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Places and spaces in the weightless economy

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Abstract:

Proposition of the 'end of geography' based on globalization and digitalization has been heavily criticized by different geographers in the last decades. This paper mainly focuses on the digitalization side of debate because of the more obvious and contradictory relationships between geography and digital production/consumption. Based on a systemic reflection on the literature in new media industry in general, and video game industry in particular, this paper bridges two different strings of research in the weightless economy. By referring to previous respondents' opinions as well as extracting new ideas from other empirical studies, this paper organizes its arguments in a comprehensive way and supports these arguments with abundant empirical evidence found in different case studies. It contributes to economic geographers' side of debate on the role of geography in today's weightless economy.

Keywords: the weightless economy; the end of geography; new media; video game industry

JEL Classifications: A14, D20

1 Introduction

In the past decades, the increasing influence of digitalization and globalization on people's lifestyles makes the debate concerning the role of geography in economy a popular topic among academia. Proponents who suggested the 'end of geography' (O'Brien, 1992) or the 'death of distance' (Cairncross, 1997) have based their arguments of the declining role of geographical spaces mainly on the broader context of the ever-increasing globalization and digitalization since 1980s. Scholars who attributed the diminishing role of geography to the globalization processes claimed that distance, which measures trade costs, matters less for trade over time with the onset of globalization owning to the easier transportation of goods and the faster communication of ideas(Cairencross, 1997; Lin and Sim, 2012; Yotov, 2012).Another group of researchers, who saw the great influence of digitalization on contemporary society claimed that the improvement of ICT makes significant reduction of costs in reproduction and distribution of e-goods possible. As a result, the role of physical location associated with the transportation of raw materials to the producer and the goods to the market are no longer relevant (Quah, 1999). In this sense, geography exerts less influence on the different processes of digital production, distribution and consumption.

These propositions are heavily criticized subsequently by two strands of research in geography: the 'death of distance' hypothesis based on globalization is critiqued by so-called 'regional geographical' approaches and the 'scalar' arguments for considering the global-local nexus from the mid 1990s to 2000s (Cox, 1997; Dicken, 2004; Yeung, 1998; Wei, 2006); the 'end of geography' prophecy based on digitalization, on the other hand, is challenged by economic geographers who proved the significance of geography in digital, and ICT-based sectors (e.g., Leamer and Storper, 2001; Morgan, 2004; Pratt, 2000, 2004, 2009, 2013; Johns, 2006; Neff, 2005; Høvig, 2016). These studies can be regarded as geographers' direct responses to those mainstream economists who challenge the base of the human

geography discipline.

While these two strands of criticisms are helpful for understanding the role of geography in economy, scholarship that focused on digitalization seems to be more interesting because of the more obvious and contradictory relationships between geographical distance and digital production/consumption. One the one hand, people have more explicit feelings on the declining role of geography because, for example, gamers in East Asia can easily buy video games produced by European and American companies online and download them directly to their PC, PSP, and Xbox. In this sense, geography really doesn't matter that much for digital consumptions. On the other hand, however, the production of the digital products nowadays still remains in certain places globally. ICT-based industries are not footloose anyway if thinking about the agglomeration of software companies in Silicon Valley, video game studios in Montreal, and new media firms in San Francisco. In this aspect, geography still matters for the digital production processes.

This paper also focuses on this digitalization side of debate, and tries to find out whether geography plays a significant part in the 'weightless economy' (Quah, 1999). Unlike previous scholarships replying against the 'end of geography' proposition from the digitalization side, which are either based on single cases or pure theoretical formulations, this paper organizes its arguments in a more systematic way with the support of a large body of empirical evidences. These evidences are found in research carried out by economic geographers who highlight the role of spaces and places in their case studies. The aim of this paper is, therefore, to argue against the 'end of geography' hypothesis by reflecting on the literature in the weightless economy, and to find rich empirical evidence for the vital role of geography in this weightless economy.

As weightless economy consists of many different sectors, it is impossible to include all of them in this study. Therefore, literature on new media in general and video games in particular is selected and

reviewed. New media is among the newest contributors to the increasing scale and variety of economic activities depending on digital technologies. New media initially incorporates what has been known as 'multimedia' (Pratt, 2000). With the development of digital and interactive technologies, it nowadays also covers those products and activities identified by concepts such as 'digital media' or 'interactive media' (Cornford and Naylor, 2001).

Video game is one of the most fast-growing sectors of new media industry (Izushi and Aoyama, 2006). Thanks to the improvement of game developing skills, and the popularity of online user communities, many parts of the value creation processes in video game industry can now be realized online. As an industry that sees most of the virtualization of activities (Johns, 2006; Tschang, 2007), it might be convincing to claim that geography matters, if places and spaces still play an important part in the video game industry.

We proceed as follows: Section 2 introduces the notion of weightless economy and previous scholars' responses to the proposition of the 'death of distance' in digital time; Section 3-5 illustrates the significance of geography in the new media and video game industries with the support of a large body of empirical evidence. Section 6 presents the discussion and conclusion.

2. The weightless economy as the 'end of geography' in this digital time?

With the fast growing of ICT, the economic value attached to elements such as creative ideas and tacit knowledge is becoming increasingly important. The notion of the 'weightless economy' points to the possibilities of the radical reduced costs in reproduction and distribution of e-goods such as software, new media electronic databases and libraries, and internet delivery of goods and services (Quah, 1999). Consequentially, the role of physical locations is no longer important for this weightless economy. It is on this foundation, that hypotheses such as the 'death of distance' and the 'end of geography' have been proposed in this digital time.

Economic geographers have continually responded against these hypothetical opinions since they were proposed (e.g., Leamer and Storper, 2001; Morgan, 2004; Neff, 2005; Pratt, 2000, 2004, 2009, 2013). Morgan (2004), for example, criticized this as an exaggerated death of geography. He pursued the argument that geography matters in digital economy in three ways: first, by questioning the 'distance-destroying' capacity of ICT; secondly, by arguing that physical proximity may be essential for some forms of knowledge exchange; and thirdly, by highlighting the growth of territorial innovation systems. Leamer and Storper (2001) argued that although the Internet creates forces for deagglomeration, it causes agglomeration as well because the bursts of innovations in the digital time require high levels of coordination and face-to-face contact. Although the ICT allows long distance 'conversations', it does not allow 'handshakes'. Based on the perspective of cultural production, Neff (2005) highlighted the importance of social networks in the digital media industry in the case of New York City. According to her, place becomes more important to digital cultural production in cities. Networking is concentrated in activities within narrow geographic clusters. Similarly, Pratt (2004, 2009) claimed that the analytical pendulum has swung too fast in prioritizing consumption and the immaterial in the digital economy such that it even erased off the role that space plays in the digital creative economy. Based on New Media (Pratt, 2000, 2013) and computer games (Pratt, 2013), he argued that the weightless economy is actually embedded in the 'world of atoms and people' (2000, p.427).

While persuasive at first glance, these studies are based on either single cases or pure theoretical elaboration. However, none of them have been supported by much empirical evidence. Parallel to this string of literature, another strand of research on the weightless sectors (e.g., new media and software industries), has become increasingly popular recently in economic geography. These empirical studies explored the geographical aspects of digital production, the local embeddedness of tacit knowledge, and the agglomeration economies of co-located ICT-based firms. While researchers from this line of research might support geographers' arguments on the role of geography in the weightless economy,

few of them have explicitly mentioned the importance of geography in their studies as if everybody should know about that, and even fewer have argued against the 'death of distance' hypothesis.

It is clear that there is a mismatch between these two lines of research. On the one hand, scholars who have explicitly responded against the proposition of the 'death of distance' were weak in providing abundant empirical evidences for their arguments; on the other hand, while plenty of empirical studies on the weightless economy should have provided fresh evidences for the importance of geography in the weightless economy, they, unfortunately, have seldom refuted the 'death of distance' hypothesis.

This paper bridges the two bodies of research by systematically reviewing the literature on new media and video game industries. One the one hand, it organizes its arguments on the role of geography in the weightless economy in a systematic way by reflecting on previous respondents' opinions as well as extracting new ideas from other case studies. On the other hand, it supports these arguments with a large body of empirical evidences found in the new media and video game industries. Overall, in the context of the weightless economy, geography is important in the following ways: first of all, the creation and the transfer of tacit knowledge within new media (and video game) firms requires specific local conditions; Secondly, the spatial concentration of digital creative clusters values the benefits generated by co-location; And thirdly, the material and real aspects of digital production make certain places or spaces still quite important for such production. In the next sections (Section 3-5), these three aspects will be elaborated on with the support of rich empirical evidences.

3. Tacit knowledge and the specific conditions of places

The high dependence on tacit knowledge is one of the most important characteristics of the weightless economy. In new media sector, tacit knowledge is created and transferred through socialization in the form of learning by doing and collective problem solving (Nonaka and von Krogh, 2009). The tacit nature of knowledge is usually stressed as the factor calling for proximity and direct face-to-face

interaction (Gertler, 2008). Therefore, the social context of a specific location, such as local conventions, routines, norms and values, is important for the new media industry since it provides the basis for the understanding of such tacit knowledge. As Gertler (2003, p.78) puts it, 'tacit knowledge both defines, and is defined by social context.'

As stated by Pratt (2000, 2009) and Neff (2005), locally-embedded social and cultural contexts provide fertility for new media products, and they are the main reason why geography is still important for the new media industry. Local conditions matter in two ways for the formation and diffusion of tacit knowledge in new media: first of all, proximity and networks specified to certain places facilitate the tacit knowledge transfer among new media firms, and are vital for the local buzz of un-codified knowledge (section 3.1); Secondly, social and cultural contexts are important for the dynamics of knowledge creation (section 3.2).

3.1 Proximity and networks and knowledge transfer

In economic geography, a crucial question is whether geographical proximity influences the likelihood of interactive learning and knowledge transfer (Boschma, 2005; Morgan, 2004). Boschma (2005) distinguished the effect of geographical proximity from other forms of proximity, such as cognitive, institutional, organizational and social proximities. Although the relationship of geographical proximity to other forms of proximity in knowledge transfer among media firms remains contentious, many scholars agree that new media firms are more likely to collaborate with other firms when they have similar knowledge bases, share norms and values, belong to the same business group, embedded in the same social context or located in the same geographical area (Balland, et al., 2013; Pratt, 2000). Proximity is important for new media firms in seeking to access fast changing information. In the new media industry, the quality of this kind information is fuzzy and un-codified. As a result, it usually requires face-to-face interaction. On the other hand, different forms of proximity are also very helpful

for networking among new media firms, which is one of the most important intermediations for local buzz and communication. Neff (2005) found that networking events— cocktail parties, seminars, ceremonies, and the like—facilitate access to crucial resources within the industry such as tacit knowledge as well as shared values and norms. Moreover, she also discovers that such networking is concentrated in activities within narrow geographic areas, what highlights the significance of proximity for knowledge transfer and local buzz. Pratt (2009) manifested that gossip, underpinned by trust and confidence, is a vital means of communication embodied and strongly embedded in places. Such gossip from the local café, or from neighboring firms and buildings can be vitally significant for new media industry.

In the context of the video game industry, the industry is inherently characterized by a constant demand for novelty (Johns, 2006). As a result, local buzz or tacit knowledge learnt through interacting with others firms becomes increasingly important. Balland et al. (2013), for example, analyzed the formation of network ties between video game firms on a global scale. According to them, as technological complexity of video game development is increasing, more inter-firm collaboration at short geographical distances is required. Video game firms tend to prefer partnering over short distances as the industry evolves. Moreover, as the technologies and knowledge used in video games became more complex, more cognitive proximate partners are required over time. Of course, virtual user communities, or online gamer sites also provide crucial consumers' knowledge and feedback to video game companies, but they can never replace the local buzz that firms gain by locating in certain places.

Considering the significance of proximities and networks for the knowledge creation and diffusion within new media and video game companies, it is expected that locations, where strong relationships between different actors have been established, are places that still show great attractiveness to new media and video game firms.

3.2 Social/cultural context and knowledge creation and diffusion

Besides proximity and network effects, locally-embedded social and cultural context also plays a very important role in the knowledge creation and diffusion processes of the new media sector. Those 'untraded interdependencies', such as place-specific conventions, rules, norms, and practices, both enable and result from the creation and diffusion of tacit knowledge (Bathelt and Cohendet, 2014).

The type of creative knowledge referred to in the new media industry is closely associated with innovation processes regarding new or improved products and services, new design, as well as their technological, institutional and market background (Amin and Cohendet, 2004). Such processes of knowledge creation and innovation are shaped by specific circumstances. As highlighted by Bathelt and Cohendet (2014), the interaction of new media firms with both formal and informal groups and communities is at the core of the dynamics of knowledge creation. Within such dynamic contexts, new media firms—be they early-stage startups, or experienced firms—find opportunities to tap into the cognitive constructs of relevant local communities. Martin and Moodysson (2011) explored the geographical and organizational patterns of knowledge flows in the media industry in southern Sweden. According to their research, symbolic industries draw heavily on creative production and a cultural awareness that is strongly embedded in the local context, thus knowledge flows are expected to be most of all locally configured, and firms rely on informal knowledge sources rather than scientific knowledge or principles. Their findings also showed that new media firms rely heavily on knowledge that is generated in project work through learning-by-doing and by interaction with other firms in localized networks.

As an important part of new media, knowledge creation and knowledge flows in the video game industry also highlight the specific local conditions in certain places. Aoyama and Izushi (2003), for instance, explored the technological, cultural and social foundations of the Japanese video game

industry. They found that creative resources and tacit knowledge nurtured by popular cartoons and animation sector, combined with technological knowledge accumulated in the consumer electronics industry, facilitated the emergence of the successful video game industry in Japan. However, other research by Izushi and Aoyama (2006) found that unlike Japan's video game sector, the video game industry in the United States and the United Kingdom found less knowledge and technological connections with their comic and animation industries. The video game industry in UK developed through a process of skills and knowledge formation in the youth culture of 'bedroom coders'. Whereas in US, the industry mainly drew skills and knowledge from its arcades and computer sectors. Here, social and cultural context not only plays an important role in the knowledge creation of the video game industry, but also exerts great influence on the cross-sectorial knowledge transfer. Focusing on firms' practice in a game developer community in Bergen, Norway, Høvig (2016) found out that a firm's practice is either embedded within or related to local networks and institutional structures. He proposed that instead of portraying the game industry as a 'footloose industry', the dynamic relationship between actors, context and practice should be heeded.

Overall, local-embedded social cultural conditions are still quite significant for the creation and the diffusion of knowledge among new media firms in the same industry or in other relevant industries.

4. Agglomeration economies and the locational decision of firms

Similar to the argument that the tacit nature of knowledge requires special geographical conditions, the benefits generated by agglomeration economies of new media firms provide another evidence why real places are important for the weightless economy. Agglomeration economies here can be categorized as localization economies (benefits generated by co-located firms within the same industry) (section 4.1) and urbanization economies (benefits generated by diversities of industries in cities) (section 4.2).

4.1 Localization economies and new media clusters

In recent years, the emergence and development of new media clusters in specific locations such as 'Silicon Alley' in New York City (Neff, 2005; Pratt, 2000), and 'Multimedia Gulch' in San Francisco (Pratt, 2009) manifest that localization economies still play a very crucial role in the locational decision of new media firms. Halbert (2012), for instance, provided an intrinsically dynamic overview of how creative digital clusters work and how they are linked to collective action and reflexive co-ordination. The emergence and proliferation of collective actions correspond to an organizational shift in which a cluster evolves from low-level collective actions, to high-intensity interactions involving wide-ranging activities innovation enhancement, labor training, etc. Recently, many studies have explored the clustering of the video game industry, as well as the localization economies that are generated by such co-locations. Focusing on the global video game industry, De Vaan et al. (2013) manifested that co-located firms were able to establish a local pool of creative and skilled labor, reduced the costs of inter-firm transactions and generated knowledge spillovers. Dense interdependencies between co-located firms are argued to provide these firms with the opportunity to learn from new insights, to respond to changes in the environment and to generate novel products as a result of the exposure to diverse practices. Pilon and Tremblay's (2013) work on the video game clusters in Montreal and Los Angeles showed that concentration of human creativity in arts and in technology is a significant economic localization factor, but cross-fertilization of sectors and public policy also contributed to the understanding of the emergence of video game clusters in certain urban regions. Cornford and Naylor (2001) analyzed the video game clusters in UK. The geographical concentration of the video game industry has been driven essentially by rationalization, reduced overheads and the search for synergies and economies of scale. Their interview findings suggested that there are distinct benefits for game publishers to cluster, specifically to cluster in London. In addition to close proximity to the financial community, the key advantages of a location in the capital relate to securing the optimum channel to the market. Darchen (2015) carried out an interesting research on the spatial agglomeration of video

game firms in two cities of Australia—Brisbane and Melbourne. His research found that the primary reason that video game firms co-locate is to share tacit knowledge and skilled labor. Tschang's (2003) work on America's video game clusters suggested that local entrepreneurship is an important factor for clustering.

Overall, localization economies which highlight the benefits of co-location of firms within the same industry turn out to be still quite influential for new media and video game firms in deciding where to locate their activities.

4.2 Urbanization economies and digital clusters in cities

Besides the industrial-specific localization economies, another kind of agglomeration economies—urbanization economies, which highlight the benefits of various firms co-locating in cities, helps much in explaining the digital clustering phenomenon in big cities. Cities tend to be the centers of what Landry (2000) termed the "hard infrastructure" of creative clusters, where the head offices of the major industry players are located (especially in media-related sectors) and where governments have typically invested heavily in the cultural infrastructure of cities. This in turn act as a catalyst for the formation of "soft infrastructure", such as trust, reciprocity, exchange of tacit knowledge and propensity to share and pool economic risk (Amin, 2000).

Taking new media industry as a case study, Pratt (2013, p.4) highlighted the urban creative labor pool in project-based enterprises: 'The diverse skill set found in cities is critical to emergent new media companies; in part on technical coding skills, in part of marketing and strategic management expertise, and in part on artistic skills of narrative and visual rendering.'

Focusing on the video game industry in Montreal, Grandadam et al. (2013) explored the dynamics of situated creativity by reconsidering the formation of externalities in cities. Such externalities, in the form of new ideas, concepts or skills, are generated through the interactions of various actors of

creativity. They argued that focusing on the two concentrations through which knowledge externalities in cities are conceived (i.e., the concentration of firms, R&D centers, or laboratories, which are organized institutions from the 'upperground', and the concentration of skilled individuals in the 'underground') limits the possibility to examine some more fundamental questions related to the dynamics of creativity in cities. Alternatively, they propose the 'middleground' dimension of creativity—the articulation between places, to explain the dynamics of the formation of externalities in cities. These communities of the middleground play a major role in fostering the dynamics of creativity in Montreal's video game cluster.

Although the ICT base of the digital economy as well as the globalization of the world economy give new media and video game firms more freedom in choosing the location for their activities, benefits of agglomeration economies including those related to the co-location of firms in the same industry as well as in different industries continue to influence firms' locational decisions.

5. The material/real aspects of digital production in specific places

With the development of ICT as well as the popularity of online communication, many parts of the new media and the video games production are gradually changing to an online environment. As the production of new media and video games becomes more complex, the hybridization of both the virtual and the material, and the technological and the social-cultural turns out to be inevitable (Pratt, 2013). Customers' knowledge and ideas, as well as the virtual ways of communication become increasingly important elements for digital production. Concepts such as 'user-lead innovation' (Aoyama and Izushi, 2008), 'online user community' (Hau and Kim, 2011), 'virtual communities' or 'open source communities' (Burger-Helmchen and Cohendet, 2011) have become hot topics in new media and video game studies. Theoretically, all actors in the production processes of such digital goods, including producers and consumers, are free from limits of location (Johns, 2006). However, this does not

necessarily mean that the virtual substitutes the material. Actually, instead of moving online totally, many new media and the video game companies have distinct studios, and they also evolve into clusters as a consequential choice (e.g. the video game cluster in Montreal, Pilon and Tremblay, 2013). From this point of view, the new media and the video game studios are a strong countermovement to the concept of virtualizing the workforce. Pratt's (2000) argument is quite helpful for understanding how to embed the weightless production in the world of atoms and people. According to his ideas, even within 'new media', few goods actually fall into the pure weightless category, which must be conceived, traded and distributed totally online. Moreover, weightless products still have to be conceived and created. Such production, however, is an intensively human process in which huge teams of designers and managers continue to create and update the software. Finally, although theoretically the coordination of different actors in the production of virtual goods is possible to be carried out remotely, the 'power of place' still continues to exert influence because face-to-face interaction still dominates the coordination of such production. In addition to Pratt's propositions, the uncertain demand for both new media products and video games also makes certain places quite important for digital production because these places usually have famous brands, good reputation, etc.

In economic geography, a large body of research has, more or less, touched upon the issue of the geography of digital production. Notions such as global production networks, value chains, project-based production and the socio-cultural elements of production, contribute to the understanding of the significance of the physical aspects of such digital production.

5.1 Global production networks and value chain perspective

As put forward by Johns (2006, p. 153), 'in today's increasing interconnected global economy, conceptualizing the organization of economic activity involves the consideration of many actors

operating in ever more complex environments.' The 'global production network' (GPN) approach has been adopted to the studies of the organizational structures of the new media and video games production recently. Johns (2006), for example, conceptualized the GPNs of the video game industry through an examination of its evolution into a multi-million-dollar industry. She argued that geography plays a vital role in the GPN of video games, particularly in the production of game software, which is actually bounded within three major economic regions: Western Europe, North America and Asian Pacific. Based on specific locations, some studies explore how digital firms in different parts of the world participate in the GPNs. Parker et al. (2014) focused on Australian development firms in the console and mobile games industry in order to understand how small firms in a geographically remote and marginal position are able to relate to global firms and capture revenue share. This case shows that, while industry architectures and governance arrangements in the growing sector for mobile games differ from those in the console value chain, the new arrangements such as the technological changes and the development of mobile Internet device, have created a different basis for unequal bargaining power of small remote developers. Moreover, O'Riain's (2004) research found out that strategic participation in GPNs and innovation is crucial to develop strong regional systems. The analysis suggests that political strategies are central to the ability of firms and territories to integrate into particular niches in GPNs.

In addition to the GPN approach, some research explored the value chain or the value creation processes in weightless industries. For example, Marchand and Henning-Thurau (2013) developed a conceptual framework for value creation through video games. In this framework, they distinguished a vertical path that represents the 'gaming environment'—the main actors within the industry, and the 'horizontal path'—the channels of distribution (physical and digital channels) and communication (traditional and social media) that link content providers to customers. Similarly, Gidhagen et al. (2011) exemplified how value creation is orchestrated by developing firms within the video game industry,

and illustrate value creation as a continuous process. While some parts of the value creation can be moved online (e.g., digital channels of distribution, online consumption, and online user communities), according to these studies, most parts remain in the real world.

Although notions such as GPNs, value creation process and value chain in the weightless economy do not directly point to the significance of geography, people can hardly imagine these processes without referring to the real and material sides of the new media and video game production. Again, the physical aspects of digital production can never be overlooked because most of the processes of the production still remain in specific places globally.

5.2 Project-based production

Digital industries such as new media and video game industries are usually based on project-based production systems involving creative and business-oriented entrepreneurs. The firms involved are continuously updating each other, exchanging ideas and negotiating decisions. The products that come out of these projects are unique: each product distinguishes itself by introducing more or less novel stylistic elements (Balland et al., 2013).

Similar to tacit knowledge transfer, such project-based work is also affected by local factors such as institutions, shared norms and values, etc. Christopherson (2002) studied the institutional aspects of project work in the new media sector in the US. Project work in new media has been affected by changes in the regulatory regime governing entertainment and information-intensive industries in the US. For the new media worker, stronger dependence on interpersonal connections for credentials, legitimacy, and job means stronger dependence on regional markets. As a result, place-based networks are critical to a large segment of the workforce in project-oriented industries. Similarly, Watson (2012) argued for the incorporation of sociological perspectives (i.e., the involvement of sociological, political

and cultural issues) into the analyses of project-based working in the creative industries (particularly in the digital creative industries). He suggested that such an approach can contribute to the economic geography of projects in three ways: first, it allows for an understanding of the importance of agency in project work; secondly, it allows researchers to move on from firm-level analyses to develop an understanding of the complex social networks involved in project-based working; and finally, it provides micro-level analyses for project work.

In the video game industry, many studies have highlighted the project-based nature of video game production. As pointed out by Johns (2006) and Tschang (2007), the production of a video game is carried out as a project involving development and publishing companies, in which artistic, commercial and financial expertise are being recombined. At the start of the industry in the 1970s, project teams consisted of only a few individuals who were involved in the process of conception, creation, marketing and distribution of a video game. But this number rapidly increased to more than 100 people nowadays, reflecting the rising technological complexity of modern video game production (Balland et al., 2013). Based on the global video game industry, De Vaan et al. (2013, p.986) claimed that 'project-based collaboration maximizes 'recombinatory options' between a diverse range of skilled experts and that the potential for recombining expertise in project configurations rises non-linearly with the size of the cluster.'

Although not being part of the argument in this section, it is worthwhile to notice that, despite the dominance of corporate game development, independent developers of digital games become increasingly popular recently (Williams, 2002). According to Martin and Deuze (2009, p.278) 'Platforms such as mobile phones, browser-based internet sites, digital distribution networks on consoles, and the market for handheld games all provide new opportunities for low-risk entry into game development.' Particularly, Google and Apple stores are the main avenues through which independent developers can easily get access to the market, such that individuals (e.g., hobbyists, artists, and fans)

tend to develop games themselves, and sell their products on these platforms. In this context, project work might not turn out to be a necessity. However, as pointed out by Williams (2002), these independent developers only fulfil a void that has not been adequately addressed by the mainstream developing companies. The main way of producing video games, accordingly, still remains in project work.

Like with the GPN approach, studies on the project-based work neither mention the real aspects of digital production nor the specific places explicitly. However, they all stress the fact that the project-based nature of the digital industries makes them heavily relying on localized networks (personal social and organizational networks) of a broad range of actors involved in the production of digital and creative goods.

5.3 Social-cultural elements as infrastructure and contents for creative production

In addition to the GPN approach and the project-based nature of the weightless industries, local-embedded socio-cultural environment also plays a vital role in digital production. Socio-cultural condition is important for new media and video games production in two ways: 1) it provides circumstance in which new media and video game production takes place (infrastructure); and 2) it is a crucial input for digital production (content).

Focusing on the new media production in Silicon Valley in general and on Google in particular, Turner (2009) termed the *Burning Man* community which provides the socio-cultural environment for creativity as the 'cultural infrastructure' for new media production. The article shows how elements of the *Burning Man* world—including the building of a socio-technical commons, participation in project-based artistic labor and the fusion of social and professional interaction—help to shape and legitimize the collaborative manufacturing processes driving the growth of Google and other firms. It concludes that *Burning Man* serves as a key cultural infrastructure for the Bay Area's new media industry. Here,

the socio-cultural environment provides the necessary circumstance, or the 'cultural infrastructure' for the production of creative new media products. In a broader way, Tschang (2003) provided a cultural-based framework for examining the nature of production in the computer game industry in the US. According to his research, although game development studios can locate virtually anywhere, the facts that certain cultural phenomena still dominate the global cultural scene, and that the creative class prefers to work in certain places, may limit the development of particular games to particular nations. Social and cultural circumstances specified to certain locations make them unique spots where creative digital products are produced. Similarly, Jin and Chee (2008) showed that online games in Korea are socio-cultural products that have been historically constituted by certain forms of knowledge and social practice: first of all, they map out the forces driving their development by examining government policies: secondly, they explore capital flow to investigate the major players in the market: finally, they explore the socio-cultural elements contributing to the diffusion of online games in the cultural milieu of Korea. In this context, the whole process of video game production is deeply embedded in the social and cultural circumstance of the country, which contributes to the rapid emergence of Korean online games in the global market.

In addition to the role of providing an infrastructure for creative production, social and cultural elements are also important inputs for such production. Particularly for the video game industry, which relies greatly on the social and cultural specificities of certain places, the cultural elements provide storylines for video games production. As has been pointed out by Salen and Zimmerman (2004, p.518), 'games reflect the values of the society and culture in which they are played because they are part of the fabric of that society itself.' Cao and Downing (2008), for example, examined Chinese gamers' preference on Western and Eastern games. According to them, Chinese gamers prefer to play games made by Taiwanese and Korean companies rather than Western games (with the exception of *World of Warcraft*). While the context of Taiwan and Korea-made video games are proximate to Chinese culture

(because both places are deeply influenced by Chinese traditional culture), it is really hard for Chinese gamers to identify themselves with the characters and the overall Western story theme created in Western games, which is so foreign to them. Cultural elements embodied in video game content are thus emphasized. Another study by Tsang and Tschang (2012) also highlighted the role of culture in Chinese game content creation. Some interviewees in their study valued the historical and mythological nature of the Chinese game content, for it is not only attractive for domestic players, but also remains a powerful factor when Chinese products move overseas (for example, to markets such as Vietnam).

Viewing from the material aspects of new media and video game production, it is clear that characteristics attached to specific places, such as the socio-cultural environment, and localized networks, are still quite momentous for the digital production processes. While some aspects of this kind of production have been virtualized, most parts remain in the real world.

6 Discussion and conclusion

With the development of ICT as well as the ever-increasing globalization, the idea that geography matters less for contemporary economy has become popular. While regional geographers have criticized the globalization base of the 'death of distance' proposition, and other economic geographers have questioned the digitalization foundation of that proposition, the later seems to be more interesting because of the more contradictory experience people have when it comes to the paradoxical relationships between geography and digital production and consumption. This paper mainly focuses on this digitalization side of debate.

Through reading literature on new media in general and video game industry in particular, we find that while some economic geographers have explicitly responded to the propositions of the 'death of distance' and 'the end of geography', they seemed to be weak in providing abundant empirical evidences for their arguments. Meanwhile, although there are a large number of empirical studies on

the weightless sectors in economic geography, they seldom argued against the 'end of geography' hypothesis. This paper combines these two strands of research. With the support of rich evidences found in empirical studies, this paper argues that geography still matters in the weightless economy at least in three ways:

First of all, the creation and the transfer of tacit knowledge within new media (video games) firms require proximities as well as social and organizational networking between different actors. Considering the significance of proximities and networks for the knowledge creation and diffusion within new media and video game companies, it is rational to expect that locations where strong relationships between different actors have been established are places that still show great attractiveness to new media and video game firms. On the other hand, social and cultural conditions specified to certain places are also emphasized since they contribute greatly to the creation and diffusion of tacit knowledge among new media firms in the same industry or in other relevant industries.

Secondly, while the development of ICT gives new media and video game companies freedom to locate anywhere they wish, the spatial concentration of digital creative clusters value the role that agglomeration economies play in the weightless economy. Besides traditionally highlighted benefits such as the reduction of costs, skilled labor pool and knowledge spillovers, recent work emphasizes other agglomeration economies such as channels to clients, social networks, local entrepreneurship, and untraded interdependencies. These benefits, which are highly relevant to specific places or spaces, can hardly be replaced or substituted by the virtual aspects of the weightless economy.

Thirdly, the material and real aspects of digital production and products makes geography or the physical world still an important part of the weightless economy. While studies based on global production networks and value chain or value creation approaches might not directly point to the

significance of the physical world, it is almost impossible to understand these notions without referring to the specific places where the production of new media products or video games takes place. Moreover, the social-cultural elements of specific locations provide not only the infrastructure but also the contents for such digital production.

While these three aspects might overlap with each other in certain ways, they are helpful for structuring the understanding of geography's role in the weightless economy. Besides these aspects, there are of course other situations where geography plays a vital part. For example, in the video game industry, in addition to the online distribution and marketing channels (e.g., online ads, fan sites, game modding communities), there are still traditional channels (e.g., consumer magazines, daily newspapers, game leaflets, etc.); and parallel to the virtual consumption mode, consumers can also buy consoles and play games at home. In these aspects, geography still matters for what kind of games are played by what kind of gamers.

Instead of announcing the 'end of geography', this paper argues that spaces and places are actually playing an increasingly important role in the weightless economy, particularly in aspects such as the production of weightless goods, the knowledge creation and diffusion among digital firms, and location decision of digital companies.

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