

## Globalization of the animation industry: multi-scalar linkages of six animation production centers

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This paper examines the change in animation production over time and analyzes the different scales of internal and external linkages among six animation production centers. Four types of producers were identified based on their roles in the animation industry and their multi-scalar linkages were investigated for similarities and differences. Several factors including production costs, local skills, government policy and domestic markets were found to affect the growth of new production centers. High value-capture occurs mostly in production centers where tacit knowledge is created. The governance of each animation production center was found to have evolved based on its unique development path within the industry's global value chain.

**Keywords:** animation industry; linkages; global value chain; subcontracting; tacit knowledge

### Introduction

Knowledge flows and innovation in the creative industry are known to concentrate in urban areas because the industry requires mutual understanding among a group of people who share similar aesthetic views and goals (Vallance 2014). Additionally, the extremely short life-cycle of cultural products – strongly related to rapid changes in consumer interest – encourages the concentration of creative industry companies. In comparison, despite being part of the larger creative industry, the production of animated films is highly globalized and shows increasing interconnectedness within and between different regions and continents, mostly due to long-standing offshore outsourcing practices (Lent 2001, Cole 2008, Yoon and Malecki 2010, Van Egeraat *et al.* 2013).

The geographically-dispersed globalized production system of the animation industry is different from the rest of the larger creative industry which continue to demonstrate a high level of active local linkages. In contrast, the production of animated films has depended on outsourcing work to offshore animation production studios since the 1970s, thus reducing production costs for labor-intensive and low-skilled tasks, e.g. coloring (Sito 2006, Tschang and Goldstein 2010, Westcott 2010, Yoon and Malecki 2010). The functional integration of remote production sites in the animation industry has intensified during the globalization of the creative

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industry's global value chain (GVC), leading to the strengthening of long distance and non-local linkages (Sturgeon *et al.* 2008).

Despite the increasing importance of multi-scalar linkages among these geographically remote locations (Vallance 2014), few studies have investigated the external relations of these far-flung animation production centers (Oliver *et al.* 2008, Van Egeraat *et al.* 2013, Parker *et al.* 2014). This article analyzes the multi-scalar linkages among geographically remote production centers within the GVC of the animation industry and answers the following questions:

- (1) Where are clients of each production center located?
- (2) How much does each production center rely on local and non-local linkages?
- (3) How have the linkages between existing and emerging animation production centers directed the flow of subcontracted work within the GVC?

The research examined the functions and roles of six types of urban animation production centers within the global animation production system and offers analysis of:

- (1) local and non-local linkages at different production cities in different countries, and
- (2) how the current animation industry GVC shapes interconnections between different geographical regions.

### **The GVC of the animation industry**

The aim of this study is to investigate local and non-local linkages within GVC of the animation industry by tracking the flow of knowledge used at various production stages. Two types of knowledge present within the creative industry were examined in this article to understand their transfer to distant production centers of the animation industry. The first type of knowledge is known as tacit knowledge and is not easily transferrable (Howells 2002, Gertler 2003). Tacit knowledge refers to non-codified knowledge through constant interaction between people (Asheim and Gertler 2005). Tacit knowledge cannot be delivered by a human trainer or a training manual. To acquire tacit knowledge, one needs to learn-by-doing through face-to-face meetings with other professionals in the industry (Howells 2002). Several recent studies have examined the importance of tacit knowledge and its transfer among creative industry people in a locality (Martin and Moodysson 2011, Van Egeraat *et al.* 2013).

The second type of knowledge is known as codified or explicit knowledge. Codified knowledge refers to knowledge that can be easily standardized and taught (Maskell and Malmberg 1999). Scientific knowledge is an example of codified knowledge that is ubiquitous (Howells 2002, Gertler 2003). This codified knowledge can be transferred relatively easily through human trainers or training manuals using language and symbols (Maskell and Malmberg 1999). In this sense, codified knowledge is less sensitive to geographical distance, and can easily become global. The easy transferability of codified knowledge has enabled outsourcing to both on-shore and offshore animation production centers. Advancement in codified

knowledge occurs through the discovery of a new method of combining or applying existing knowledge (Howells 2002, Gertler 2003, Van Tuijl and Carvalho 2014). For example, developing a new modelling process using Computer Graphic Imagery (CGI) is based on rearranging existing knowledge and needs codified knowledge rather than tacit knowledge.

There are five stages in animation production; planning (conceptualization), pre-production, production, post-production, and distribution (Figure 1). The most innovative and value-added work in the animation industry – creating new characters, story, and images – occur mainly in the early stages of production, namely the planning and pre-production stages. Tacit knowledge that is used extensively in the conceptualization and pre-production stages of animation production. It consists of generating new ideas and images, and these early production stages are rarely offshored. Tacit knowledge within the creative industry tends to be highly localized and region-specific (Grabher 2002, Storper and Scott 2009, Gabe and Abel 2011, Van Egeraat *et al.* 2013). Exchange of tacit knowledge occurs among people in a limited and particular group that who understands its cultural context, share similar aesthetic views, and work in the same area (Gertler 2003). Face-to-face contact and geographical proximity are critical to the creation and exchange of tacit knowledge (Audretsch 1998, Accominotti 2009, Oberlin and Gieryn 2015). Thus, tacit

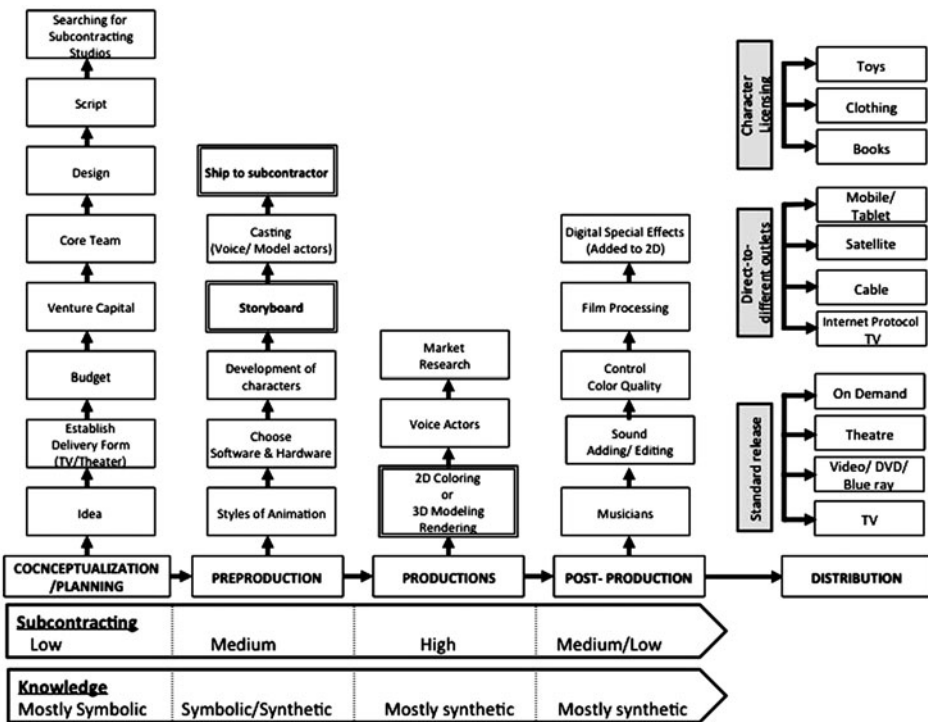


Figure 1. Production processes of the animation industry. Source: Adapted from Yoon (2008), Coe and Johns (2004), and Winder and Dowlatabadi (2011).

knowledge relies more on 'know-who' (i.e. who you know) rather than 'know-how' (Howells 2002, Martin and Moodysson 2011, Van Egeraat *et al.* 2013).

In contrast to the conceptualization and pre-production stages of animation production, the production and post-production stages use codified knowledge and are more likely to be subcontracted to remote offshore locations (Tschang and Goldstein 2010, Yoon and Malecki 2010, Van Egeraat *et al.* 2013). Outsourcing of this work is possible because the required codified knowledge can be easily transferred to other regions through codification and use of manuals. Such codified knowledge is usually acquired by on-the-job training or local technical schools.

Major animation studios often partner with or outsource to non-local firms to overcome limited local resources or to explore distant markets for their product through co-venturing and co-production deals with remote producers (Hoskins *et al.* 1995). This has long led to the dispersal of production and post-production work to off-shore studios to exploit reduced production costs for labor intensive and low-skilled tasks, like drawing background (Sito 2006, Tschang and Goldstein 2010, Yoon and Malecki 2010). Some animation studios are also known to ignore finer details in animated scenes, such as plumage of animal characters, or use close-up to blur background details to reduce production cost of outsourced work (Schuker 2010).

Non-local linkages between major studios in Hollywood and offshore animation studios have evolved significantly since the 1960s, and remote production facilities now offer a variety of services to global animation production (Yoon and Malecki 2010). As a result, non-local linkages have continued to increase between different regions of the animation industry GVC (Oliver *et al.* 2008).<sup>1</sup> Moreover, recent technological developments, especially the adoption of CGI in the animation industry has also reduced entry barriers for new business ventures within the creative industry (Tschang and Goldstein 2010, Yoon and Malecki 2010).

Despite globalization-led redistribution, old-fashioned debates such as north vs. south unevenness remain relevant within the creative industry (Mahutga 2012). Animation companies in the developed world continue to retain most of the value-added activities, while companies in developing countries usually specialize in less value-added and more labor-intensive work (Mahutga 2012, Timmer *et al.* 2014). Although reducing production costs continues to be considered important, utilizing different cultural content and targeting various regional markets and/or audience groups have emerged as major concerns for Transnational Multimedia Corporations (TMCs) (Mossig 2008, Yoon and Malecki 2010).

At present, contracts for conceptualization and pre-production stages are fulfilled at remote production centers (Korea Creative Content Agency 2012). The capabilities of overseas animation studios have increased and diversified over the years through outsourcing experience (Yoon and Malecki 2010). For example, nowadays writers in different countries are often asked to author animation stories. Similarly, designing the actual characters is also being increasingly outsourced once the animation studios in the developed countries have conceptualized the character personalities. Finally, improved air travel and telecommunication infrastructure has helped facilitate remote production (Van Egeraat *et al.* 2013). Despite this rise in offshore outsourcing, major animation studios continue to outsource work on-shore, such as post-production visual effects and audio recording.

Box office success is no longer the only goal of animation studios. Various other sources of profits related to merchandising and licensing of films products

have become major sources of revenue within the industry. The distribution stage, especially character licensing, frequently adds value within the animation industry GVC. ‘Integrated marketing’ using different products, for example videos, games, music, books and toys have been adopted widely. These different revenue streams are tied together and many TMCs generate bigger profits through ancillary and aftermarket sales, through DVD sales, and international distribution. This character licensing by itself is ‘a multibillion dollar industry’ (Alexander and Owers 2007).

The highest value capture within the animation industry GVC is the planning stage of production, one that requires high levels of tacit knowledge within a particular urban center. By contrast, other subcontracting-oriented production cities are more specialized in codified knowledge and low-skilled work involving codified knowledge. Transfer of codified knowledge is easier between suppliers and subcontractors in different regions and certainly enhances the animation industry GVCs. However, the value capture in these studios specializing in outsourced work is low, because the work is substantially less creative. Sometimes, emerging production cities within the GVC consists of hidden/shadow subcontractors who are not given official credit for their role in the production of animated films. As a result, work that requires more codified than tacit knowledge can be performed easily by several replaceable competitors.

### **Changes of the animation industry**

Over the years, the animation industry has undergone significant changes, with a major turning point at the beginning of the twenty-first century. In the past, animators mostly used hand-drawings with transparent cels<sup>2</sup> overlaid on background scenes. However, around the year 2000, animation production shifted to a new global production system involving the use of CGI. This shift in technique and technology is increasingly influenced by the global TMCs, and has resulted in a change in capabilities of many production centers.

#### ***Animation production before 2000***

Traditionally, both Hollywood and Japanese animation studios employed a strategy of vertical integration, in which the entire production process was completed in their studios (Christopherson and Storper 1989). Thus, hierarchy was the main form of governance within major animation studios before the adoption of outsourcing. However, vertical integration resulted in diseconomies of scale in terms of production costs and resulted in the internationalization of animated films in the 1970s (Lent 2001, Yoon and Malecki 2010). Initially, the parts of the production process that required large amounts of labor began to be outsourced to various local and overseas studios (Figure 1). Later, all low-skill and labor-intensive production tasks were outsourced to studios in other countries. For example, the animated TV series *The Simpsons* has been partly produced in South Korea since the late-1980s, whereas the value-added steps – planning (writing the story and character creation), post-production (adding voices and visual effects), and distribution stages – were controlled in-house by studios in the USA (Sito 2006). Conceptualization and post-production that require more tacit knowledge and a high level of creativity rarely left the original production cities (Lent 2001, Sito 2006), and task requiring codified knowledge were moved to overseas studios. As a result, two kinds of cities

existed in the global animation system prior to the year 2000: those specializing in subcontracting and global production centers (Table 1).

The characteristics of the animation industry before the year 2000 were quite distinct from what exists today. First, the cities specializing in subcontracted work emerged following the increase of outsourcing (Lent 2001, Yoon and Malecki 2010). The production work was usually limited to labor-intensive and repetitive work using codified knowledge, including coloring and drawing of cels (Tschang and Goldstein 2010). Second, only the major animation studios located in global producer cities possessed overseas subsidiaries and in-house production systems (Neupert 2011). As a result, external linkages were less important to these global producer cities compared to the previously-mentioned cities specializing in subcontracted work. A very small group of individual entrepreneurs, who had worked at major production studios in Hollywood and France, fostered these external linkages by maintaining relationships with animation studios in major production cities (Lent 2001). Third, the status of each city in the global animation production hierarchy was strongly related to the existence of a well-established local market (Bendazzi 1995). Both Hollywood and Tokyo served large domestic markets and used advantages created by their continuously growing local demands. Overall, subcontracting centers specialized in labor-intensive work and depended on subcontracting projects from global producer cities (Yoon and Malecki 2010). Thus, animation studios in subcontracting-specialized cities showed low capacity to produce original cartoons from the planning to the distribution stages because most firms in subcontracting-specialized cities were dependent on subcontracting projects from global producer studios and had only limited labor skills with codified knowledge.

### *Influence of CGI, TMCs, and capacity of remote production centers after 2000*

The introduction of CGI changed the GVCs of the animation industry remarkably. Though the total production cost remained relatively unchanged or increased, the

Table 1. The global value chain of animation production system before 2000.

Country	South Korea/Taiwan/ Australia	US and Japan
Role	Subcontractors of global producers	Original producers
Nature of knowledge	Codified/mobile	Mixed/less mobile
Linkages	Non-local (external)	Mixed
Firms	A few leading subcontractors/individual entrepreneurs	Big studios
Local factors	Labor	Well-established domestic market Contents Branding (reputation)
Strategies	Offshore outsourcing destination	Vertical disintegration/in-house production system (conceptualization, planning and post-production)
Production stage	Production (e.g. coloring)	Planning/pre-production/post production/

popularity of CGI in the animation industry increased due to two important characteristics: ‘reusability’ (Larson 2003, p. 63) and open-source nature of the software (Wood 2014). ‘Reusability’ in CGI refers to the fact that most of the data that is used in the production process can be archived and reused. CGI made it easy for animators to maintain consistency of details such as background, and made production of sequels of popular animated films and TV programs more economical. Second, the animators’ use of the same software allows code-sharing and automation of repetitive tasks. Third, the open-source nature of the CGI software has allowed many users to contribute to the continuous development and innovation within the software, and has led to increased popularity of CGI in other industries, like advertising (Wood 2014).

As CGI use has increased globally, TMCs have adopted new strategies for success.

First, mergers and acquisitions have become more commonplace. For example, Disney merged with Pixar and, in doing so, improved its CGI expertise and gained increased competitiveness in the full-length movie market.

Second, joint ventures with foreign companies and presence of subsidiaries outside of home countries have become more prevalent. Although TMCs are in theory not limited by geography, there exists international markets where TMCs are less dominant (Arsenault and Castells 2008, Hoyler and Watson 2013). Therefore, having regional subsidiaries in different countries and establishing joint ventures with their competitors or other smaller local media companies are important strategies for exploiting different regional markets (Mossig 2008, Castells 2011, Hoyler and Watson 2013).

Third, co-production with international studios is an important strategy to develop regional markets in countries with high levels of protectionism for local producers (Yoon and Malecki 2010). Thus, many international studios co-produce animated films with local animation studios to meet the minimum requirements necessary for obtaining a local broadcasting permit.

Fourth, vertically-integrated TMCs capture more market value by having greater control over character licensing and distribution channels (Lorenzen 2007, Foster *et al.* 2013). Television channels specializing in animation, such as USA-based Viacom’s *Nickelodeon*, are viewed in many countries. Unlike the USA-based channels, studios located in other countries usually sell their television series and webisodes<sup>3</sup> to overseas distributors. These distributors act as middlemen for studios and foreign broadcast companies during animation film festivals and industry trade shows. For example, Japanese animation studios have traditionally distributed their cartoons through such distributors to different countries.

Fifth, economies of scale continue to remain important in the animation production industry. In particular, it is important for a global player to have a large domestic market and a global distribution system.

While the adoption of CGI has lowered entry-barriers to the industry and created niche markets such as cartoons series for preschoolers and a huge licensing industry (Yoon and Malecki 2010), little is known about how these changes in the animation industry have influenced new emerging clusters in economically-successful countries like India and China.

### Data and methodology

A total of six production centers were chosen for this study based on their roles and functions within the global animation industry: Hollywood (Los Angeles metropolitan area), Toronto (Canada), Montreal (Canada), Dublin (Ireland), Seoul (South Korea), and Mumbai (India). These six production centers are large metropolitan areas and existing entertainment industry centers in their respective countries; the cities were found to host a total of 673 animation studios (Table 2). The roles of these six production centers in the animation industry are very different. Hollywood is a global producer, whereas Toronto, Montreal, and Dublin are regional centers that have produced a large amount of animation over the years (Westcott 2010). Seoul has been a major subcontracting center for Hollywood, Japan and other European countries for a long time; the role of Seoul in the global animation industry is that of an offshore outsourcing hub. Dublin serves the same role as Seoul for many European animation clients (Van Egeraat *et al.* 2013). Mumbai, in addition to being the center of the Bollywood motion picture industry, is an example of an emerging center of CGI subcontractors.

Location of and linkages among animation firms in production cities are two important sets of data that describe the functioning of the animation production GVC. Unfortunately, standard industrial classification systems do not distinguish between the larger motion picture industry and, one of its subset, the animation industry. Dai *et al.* (2012) used job advertisements on a professional social media site of Beijing and Shanghai to create locational patterns and Tschang and Goldstein (2010) and Van Egeraat *et al.* (2013) relied on interviews with businesses to analyze the social networks of animators. However, those methods are not sufficient to generate information about linkages between different production locations. One of the most publicly-available lists of animation production studios could be found on the Animation World Network website (Animation World Network 2010),

Table 2. Numbers of animation studios by region.

Region	Data source	Country	City	Number of animation production companies	Number of companies with clients information	Number of total linkages
North America	Animation World Network	Canada	Toronto	121	47	386
	Animation World Network		Montreal	57	19	128
	Animation World Network	US	Los Angeles (Hollywood)	309	104	899
Europe	Animation World Network	Ireland	Dublin	30	15	133
	AnimationIreland					
Asia	Animation World Network	India	Mumbai	70	27	216
	Animation World Network	S. Korea	Seoul	86	44	212
	Animation World Network Korea Creative Content Agency					
Total				673	256	1974

Source: Data collected by author (Animation World Network 2010; Korea Creative Content Agency 2012; AnimationIreland 2015).



a professional online directory of animators and related businesses. The website contains information about animation companies, such as their location and expertise, but additional information, such as their projects and lists of clients, are not available on this website.

The online directory of Animation World Network was a major data source for this research to contain the location information of 4400 animation production companies from 93 countries. However, since information on the Animation World Network website is presented in English, data on studios in some non-English speaking countries, particularly Japan, is not comprehensive.<sup>4</sup> Next, the names of South Korean animation production companies were collected using the online directory of the Korea Creative Content Agency website (2012), and the names of Irish animation studios were collected from the Animation Ireland website (AnimationIreland 2015). These various sources of information were collated into a single database.

Following the creation of a database of company names, information was obtained about each animation studio's projects and clients by visiting the company website. Information about past and current projects was collected from the studio websites followed by location information of their clients from the clients' websites. The clients of these animation studios produced the final products in the form of full-length animated movies, full-length and short television series, animated educational films, and television commercials.

There were two different constraints in the collection of clients' location data. Firstly, the location information collected by the author only represented the companies that own the copyright of the animated product. In the case of production of animated television series, majority of animation studio websites provided only the project titles. Thus, it was impossible to obtain detailed information about independent media agencies that owned distribution and broadcasting rights or television channels that broadcasted the animated series. Second, in the case of animated commercials, most studios provided the names of the products and their parent companies. Thus, clients' locations for these animated products were these organizations. After collecting details about location, expertise, clients and projects of animation studios, linkages were drawn between firms in these six cities and categorized into five different types based on the geographic location of their clients, scale of production, and relations with Hollywood (Tables 2 and 3). Each project was counted as a single linkage, and locations of clients were categorized into local, national, regional, global and Hollywood linkages. If clients were located in the same local area and country, the linkages were counted as local and national respectively. Regional linkages included clients on the same continent or the same regional economic block, e.g. Europe. Global linkages contained clients located on different continents. The overwhelming influences of Hollywood cannot be overlooked given its market size and status; so linkages to Hollywood clients were analyzed separately from other global linkages.

### **Spatial dimensions of the linkages of six cities**

Linkages between each production center and clients are divided into five types by scale and path-dependence on Hollywood: local, national, regional, Hollywood, and non-Hollywood global (Tables 3 and 4).

Table 3. Linkages of major centers in the animation industry.

Type	Hollywood (%)	Toronto (%)	Montreal (%)	Dublin (%)	Seoul (%)	Mumbai (%)
Local	449 (50.0)	65 (16.8)	30 (18.6)	31 (23.3)	292 (57.5)	80 (49.7)
National	338 (37.6)	106 (27.5)	31 (19.3)	5 (3.8)	4 (0.8)	13 (8.1)
Regional	28 (3.1)	100 (25.9)	19 (11.8)	46 (34.6)	65 (12.8)	
Hollywood		80 (20.7)	14 (8.7)	10 (7.5)	87 (17.1)	12 (7.5)
Global	84 (9.3)	35 (9.1)	67 (41.6)	41 (30.8)	60 (11.8)	68 (42.2)
Totals	899 (100)	386 (100)	161 (100)	133 (100)	508 (100)	161 (100)

Notes: Local = within a same metropolitan area. National = linkages with companies in the same country but not in a same metropolitan area. Regional = linkages with companies in the same regional economic block, ex. EU, North America, or neighbor countries. Hollywood = linkages with companies in Hollywood (Combined statistical area). Global = linkages with companies in other countries besides above regions.

### **Hollywood: a global producer**

Animation production in Hollywood is dominated by local linkages (50%) drawing on the high concentration of film studios and other animation production contractors in southern California with its abundance of well-trained labor. Hollywood also shows a high level of regional linkages (37.6%) with other production centers in North America. Animation studios in foreign countries are subcontractors of Hollywood and not clients.

For global producers, such as Hollywood and Tokyo, local and national demand has been the major impetus for growth in their early stages and continues to be important markets to TMCs. These production centers represent a localized, agglomeration economy of cultural industries based on a high level of creativity and local embeddedness (Rekers 2012). Animated studios at the local scale show high heterogeneity – freelancers, small and medium-sized studios, and TMCs. Due to their long history in animation production, co-location facilitates local linkages in the cluster, but sometimes also led to path-dependency because of long-term relations among local studios (Britton *et al.* 2009). Thus, animation studios in places like Hollywood rely more on local resources including funding, the ‘know-who’ type of knowledge, and the local buzz like rumors and word of mouth information (Storper and Venables 2004).

The global producers maintain a high level of value capture within the animation production GVCs. Hollywood animation studios have successfully appealed to global audiences through the branding of their animated films for decades; this has resulted in Disney cartoons and Japanimation achieving global brand status among animated films. For example, the consistency of Disney with characters, color schemes and simple narratives has enabled people to affirm their loyalty to Disney cartoons (Artz 2005). The producers of these global brands are renowned for their quality and images (Pike 2013). Animation studios in these production centers also own intellectual property related to character licensing from the original animated films (Yoon and Malecki 2010). Therefore, brand and branding allows the addition of more value to the final products and stable, global distribution outlets within the TMCs reduces risks in global markets.

Table 4. Animation production cities after 2000.

Cities	Mumbai	Seoul	Toronto, Montreal and Dublin	Hollywood
Role	New global subcontractor	Transitioning global subcontractor	Less-known TV series makers	Global producers
Types of knowledge	Codified/mobile	Mixed	Mixed	Mixed
Local linkages	High	High	Middle	High
National linkages	Low	Low	High	High
Regional linkages	Low	Decreasing	High	Low
Hollywood linkages	Low	High	High	NA
Global linkages	High (Europe)	High	Low	Low
Local factors	Labor	Skilled labor	Know-how (from subcontracting/co-production)	Path-dependence
	IT industry (Mumbai)	Know-how (from subcontracting/co-production)	Government policy support	Local talents
	Limited local market	Government policy support	Original TV series and independent films	Big local and national market
	Low production cost	Increasing local demand	Path-dependence on global producers	TMCs
Strategies	Co-production	Long term relations (subcontracting)	Geographical, and cultural proximity (for clients in US and Europe)	Distribution channel
		Geographical, and cultural proximity (for clients in Tokyo)	Co-production	Capturing high value chain in preproduction stage and aftermarket (integrated marketing)
		Co-production	Developing niche markets (Children's TV animated films)	Global brands
		Developing niche markets (Children's TV animated films)	Planning/pre-production/post production/distribution channels	
Production stage	Pre-production/Production (low-skilled CGI)	Planning/pre-production/production	Planning/pre-production/post production/distribution channels	

### **Toronto, Montreal and Dublin: TV series makers**

Compared to Hollywood, local linkages are relatively weak in the case of Toronto (16.8%), Montreal (18.6%) and Dublin (23.3%). Non-local linkages – in the form of Hollywood, regional, and global linkages – appear more frequently in the analysis of the animation industry in these three cities. For example, animation studios in Toronto are mostly involved in projects for Hollywood (20.7%) and regional (USA clients excluding Hollywood) clients, (25.9%), or Canadian (national) clients (27.5%). In comparison, global linkages from Toronto are much less (9.1%), with some clients in Japan, Europe and Mexico. In contrast to Toronto, global linkages are stronger in the case of Montreal (41.6%), and Dublin (30.8%). In the case of Montreal, many animation studios have European clients. Animation studios in Dublin also showed high dependency on regional clients in Europe (34.6%), particularly the United Kingdom, Germany and Italy countries that have large local markets. None of the cities have reached the status of either Hollywood or Tokyo in the animation industry yet, but they are very productive in terms of animated TV series. They have produced several good quality television series at reasonable production cost, but studios in all three cities have struggled to obtain production credits in original animated films marketed to global audiences (Levine 2009, Van Egeraat *et al.* 2013).

The most important factors in these three cities are geographical, cultural and linguistic proximity to clients in the USA and Europe respectively, both known for their world class producers of animation. Moreover, global producers, particularly Hollywood, have influenced development of animated production in these three cities. Thus, regional and global linkages are more important than national linkages for production centers like Toronto, Montreal, and Dublin. Additionally, Canadian and Irish government policy has been important for animation production in their respective countries. Both the National Film Board of Canada and Irish Film Board provide tax incentives for local animation businesses and direct investment using international coproduction treaties, and these government initiatives have generated new and experimental creativity within the animation industries of Canada and Ireland (Westcott 2010, Rekers 2012, Crane 2014, Irish Film Board 2015).

However, despite government policy that has supported the growth of these less-known animation cities, innovation and value capture is still the domain of – famous cities, e.g. Hollywood. The animation studios in these cities are more dependent on ongoing partnerships and contracts with global producers and the focus is strongly on non-local linkages.

### **Seoul: a transitioning global subcontractor**

Animation studios in Seoul have been subcontractors for animation studios based in Hollywood and Japan since the 1970s. The analysis of linkages for animation studios in present-day Seoul, however, shows that transactions with local clients (57.5%) are greater than any of the other types of linkages. While subcontracted work from international companies has decreased, non-local linkages, in particular with clients in Hollywood (17.1%) and regional and global clients including Japan (15.8%) and Europe (11.2%), have increased. In contrast to strong local linkages, the percentage of national linkages in Seoul is the lowest among the six centers (0.8%). This demonstrates a high concentration of entertainment businesses in the Korean capital city.

Before the year 2000, animation studios in Seoul were predominantly offshore outsourcing contractors for Hollywood and Japan, but have shifted since then to the production of short, animated commercials for local clients, original animation series for television, and co-production with international studios. South Korea has a wide diversity of well-trained animators due to its long history of providing subcontracting services to the animation industry. However, younger animators are less likely to take on the less creative tasks common in traditional subcontracting studios (Yoon and Malecki 2010). The importance of subcontracting to the whole industry has also decreased with increasing labor costs in South Korea.

At present, animation studios in Seoul are neither leading global producers nor typical subcontractors. Some of Seoul's animation studios have exploited niche markets, especially films for preschoolers, but are yet to have fully developed content for a wide range of audience groups (Yoon and Malecki 2010). Since innovation and global value capture through licensing are important to be successful in the industry, many animation studios in Seoul have focused on developing characters with fewer Korean cultural characteristics. Obtaining codified knowledge and creating linkages with outside clients were important for the initial growth of the animation industry in Seoul. However, at present, the role of local resources, including knowledge and funding, has become more important for the animation studios of Seoul.

### ***Mumbai: a new, global subcontractor with IT strengths***

Mumbai, a major center of the Indian movie industry, shows a high percentage of local (49.7%) and global linkages (42.2%), but national (8.1%) and Hollywood (7.5%) linkages are less frequent. Over 1000 movies are produced in India each year and the domestic market is large (UNESCO 2013, Crane 2014), but a global pipeline remains under-developed for Bollywood movies (Lorenzen and Mudambi 2013).

However, a strong IT industry in India provides skilled and English-speaking labor, and low-cost production, and this has created a boom in the city's animation industry (Tschang and Goldstein 2010). Thus, Mumbai has emerged as the center of offshore animation in India and their international clients include the USA (excluding Hollywood), and European and Asian countries. Although outsourced work from Hollywood and Japan has been increasing, original Indian animated films have received little attention from global audiences (Westcott 2010).

The characteristics of animation production in Mumbai are quite distinct compared to the other animation centers. First, the limited audience, mostly children, makes animation less popular in India compared to live-action films. The industry has also suffered from the lack of labor possessing high level of creativity in CGI software (Lent 2009). Second, platforms for exhibition and licensing of animated characters are not fully developed compared to Hollywood, thus making the local industry unable to exploit the full value chain of animation production. As a result, major studios in India generally produce more live-action films than animated films (Indo-Asian News Services 2013). Indian animation studios with their strong IT skills tend to be involved more with subcontracting projects involving visual effects for Hollywood movies (Govil 2008, Lent 2009, Julka 2013). Third, the brand images of Indian animated films are relatively unfamiliar to non-Indian audiences as the films comprise only 1% of the global market (The Hindu 2012). Animated

films are easily exportable to other countries, especially if they contain a high level of content that are easily transferable to global audiences and low levels of content based on 'local context' (Westcott 2010, p. 254). However, many Indian productions refer to the local culture, e.g. Indian mythology (Indo-Asian News Services 2013). Thus, non-transferable cultural content hampers export of Indian animated films to other countries.

The adoption of CGI has lowered the entry barrier and has made more Indian studios visible within the animation industry GVC (Julka 2013). For example, formation of joint ventures between local studios and regional studios of TMCs has been an important strategy within the Indian animation industry (Bhushan 2011). In addition, experienced animators 'returning' from Hollywood have contributed 'know-how' and creativity to the Indian industry. Thus, most animation studios in India are better in exploiting codified knowledge and have not developed high levels of tacit knowledge. Overall, the Indian animation industry has become a newly emerging global subcontractor and has enormous growth potential because of the huge domestic market.

## Conclusion

This study analyzed spatial patterns of production in the animation industry and different scales of linkages among production cities. Animation studios in all the countries, like other cultural institutions, are mostly located in large cities, and these cities located on different continents are interconnected at multi-scalar level. Overall, studios in each city developed regional linkages using a variety of strategies based on their strengths, specialties, and status under the globalized production system. These multi-scalar linkages are influenced not only by low production costs, skill level of local workers and available technology, but also by factors such as long-term relationships, affiliated institutions, government support, domestic markets, subcontracting experiences and professional reputation. The analysis of multi-scalar linkages of six different animation production cities revealed the following:

First, global producers like Hollywood demonstrate strong local connections but their global linkages are now more geographically dispersed. The highest value capture belongs to global producers that employ tacit knowledge. They have also paid attention to integrated markets which can produce bigger profits through merchandising and licensing products. Furthermore, major global producers have developed distinct styles and genres for their creative products through the use of branding.

Second, differences in local and non-local linkages in the chosen cities are a result of their unique accumulated history, specialized functions, and the type of local knowledge. For example, due to geographic and cultural proximity to production centers such as Hollywood in North America and London in Europe, Toronto, Montreal and Dublin are now successful regional production centers. The other two global subcontractors, Seoul and Mumbai, have great potential but mostly remain destinations for outsourced projects.

Third, non-local linkages including Hollywood, regional, and global linkages are found to be more important than local or national linkages in the successful functioning of regional production centers in the case of Toronto, Montreal and Dublin. For example, regional production centers like Toronto have struggled to build their own brand that is different from Hollywood. Instead, they have focused more on producing animated TV series, and have adopted a coproduction strategy

that identifies them as a second-tier, animation production centers supported by friendly government policies as well as geographical and cultural proximity to global producers.

Each city's position within the global animation production system is based on many factors, such as the local history of the industry, the capacity to learn and innovate, and the local and national market structures. Each of these cities has also experienced a shift in their position within the animation industry GVC. The animation industry has been globalizing for decades, and the region-specific characteristics of each production center tell the larger story of globalization of the animation industry. However, this article does not intend to make generalizations about different types of production cities or seek a single evolutionary path of development. Each animation city has adopted its development path based on its innovative capabilities and the given conditions within the GVC. In this sense, this paper highlights that both local and non-local linkages are important to understand the formation and development of remote locations. Furthermore, these should be carefully studied under a wide range of global and local factors.

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### Notes

1. The terms external linkages and non-local linkages have been used interchangeably in this article.
2. Cel or Celluloid refers to a transparent sheet that was used in animation production. Introduction of the cel animation technique changed the artisanal style animation production to a Fordist style of production system, and led to increased outsourcing of labor-intensive work to foreign countries.
3. Animated or movie series are created for and distributed through websites, such as YouTube and Vimeo. The length of each episode is less than 20 min and easy to watch on the web (Stelter 2008).
4. Animation World Network included only 49 Japanese animation studios.

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