our interviewees utilised contacts already within the industry.

..getting the job in the end is a lot more about who you know
(Employee 6, Firm A).

It's a very tight knit community and you need to know someone to get
in there really, I think (Employee 6, Firm B).

Once inside the industry, word of mouth and on-line forums such as those of the Digital Labourer's Federation, VFX Talk or High End 3D, provide the primary means of job movement and mobility. As interviewees noted, VFX remains a small industry in which many employees know each other (at least by reputation), mix at industry events and even socialise together. Sydney is one, albeit small, hub within the industry and social proximity lubricates labour market flows. Employees frequently move between the large firms, but spatial proximity should not be over-estimated. This is an international labour pool, though largely for the younger, mobile workers who either choose or are constrained to opt for short-term contracts. Within this labour flow, it is not simply who you know, but what you've done; mobility enabling the build up of credits for the show reel.

Evidence for the role of informal networks in the VFX labour market is, therefore, strong. But the underlying logics are not wholly benign. Informal social networks put a premium on normative fit into both group and company cultures. Reputation is about *attitude* rather than knowledge and technical ability. A manager at the largest Sydney firm stated that:

We're looking for people who are adaptable. We're looking for people
who can adapt to what the tool kit becomes at any point in time.
Because all you know is that the tool kit is going to change and it's
going to change fairly fast. (Australian VFX Firm D)

A persistent theme across our employee interviews puts a different emphasis. The following observation was typical:

At the end of the day, you're going to be spending 10-12 hours a day in a room with these people, so their personality is a strong component... Reputation's a huge thing because if you burn your bridges, all the companies talk together.. If they're (the studios) are going to give us \$5m worth of work, then your reputation precedes you, you need to have the ability and be trusted to actually deliver on your promises and it's the same for artists. (Employee 2, Firm A)

Informal networks were as much about (not) burning as building bridges, favouring passive adaptation and placing limits on social and value diversity. As one employee noted:

'You just wouldn't want to ditch your contract.. because the moment you did something like that everyone would know about it and you'd be labelled a troublemaker... it's probably better to pretend that you're not having any problems – ever with anyone. (Employee 3, Firm B).

A second issue is the fragmented nature of the market itself. To deal with the significant fluctuations in demand and distinctive temporal requirements of film projects, the industry relies on extensive numerical flexibility. Whilst at the moment there is large overlap between the orientations of a highly mobile, younger, (partly) global labour force and the requirements of the industry, there is no escaping the fact that disposable labour is a current condition of profitability: '... as soon a job's out of the door, you want to cut as many costs as you can. So that's why they use a lot of freelance and contractors, because as soon as the job's finished, you can let them go' (Employee 2, Firm B). Employees are realistic about this. One of few freelancers interviewed (who is on a rolling contract), commented that: 'I still consider myself as a freelancer because I know if something went sour, I'd be out within a day, sort of thing' (Employee 3, Firm B).

On a smaller scale, the industry also utilises, albeit unevenly, the cheap and sometimes free labour of younger would-be employees. A number of interviewees commented on the willingness of potential entrants to work for nothing (or little) and conversely, the willingness of firms to 'let' them do it. Some had done this themselves in their initial roles, other had observed a wider trend: 'Juniors will definitely do anything to get in... Work for free, whatever' (Employee 4, Company B). However, the ready availability of new and cheap labour and labour market insecurity is a real dilemma for firms, whose ability to establish reputation with and capture value from studios relies to a large degree on a stable core group of employees, even if they are a minority on any particular project. One interviewee expressed the dilemma clearly:

A lot of the companies will tread this line of 'we won't pay too much because there's so many people who want to do it and we can always get more people'; or 'do we pay well and look after the ones that we know we've got and we're happy with'. (Employee 6, Firm A)

The main way this is handled at the moment is to take on most of the people who become part of the core group initially on casual contracts and filter out those who do not fit technically or socially. But the dilemma remains.

Coordination and Control of work

We noted earlier the pervasive images in the literature on creative and largely unmanaged spaces. Interviewees, particularly from Company B, did often refer to the relaxed culture or organisation, contrasting it to what they believed to be more regimented regimes in other VFX firms. Reference to culture can, however, disguise a number of underlying practices and trends. Mainstream literatures have traditionally referred to the tension between creativity and control, or 'creatives and suits' (Lampel, Lunt and Shampsie 2000). This tension was evident in our managerial interviews. As one firm explained to us, a key dilemma for management is how to achieve control and coordination without 'stifling the creative process' (Australian VFX Firm E).

However, the same source explained that while the animation and visual effects side of business has traditionally been unstructured and casual – much more so than traditional postproduction – a slow and gradual process to put systems and administration into the mix ‘without messing up the balance’ (Australian VFX Firm E) was under way. Much of this can be linked to changes in the value chain context. Technological advances have allowed visual effects to move into the mainstream of film production, expanding the scope and scale of shots. At the same time, the emergence of dispersed firms across the global chain is enabling the studios to distribute work to diverse vendors. Interviews with Hollywood sources indicate that the studios have considerable budget pressures. A combination of the increased scale of operations and experience of budget overruns and poorly managed projects means that they want systems that ‘will not slip out of control’. There are two main ways to meet that objective: studios exerting power in the contract process and strengthening oversight and direction in the delivery of projects.

Both were confirmed in our employee interviews. Referring to fiercer competition and price wars, comments included:

So there’s a constant battle going on when companies just try to get jobs for less pay in total, which again forces them to deliver more work in less period of time and with less people. (Employee 3, Firm A)

... we’ll pitch on it, we’ve got the best idea: the other companies gonna go fuck, they’ll pay half price. They’ll (the studios) let you pay them half...theyre’ always seeking the cheaper one and then you’re like, you know we’d have been perfect for that job. (Employee 6, Firm B)

Unsurprisingly, work intensification was a recurring theme. The following is typical: ‘Yeah, a lot more work in the same, if not less time’ (Employee 1, Firm A). Another, employee in a supervisory role spoke of a ‘squeeze pressure’ from film production companies and advertising agencies, with ‘budgets for for projects are maybe not as flexible as they used to be’ (Employee 1 Firm B). The change is not in temporal patterns, but rather in the porosity of the working day. A 10 hour day was reported as standard, and the extra burden

as project completion nears is neither new nor unexpected: 'You know we work for two months straight, like just stupid hours. Generally sick and you know put on heaps of weight and it was just horrible. Then once it's done it's fine' (Employee 6, Firm B). Moreover, workers acknowledged that their employers were trying to regulate hours more effectively and offering appropriate time in lieu.

What about control and hierarchy between studio and firms and within firms? The picture is at one level messy and permeable given that there can be multiple mechanisms of coordination and control. Aside from the director and/or producers of a film, the studios often appoint an in-house or independent VFX house and supervisor to oversee the complex pattern work allocation and management.

Because now films, you might have 5 or 6 larger vendors a—in a film and 5 or smaller vendors, these visual effects supervisors they supervise all the different companies, but they also have their own little company and they work directly with the Director and then farm it all out and go from place to place. (Employee 1, Firm B)

Vendors therefore are liaising with and subject to the authority of more than one external source. Nevertheless, employees were absolutely consistent in how they referred to the decision-making process and its consequences. There is, as one put it, a 'creativity chain' in which 'you've got to show your supervisor this shot and then he gets it approved by that person and that person and so on' (Employee 2, Firm B). The apex of the chain is the client:

Most of the time it's all client. Like we're slowly getting into that side, but at the end of the day, even our ideas the client will sign off on.... Like on [names film] it's all client, it's just corner shots and we're just delivering what the client wants' (Employee 1, Firm A).

Referring to 'creative autonomy' as 'kind of rare', another employee (4, Firm A), observes that 'basically the decisions have already been made and you're

doing something specifically to a client's request'. Of course it is recognised that the studio and its proxies cannot 'micro-manage', so a parallel hierarchy exists within the firm that manages relations with the client and quality control with the internal teams. Typically there might be a director or overall supervisor, functional supervisors (for 2D, 3D, compositing) and possibly mini-team leaders. The internal VFX supervisor is the 'creative glue' (Employee 6, Firm A), but the other layers of supervision 'just make sure that all the little parts are coming together and that sort of thing' (Employee 6, Firm A).

These dual chains of command do not negate the individual or collective creativity of the artists involved. The production of shots is an iterative process that requires individual input, discussion, feedback and pooling of expertise. But it does constrain autonomy and lead to a more intensively managed workflow.

There's always a little bit of room, but you are always told the basic idea and what it should look like. And when you send an iteration of a shot to a client you get very specific feedback of what you should change. So there's only so much creative room. (Employee 3, Firm A)

Other than work intensification the most common theme from employee interviews was a trend towards increased specialization. Within firms, there are still generalists as well as specialists, but with added complexity comes pressures to divide tasks and streamline the sequencing: 'You focus on your bit and someone else takes the other bit, yeah' (Employee 6, Firm A).

It's definitely got more specialised. In the past you needed to have a broader skill set... But now there is literally a person for everything... and you can just focus on your niche and just improve your skill set in that area, just to be more productive. (Employee 2 Firm B)

'Because when you're running a project and you've got tight deadlines you have to have the people doing what they're good at' (Employee 1, Firm B)

Some of that specialisation is linked to a growth of more routine work. Whilst some routine work has always been present, advanced digitalization means that visual effects are increasingly applied to taking things out as well putting (spectacular) things in. A number of interviewees referred to an increase in 'clean-up' and 'touch-up', as well as repetitive 'grunt work' and 'prep work' that reflects the size of shots that have thousands of elements in them. Referring to his work in a larger Sydney firm, one employee reflected that: 'your job is so specific, sometimes you're never gonna do anything other than... cutting, just cutting out people all day, cutting out things. You know you're not going to be able to touch the candy stuff (Employee 6, Firm B). He reported that there was some more scope for development at his current firm. But a fellow employee also noted a growing sub-division into prep work done by juniors: 'The thing that's changed now is that you might have a junior person to help, to do all the prep work and rotoscoping and the stuff that's just time-consuming – that's obviously someone who isn't getting paid as much per hour..' (Employee 2, Firm B). Overall, interviewees, whilst proud of their work and pleased to see their name in the credits at the end of movies, were also realistic about ownership: 'You can't be precious about it. You've just got to finish the shot and move on. It's not your baby at the end of the day, it's someone else's baby. You've just got to do a good job and not get too emotional about it' (Employee 3, Firm B).

Conclusions

It seems to us that networks have been under-specified and over-sold as a mode of coordination. The ideal-type contrast to other modes only works when markets and hierarchies are conceived in a disembedded and de-socialised way (see Powell 1990: 270-71). Our data indicate that while there is some evidence of inter-firm collaboration and knowledge flows in the VFX industry in Australia, these forms of economic coordination are primarily influenced by market competition, hierarchical coordination and inter-firm rivalry, significantly more than trust relations. Networks – in the strong sense of the causal powers of trust relations, reputation, knowledge exchange and informal interaction – can help explain how firms acquire leverage in the value

chain, but does not explain the core mechanisms of resource allocation and coordination. In other words, whilst network relations are a useful way of understanding some practices and forms of coordination, competition within the global value chain generates largely atomistic relations within which structural differences in power and control have the primary causal influence on the behaviour of firms and economic actors. As one employee put it, “.. When you put money in the Karma bank so to speak, you bend over backwards for them... and give them what they want. Hopefully that’ll give you a bit of leverage later on for getting more work or maybe being brought in on another project’. (2, Firm A)

With respect to intra-firm relations, our data confirms wider evidence of the significance of reputation, informal networks (less for co-location) as facilitating factors for entry and mobility within labour markets. But too often (exaggerated) versions of highly mobile free agents are transposed onto misleading accounts of unmanaged creative spaces in work relations; conflating the characteristics of labour markets and processes. We have made a case that a key characteristic of firm success in the global production network is control of workflow (sometimes called ‘the pipeline’ in the industry). More complex value chains and very tight margins means that systems to keep track of what work is done, by when and who, and how much it is costing is central to capturing value. Whilst that does not eliminate reciprocity between creative workers and VFX firms, the romance of ‘collaborative community’ is likely to obscure rather than explain the dynamics.

Is this a reasonable test of a strong network argument? After all, this is still a young industry in transition and with patterns constrained by a degree of project-specificity. Given digitization and the emergence of a dispersed and increasingly global production networks, we would argue that VFX is not untypical of some creative industries, for example those in the new media sector, As Johns (2006, 157) notes, ‘As with many other cultural industries, demand in the video-games industry is difficult to estimate and the highly competitive, volatile and risky environment results which directly impacts upon the structure and evolution of GPNs’. Our central conclusion is that there is

greater hybridity in organisational forms and modes of co-ordination, but no secular, long term trend towards trust-based networks. If the latter exist, they operate in parallel with or in the shadow of markets and hierarchies

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