# Triggering the emergence of digital ecosystems: the role of mobile and video games in emerging economies

Jean Paul Simon

Jean Paul Simon is Director at JPS Public Policy Consulting.

## Abstract

**Purpose** – This paper aims to shed some light on the role of video games within the media industry and IT sector, on its contribution to the production and distribution of digital content in emerging economies. It offers a case study on the role of mobile devices as a factor of transformation and shows how under changing socio–economic conditions, the transformations enabled the creation of digital ecosystems and innovative business models.

**Design/methodology/approach** – The paper is based on desk research, a review of literature and trade press and comments from experts and industry players.

**Findings** – The paper argues that as the internet is going mobile, driven by data – mostly video – the new mobile platforms are becoming the key for the distribution of content and mobile games. Whether it is the history of browser games in China, mobile games in India or PC games in Russia, each national gaming industry has required a unique strategy for making money, building on some prominent cultural factors and adapting to the local economic conditions. The paper reveals that video games are now clearly a vital part of digital content production in these countries, while stressing upon the role of public policies.

**Research limitations/implications** – The paper relies mostly on industry and consultancy data, as in such a fast-changing environment official data even when accessible are in most cases too old to remain relevant to identify the trends and the fast changing stakes. This calls for some caution about the data. Therefore, the data used should be treated as just signals of potential trends, sufficient to provide an appropriate overview of the evolution of the global mobile ecosystem.

**Practical implications** – This paper shows that the video games industry can serve as a pivot for the ICT industry. Besides, this prompts upstream and downstream industries of the entire digital entertainment market to thrive.

**Social implications** – The paper shows that companies from emerging markets companies have been betting on a combination of factors: the development of the economies, the growth of the mobile market, emerging middle-classes and young customers. It provides a growth model that appears to be close to a "regular" industrial growth model.

**Originality/value** – Although there is a growing academic literature on the video games industry, few research have been devoted to specific issues of emerging economies and to the role of video games within the media industry and IT sector.

**Keywords**  China, India, Mass media, Developing countries, Public policy, Mobile communications systems

**Paper type** Research paper

Over the last 40 years, the video games industry has grown steadily, increasing its audiences worldwide, widening its demographics and adding access platforms along the way (video consoles, portable consoles, portals, mobile handsets, etc.). Indeed, the video games market has been growing, not only in value but also in its audiences. Now, gaming itself is beginning to be seen as a mainstream source of entertainment for families. According to Newzoo (2018), the worldwide games market will reach $113.3bn by 2018.

www.manaraa.com

This sector has become as important for the production of content (especially digital) as the movie industry.

Since 2004, the online and wireless video games market has grown with remarkable rapidity, driven by the increase in the number of broadband subscribers, the innovation in available games, the transition to handheld devices and the newest generation consoles. Now smartphones are a popular gaming platform. Smartphones provide the engine for growth. Since 2013, particularly large increases have occurred in several populous countries, including China, India and Russia (Pew Internet, 2016).

Smartphones and the mobile internet saw the advent of applications for the consumer. App stores have changed the value chain of software (distribution and pricing). Games are the number one app by downloads or revenues (iOS and Google Play). In 2016, games generated 75 and 90 per cent of all app store revenue through the iOS App Store and Google Play, respectively (AppAnnie, 2017a, p. 10). Games are expected to continue generating the bulk of app revenue according to AppAnnie (2017b).

Mobile gaming is indeed gaining strong traction in China, India and Russia. China and India are also the fastest growing mobile (data) markets in the world. As a result, Asia has been witnessing considerable changes in its games market and has introduced some business model innovation for example "freemium" games, now the dominant model in the world.

Although there is a growing academic literature on the video games industry (Benghozi and Chantepie, 2017; De Prato *et al*, 2014a, 2014b; Juul, 2012; Kerr, 2006, 2017; Zackariasson and Wilson, 2012; Wi, 2009), little research[1] has been devoted to specific issues of emerging economies, neither to the role of video games within the media industry and IT sector, nor to its contributions to the production and distribution of digital content. These would include the role of video games within the media industry and IT sector, to its and the industry's contribution to the production and its distribution of digital content. This paper attempts to shed some light on these issues by defining the backdrop for their development, stressing their shared features and highlighting their differences, which are mostly owing to cultural factors. It offers a case study on the role of mobile devices as a factor of transformation. It shows how, under changing socio–economic conditions, the transformations enabled the creation of digital ecosystems and innovative business models.

The first section of the paper accounts for the changes in the IT landscape and the role of the third mobile wave (internet mobile). It stresses the main common features of the growth of these markets in the three countries (i.e. dramatic growth of the mobile market, fast growing economies, emerging middle-classes and young customers). The next three sections offer a case study of each country. These sections open with an introduction to the state of the ICT industries and then move to a presentation of the video games markets (market structure, players, type of games). The paper concludes with the specific combination of parameters that characterizes each market and account for its growth. It will particularly focus on the role of local content (localization and vernacular) and that of public policies. It ends with a quick review of cases from three other countries: Brazil, Iran and Turkey.

This paper is based on desk research, a review of literature and trade press and on comments from experts and industry players. However, the paper relies mostly on industry and consultancy data given that in such a fast-changing environment, official data, even when accessible, is, in most cases, too old to remain relevant for identifying trends and fast-changing stakes. This calls for some caution about the data. The data used here should be treated simply as signals of potential trends. Nevertheless, it is deemed sufficient to give an appropriate overview of the evolution of the global mobile ecosystem.

## 1. Changing markets and the role of mobile in emerging markets

The information and communication technology (ICT) sector[2] has been a major contributor to the growth of these economies, specifically to the development of their GDP. For instance, ICT industries are at the core of innovation and the transformation of economic systems. ICT industries lead the globalization of value chains, enabling these countries to play a growing role. For instance, the participation in global trade networks and global value chains has been pivotal to China's economic success.

### 1.1 Mobile as game changer

For GSMA, the mobile trade association that tracks the evolutions of the global mobile ecosystem: "The internet is mobile, and mobile is the internet" (GSMA, 2016a, p. 28). GSMA states that as of 2018, there were approximately 8.5 billion mobile connections, i.e. as many mobile–cellular subscriptions as people in the world. On a unique subscriber basis, it goes down to 5.1 billion[3] (65 per cent of the population; GSMA, 2018). During 2013, access to the internet via mobile phones overtook fixed broadband access: 36 per cent penetration of population against 35 per cent of households with home broadband. Mobile internet penetration reached 55 per cent by the end of 2017 (Kemp, 2017a, p. 82).

As of 2016, GSMA (2016a, p. 7, 18) was forecasting that growth in the mobile internet will come from emerging markets, especially from Asia Pacific. Asian markets have been, indeed, the main driver behind global growth. GSMA deems that smartphones are likely to be the only access point to internet for many in emerging markets, the gateway to digital content. The continuing extension of the number of smartphone owners creates a large readymade base of potential new internet users, a growth driven by the continued decrease in device costs and rising incomes. New users, getting their first access, will require an array of services including some of the services that users from developed countries were previously getting from other sources (e.g. banking).

Besides this shift in the center of gravity of telecommunications, data traffic is dominated by video traffic. IP video traffic is set to account for 82 per cent of all IP traffic by 2020, up from 70 per cent in 2015 (GSMA, 2017a, p. 33). Video traffic will include internet video to TV traffic (growing 3.6 times by 2020) and consumer VoD traffic (growing twofold by 2020), with the increasing uptake of HD (and ultra-HD) screens strongly affecting traffic volumes. GSMA (2017a, p. 32) calls this phenomenon "the video-ification of everything in the digital world", stressing the important and disruptive consequences for a lot of industries among them the media and content industries.

For the mobile trade association, video "is increasingly becoming the default format for communication, collaboration, education, marketing and entertainment". This video stream is increasingly user-generated as the near ubiquity of smartphones with advanced cameras has empowered users to become content producers (Simon, 2016d), fueling the growth of live streaming and video sharing. Consumers are accessing on their mobile devices UGC, as well as curated collections of video clips from other sources, and edited content from legacy *players* (broadcasters and game publishers) and new players (streaming content providers). As of 2017, over 70 per cent of smartphone users[4] globally watch free online videos on their phone, and half of smartphone users watch or replay (free) live TV programs on their phones (GSMA, 2017b, Global Mobile Engagement Index). If television is listed as the top means for watching content inside the home, in developed countries (55 per cent), in developing markets, smartphones ranked as the number one device in the home for video viewing for 35 per cent of respondents (Cartesian-GSMA, 2017). The Reuters Institute Annual Report highlights a similar role for access to information, outside or inside the home (Reuters Institute, 2017).

As a consequence of this increased time spent on apps consuming video content, the growth of the value added within the broader mobile ecosystem (from infrastructure vendors to internet companies: over US$1 trillion in 2016; see Figure 1) is triggered now by

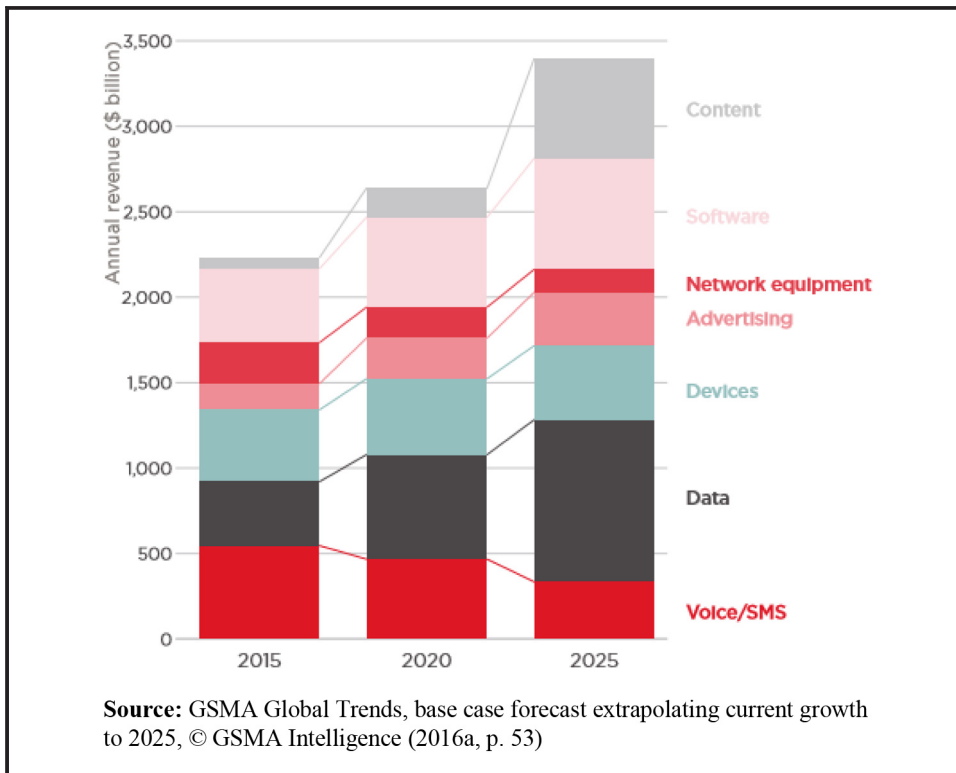**Source:** GSMA Global Trends © GSMA Intelligence (2016a, p. 52)
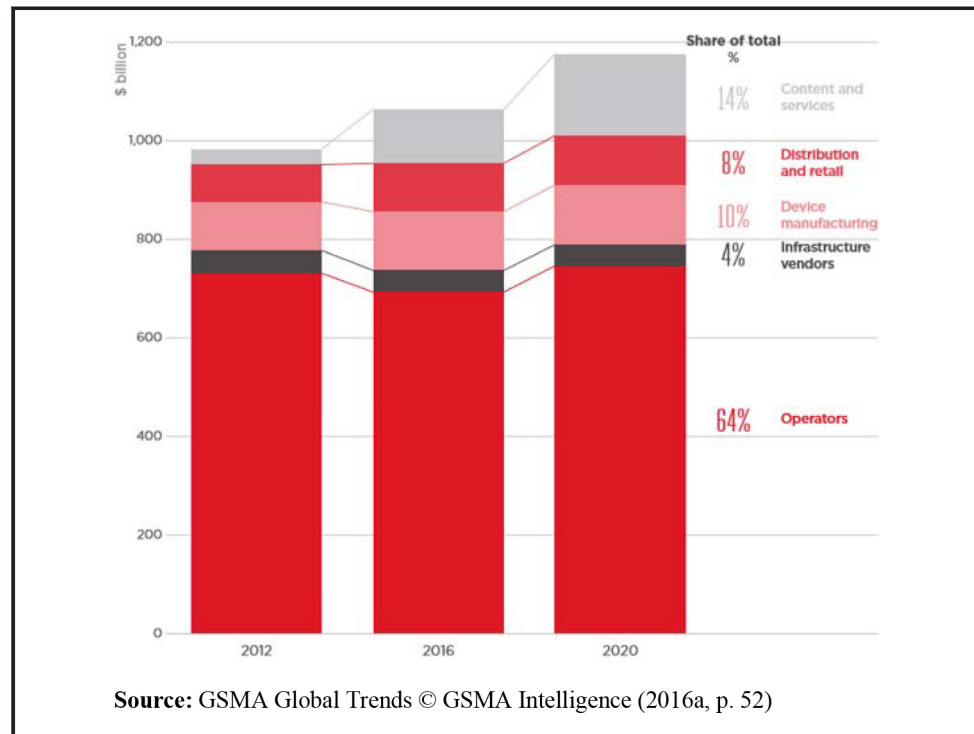
the content and services layer (increasing from 10 per cent in 2016 to 14 per cent in 2020). Mobile operators account nevertheless for roughly two thirds of value added.

GSMA (2016a) predicts a similar shift in terms of revenue between services. On the one hand, communications revenues (voice, SMS and mobile data) are slightly falling from 41 per cent of the overall ecosystem in 2015 to 38 per cent by 2025, while, on the other hand, new content players such as OTTs content (e.g. Netflix and Spotify), will increase from 3 to 17 per cent over the 10-year period, as illustrated in Figure 2. Figure 2 also reveals that revenues are projected to grow by almost US$1 trillion, between 2015 and 2025; in other words 17 per cent of this figure will be available for content providers. So content will provide a new engine for future growth.

The IP messaging app user base is growing exponentially. The big four messaging apps (WhatsApp, WeChat, Facebook Messenger and Viber) have a global user base that is approaching 3 billion. WhatsApp was first to hit 1 billion users. Most successful apps (mainly messaging or social-based) are building ever-wider ecosystems (app "constellations"), integrating a broad range of services as illustrated by the amazing success of Tencent's second platform, WeChat. Viewership and revenues are shifting rapidly to these new online platforms.

The average consumer typically uses a large number of apps (over 30 per month). As of 2017, there were over 3 million active apps available for download. The most popular categories are games (764,805 active), business (302,636 active), education (259,203 active), lifestyle (255,971 active) and entertainment (187,281 active; App Store Stats Summary, 2017). On the basis of revenues, China and the USA are by far the two biggest app markets in the world (Newzoo, 2016a). According to AppAnnie (2017a), in terms of revenues[5], Asian–Pacific publishers dominated the Top 50 in 2016 with 30 of the top

**Figure 2** Projected revenue distributions across the mobile ecosystem (2015-2025)



**Source:** GSMA Global Trends, base case forecast extrapolating current growth to 2025, © GSMA Intelligence (2016a, p. 53)

publishers hailing from that region. The same consultancy stresses that "APAC will remain the largest region by both downloads and revenue through 2021, with China leading the charge" (AppAnnie, 2017b, p. 4).

Within the apps, games were by far the revenue leaders. In 2016, games generated 75 and 90 per cent of all app store revenues, respectively, on the iOS App Store and Google Play (AppAnnie, 2017a, p. 10). Eleven Asian countries generate 55 per cent of global mobile game revenues, which accounts for US$20.4bn (Newzoo, 2016a). Video streaming apps are highly popular in Asia. Their business models are mostly based on "fans" purchasing virtual gifts, and they open up revenue-sharing opportunities as well (Lee, 2017, Simon, 2017b).

Active users of apps and games are playing a major role in the shift to a digital economy. As stressed by Newzoo (2017a, p. 4)[6], gamers[7] and millennials[8] are the two groups at the forefront of the changes taking place in the world of digital commerce and payment preferences. They are more comfortable with the new means of payment and, therefore, more likely to use mobile apps and eWallets to pay for purchases. The same report also stresses that consumers in the Asia–Pacific region are leading the way in the world of digital and mobile payment methods, with their adoption of new technologies (Newzoo, 2017a, p. 24). This is especially the case in China where online wallets are the preferred payment at 52 per cent, followed by credit/debit card at 36 per cent and mobile app at 32 per cent (Newzoo, 2017a, p. 19).

### 1.2 Changing conditions in emerging markets

Companies from emerging markets are betting on a combination of factors: the development of the economies, the growth of the mobile market, emerging middle-classes and young customers. This is a growth model that appears to be close to a "regular"

industrial growth model. Such a growth model seems to be fruitful as these companies; especially the Chinese ones are highly profitable.

There is no need to stress the dramatic growth of China and India. As emphasized in the Global Innovation Index (World Intellectual Property Organization [WIPO], 2016), the re-emergence of China, India as large markets and manufacturing powers has been one of the most significant events of the beginning of the twenty-first century. India is the fastest growing major economy in the world. The IMF predicts that India's GDP will continue to expand at the fastest pace among major economies, with growth forecast at 7.6 per cent in 2016-17 (7.7 per cent in 2018, IMF, 2017). After some ups (an average 7 per cent growth during 1998-2008) and downs (recession in 2015), Russia's economy shows signs of stabilization, but incomes have been nevertheless raising over a long period.

In China, India and Russia, growing middle class, rising disposable incomes, high volume of content consumption hold significant potential for digital content adoption. As an example, India's middle class population, as of 2015, reached about 20 per cent of the country's population. The National Council for Applied Economic Research (NCAER) estimates that by 2025-26, India's middle class population[9] is likely to double to 547 million individuals, about 41 per cent of the total (quoted by Sujatha, 2015). It is worth noting that the same source stresses a correlation between the rise of the middle class, as a phenomenon starting in the late 1980s, and the "IT revolution" in the country. One of the outputs is an increase of disposable income leading to a much higher share of expenses for recreational and educational activities: the share is expected to grow from 5 per cent in 2005 to 9 per cent in 2025 (KPMG-FICCI, 2016). Urbanization is also fueling consumption of digital goods; people using transportation have more available time, for instance, to play on the go.

The Pew (2016) report stressed that "age, education and income play a role not just in overall internet access, but also in the amount of time spent online". The same report described the Asian consumer as "younger, getting richer and using mobile for internet". These younger customers are more likely to be mobile-first or mobile-only internet users. The median age in Asian countries is low, particularly in India (27 years).

Younger internet users, millennials (those ages 18 to 34) tend to access the internet at least daily and participate in social networking at higher rates than their older counterparts (those ages 35 and older) (Pew, 2016, p. 6). They have developed unique behaviors using social media, especially in Asia. These customers are reactive to innovations on their mobile and which involves games. For instance, in India, more than 70 per cent of the Indian casual gamers are under 34 years old, half of them being in the 18- to 24-year-old bracket (Sompinmäki, 2015). India is indeed a younger nation, with a median age of 27.6 years in 2017, than China with a median age of 37.1 years and 39.3 years in Russia (CIA, *World Factbook*, 2017).

The business environment is evolving as well in these countries. One strong indicator of this evolution is the growing role of venture capital (VC)[10] investment. VC investments in Asia have also become substantial. VC companies are increasingly backing Asian start-ups, and now rushing to China and India specifically. Indeed, in 2014, VC investors seemed particularly interested in these two emerging markets, both of which saw almost a threefold increase of in funding levels compared to 2013 (EY, 2015). Games seem to be particularly attractive for VC investors: "Asia accounted for over half the games IPOs in 2014, and has dominated games IPOs for the last 5 years" (Tim Merel, managing capital of Digi-Capital, a research and consulting firm, quoted by Bischoff, 2015).

## 2. China[11]

### 2.1 An overview of the information and communication technology sector

The growth of China's information economy has been significantly higher than the growth of its GDP. This share of information economy in GDP has been increasing, growing nearly three-folds from 2002 to 2015.

China has been the world's largest mobile market for over a decade. As of June 2016, there were 1.3 billion mobile phone subscriptions (GSMA, 2018) in China for a population of 1,383 billion[12]. China Mobile is the world's largest mobile operator with 850 million subscribers. According to the China Academy of Telecommunication Research (quoted by Waring, 2017a), China's 4G subscriber base was predicted to reach one billion by the end of 2017, after adding more than 240 million LTE users, 43 per cent of global 4G connections (762 million connections).

In December 2017, China had 772 million internet users according to the Chinese agency China Internet Network Information Center (CMS China, 2018[13] quoted by CMS China, 2018). Mobile remains the main factor boosting the growth of internet users the number of mobile internet users in China reached 753 million, mobile "netizens" accounted for 97.5 per cent of the total "netizen" population.

Today, China is the largest internet market in the world and has surpassed the USA in 2013 to also become the number one e-commerce marketplace. China has a highly developed e-commerce sector, with more than 30 per cent of the Chinese population already using internet payment systems. Mobile shopping accounted for nearly 80 per cent of the revenues of the online shopping industry in 2017 (iResearch, 2017). For instance, mobile devices are now generating 80 per cent of the retail turnover of Alibaba in China (Waring, 2017b).

China has become a powerhouse in handset making, having engineered a tech ecosystem in Shenzhen comprising handset and chip-makers to drive scale, which is underpinned by skilled yet cheap labor (GSMA, 2016a, p. 23). The Chinese manufacturers and the Shenzhen ecosystem, notably Huawei, Oppo and Xiaomi, are pioneers of the low-cost smartphones. Chinese handset makers made 36 per cent of global smartphone shipments in the first quarter of 2016, much of which in the sub-$200 category (GSMA, 2016a, p. 23).

VC funding in China has grown seven-fold in the last five years, from US$7bn in 2010 to US$49bn in 2015. VC funding nearly tripled between 2013 and 2015. China now, second only to the US (US$72.3bnin 2015), accounts for three times more investment than all the European countries put together (EY, 2016). The Startups Ecosystem Ranking report, introduced China for the first time in its 2017 edition, and not unexpectedly, it found Beijing and Shanghai ranking fourth and eighth, respectively. The report notes that the Chinese ecosystems scored high in terms of performance[14] and funding. According to the report, Beijing is home to 4,800-7,200 start-ups and Shanghai to 1,800-2,700.

### 2.2 The "Three Kingdoms" strike back[15]

China is a leader in the "apps" economy especially with video games. China became the number one market in the world for video as well as mobile games. The consultancy Newzoo (2018) predicts revenues of US$32.8bn in 2018, whereas in 2003, China's online gaming industry revenues were US$157 million (over 13.8 million online players; Chwen, 2005). Online and video games have become important forms of entertainment, with a strong appeal for the youth segment (Kshetri, 2013, p. 17). "For most Chinese Internet users, online game, which is considered to be the equivalent of the TV for American baby boomers, has become the dominant and popular form of cultural pastime and entertainment" (Kshetri, 2013, p. 1). This has to be understood in a context where broadcasting is perceived as in the hands of the Government (all TV stations are state-owned[16]); alternatively, new media such as video-on-line (Newzoo 2014d, p. 12) enjoy more freedom.

Newzoo described China as "Asia's rising star" for mobile gaming. China is by far the most dominant market when it comes to mobile games, with revenues of US$10bn as of 2016 (GMC- Newzoo, 2017). The case of Tencent illustrates the evolution of the Chinese games market from online PC games to mobile games. In 2013, Tencent became the number 1

gaming company in the world. Its revenues amounted to US$8.7bn in 2015, US$10.2bn in 2016, representing a 10 per cent share of the global market, and up to 13 per cent with the inclusion of Supercell's revenues (acquired by Tencent in 2016; Newzoo, 2017c). Tencent is China's biggest social network and online entertainment company, and owns a big chunk of the global mobile gaming market. In 2017, Tencent was the first Asia-based IT company to hit a market cap of US$500bn (China Tech Insights, 2017), slightly overtaking Alibaba (US $442bn) and ranking in front of leading global giants such as Facebook (US$440bn). Tencent is becoming one of the most valuable tech companies in the world[17]. NetEase ranked second in the Chinese video games market with US$8.3bn revenues in 2017 (Annual Report 2017). The two companies account for nearly 50 per cent of the Chinese market.

For historical reasons, consoles, having been banned[18] from the Chinese market for a significant period of time, are only representing a very small fraction of revenues. It enabled the PC-based game market segment to grow in the meantime. Hence, PC games played a major role in this market. As in South Korea (Wi, 2009), cyber-cafes have been instrumental in kick-starting the market. Although their role has been decreasing in both markets (Newzoo, 2014d, p. 11), interaction with fellow gamers is clearly highly valued, and they remain a feature of local sociability. The share of PC games is decreasing (client and browser games) and the share of mobile games is growing.

Mobile gaming accounted for more than half of China's total online gaming market for the first time in 2016. Mobile games play a key-role in the development of the Chinese digital content ecosystem, what the CNNIC (2017, p. 76) labels "video echo-sphere". It features live streaming, online shopping mall, games and e-sports, literature, social networking and movie ticket sales. The agency gives some impressive figures for 2016: 82.2 per cent of mobile internet users, read news on their phones, 57 per cent played online games, 43.7 per cent read literature on line, 67 per cent listen to music and 72 per cent were watching video on line (watched through "apps" such as Weibo or WeChat). China had 344 million live streaming users accounting for 47.1 per cent of all netizens. In turn, this has been prompting upstream and downstream industries of the entire digital entertainment market to thrive. For example, all the major websites invested in the production of drama: in 2016, a total of 16,938 episodes belonging to 4,430 online dramas have been produced.

*2.2.1 From Koreanization to "Chinesation": evolution of the market.* In 2003, the Chinese market was characterized by "Koreanization", with more than 70 per cent of digital games in China coming from South Korea (Chwen, 2015). Within the Top 10 game rankings for that same year, 80 per cent were Asian games, 50 per cent Korean games and very few were from western countries. *Lineage* and *Ro*, two of the most popular games in 2003, were both from Korea. It is worth noting that Tencent took off with the release of popular Korean PC games in China, such as "CrossFire" and "Dungeon and Fighter".

Over a decade later, Chinese consumers are spending almost all of their time and money on Chinese internet platforms. Baidu[19] is predominantly used by China's internet consumers. Despite a few global games that ranked among China's most popular, local games (domestically developed games) represented, as of 2013, as much as 57 per cent of the sales (Newzoo, 2014a, 2014b, 2014c). Three years later (as of December 2016), the ten top grossing android and iOS games were all Chinese, with the only exception of "Clash of Clans" (ranking 6) for Android games (Newzoo, 2017) [...], but the Finnish company was acquired by Tencent in, 2016.

Client games (role playing games and casual competitive games) are by far the biggest segment, followed by Web[20] and mobile games (Newzoo, 2014d, pp. 21-22). PC-based massively multiplayer online role-playing game[21] and FPS[22] games dominate in terms of the revenues they generate. The most popular of these games, "Crossfire"[23] and "Blade & Soul"[24], are still South Korean games. Action role playing games (RPG) were indeed the most favored genre, led by PC-based gamers in 2014.

In the early 2000s, with the development of internet in China, some first movers introduced foreign online games and operated them in China through some type of agent/intermediary. Such an operating model without R&D helped diversify the game market in China and saved some costs. A first period of growth was characterized by a strong reliance on various forms of piracies. However, one unexpected consequence of the role of piracy was that Chinese game companies (Kshreti, 2013, p. 3), just like South Korean game companies (Wi, 2009), came up with innovative business strategies to circumvent the risk. It led to the creation of the free-to-play model, which dominates by and large the Chinese market, the introduction of in-games advertising and the blooming market of virtual items. Tencent is a pioneering company in that field and has converted most of its hundreds of millions of social-media users into paying customers, mainly for virtual items in games. Free-to-play games are still the "reigning kings of China's PC market" (Custer, 2016).

Later, with experience and capital, the Chinese companies began developing games by themselves, though videogame R&D consisted mostly of copying foreign games structure and adding some Chinese traditional features (i.e. localization[25]). New intermediaries focused exclusively on helping foreign firms localize and publish their mobile games in the Chinese market. For example, Yodo1 (Simon, 2016a), or iDreamsky, the largest independent mobile game publishing platform, became a successful mobile games publisher since 2015.

The increase in locally produced games is also grounded in the specificity of Chinese culture. Uncountable games, including multiple top MOBAs[26], all draw from the seemingly infinite well that is the "Three Kingdoms" setting. This historical period (CE 220-280) has been greatly romanticized in the cultures of China, Japan, Korea and Vietnam. It has been celebrated and popularized in operas, folk stories, novels and, in more recent times, films, television and video games, becoming the default setting for any Chinese games developer.

Very recently, the growth in devices capable of virtual reality (VR) and augmented reality (AR)[27], and as the recent explosive growth in mobile content, triggered an increase in the AR/VR audience, an audience still limited to early adopters. Baofeng Mojing, DeePoon and Huawei are the manufacturers of VR headsets. In the end of 2016, more than 15 million mobile devices in China had virtual reality apps installed. AR, meanwhile, lagged behind, with a user base of over 5 million users (Newzoo, 2017b).

Despite the difficulties Chinese companies face in reaching Western markets, internet firms such as Alibaba, Baidu and Tencent have been making recent moves outside their home markets as they look for new growth opportunities. Tencent has, for years now, been one of China's biggest overseas investors. The acquisition in 2016 of Supercell, the Finnish mobile game developer, for a whopping US$8.9bn, stands probably for the largest acquisition in the video games industry. After establishing offices in South Asia, in 2015, NetEase opened up, a US office, with plans to expand their offerings by releasing mobile games for Western audiences, "culturalized" versions of their successful Chinese games.

## 3. India. The new kid on the block[28]

### 3.1 An overview of the information and communication technology sector

According to the Indian trade association Nasscom (2017), the total IT-BPM (Business process management) industry reached aggregate revenues of US$143bn in 2016, with the IT software and services industry accounting for US$75bn of revenues, BPM accounting for US$28bn. In total, 108 billion are coming from exports, and 24 out of the 28 billion of BPM revenues are generated by exports. The contribution of the IT sector to India's GDP rose to approximately 9.5 per cent in 2015 from 1.2 per cent in 1998 (IBEF, 2017). Today, India has become the largest IT outsourcing destination in the world, with about 55 per cent of the

global outsourcing market share. This industry was the largest private sector employer in India, with about 3.5 million employees in 2015.

The United Nations Conference on Trade and Development (UNCTAD) World Investment Report 2016 (quoted by IBEF, 2017) stated that India acquired the tenth slot in the top ten countries attracting highest FDI inflows globally in 2015. India's start-up ecosystem is evolving fast. With around 4,200 tech startups as of end-2015, India is the world's third largest tech start-up hub in terms of number of technology-driven start-ups, after the USA and UK, according to a report by the Associated Chambers of Commerce of India (Assocham; quoted by IBEF, 2016). According to the study, Bengaluru has the largest number of technology start-ups in India (being host to around 26 per cent of domestic tech start-ups), followed by Delhi NCR, Mumbai, Hyderabad and Chennai.

Major global VCs and hedge funds, from both the West and East are active in India. Angel funding networks have also been coming up in both the established and emerging hubs of the country. India raised US$8bn of VC investments in 2015, an annual increase of 43 per cent (EY, 2016), up from US$1.8bn in 2013 (EY, 2014, p. 10). In March 2017, India's top e-commerce company Flipkart announced it was looking to raise up to US$1bn (Phartyyal, 2017). The company was acquired in May 2018 by Walmart for an impressive US$16bn. Bangalore ranks 20th in the Startup Genome (2017) report, which estimates between 1,800 and 2,300 number of active start-ups.

By the end of June 2016, India had 616 million unique subscribers (GSMA, 2018) and over 1 billion mobile subscriptions (Kemp, 2017b, p. 103). A little over a third (35 per cent) of India's 1.3 billion people is connected to the internet: 462 million (Kemp, 2017b, p. 103). Only 17 per cent were accessing the internet on a daily basis in 2015 (Google's consumer barometer, 2017a, 2017b, 2017c). Indians spend eight hours a day online on average (Chakraberty, 2017). In 2016, India overtook the USA to become the world's second-largest smartphone market, with an installed base of 275 million devices. The adoption is likely to accelerate as operators are developing low-cost smartphones.

In 2014, Google released an affordable smartphone for developing markets, a first-generation Android One model. The 4G operator, Reliance Jio, launched its own-brand LYF smartphones in June 2016, with a number of models offered for US$50 or less. Reliance Jio and Google are now developing a low-cost 4G smartphones (Waring, 2017c).

The internet population is expected to reach approximately 746 million by 2020, and a large number of consumers expected to get introduced to using digital platforms. India is considered the last big internet market. The e-commerce segment has been significantly growing reaching US$17bn, a 20 per cent growth over 2015. Flipkart, although not profitable (Simon, 2016a), is leading the Indian e-commerce market, ahead of Amazon.

India has a very strong and flourishing media and entertainment industry, described as a "sunrise sector" by KPMG (2016), which is still growing fast (see Figure 16). The Nasscom–Google 2015 study predicted an almost 14 per cent growth ratio between 2014 and 2019 (twice the global media and industry forecasted growth), which means that revenues will almost double over that period. With a production of 1,250 films in 22 different languages, India is the world leader for the production of films, yet not so for their revenues). The Indian film market derives almost 90 per cent of its revenues from non-English language movies. It is largely dominated by Hindi films, followed by South Indian films and other regional films. Bollywood was an almost 2-billion-euro movie industry in 2015, with around 2 billion admissions (Statista, 2017). The country is the world's second largest TV market by viewers; 890 channels are available (about 400 are news channels and 167 pay channels), while 0.139 million Indian households subscribed to cable or satellite pay TV. Globally, India has the biggest newspaper market, with more than 330 million copies sold daily and more than 100,000 registered

newspapers (Deloitte, 2016a). In the wake of Reliance Jio's aggressive strategy of subsidized, unlimited 4G access, video streaming is booming ushering in new companies such as Hotstar, now one of the most used video streaming apps in the world, driven almost entirely by its Indian audience (50,000 hours of cinema and TV, in 8 Indian languages, a streaming company, which is a subsidiary of Star India, through Novi Digital Entertainment: www.hotstar.com/about-us).

Backed by over a decade of macro-economic performance, a strong growth in smart device penetration and usage, broadband penetration and the uptake of 4G, the digital sector is expected to get a huge boost. A growing Indian economy, poised to becoming the fourth largest economy, has seen a surge in the domestic demand for leisure and entertainment services. Digital adoption is at a tipping point owing to wireless broadband availability. The Indian digital segment is expected to cross INR200 billion (US$2,999bn) (including digital advertising, video subscription, music subscription and gaming revenues) by 2020.

### 3.2 Cards, cricket and Bollywood

After being a rather dormant market, surging adoption of low-cost but powerful smartphones has enabled mobile gaming to take off in a big way since 2010. India is well positioned to become the next major gaming market. As of 2016 (KPMG-FICCI, 2017, p. 2), revenues reached 424 million euros, out of which casual games accounted for over 50 per cent, generating 220 million euros. The total game revenue in India is forecasted to reach $1.1bn by 2020 (AppAnnie, 2016). India took fifth place in the global video games market (by downloads). It is expected to surpass both Russia and Brazil in the coming years. According to Nasscom (2016), the Indian gaming industry was close to US$890 million, and there are over 100 game development organizations in India already. AppAnnie-Nasscom Gaming Forum (2016) predicts downloads for all games in India to reach 5.3 billion by 2020, generating revenues of 1 billion euros.

India has skipped the PC internet usage phase and directly jumped on the mobile internet wave. The downside of the low-cost smartphones penetration (65 per cent of the devices in India cost less than INR10,000[29]) is the limited storage capacity (more than 40 per cent of the devices have less than 8 GB of on board storage; Tech, 2016). This introduces a technical constraint as games designed for the Indian market have to be small in size and efficient in terms of resource use.

As of 2015, Nasscom estimated that the number of PC Gamers fell between 5 and 7 million, out of which 1/1.5 million were "hard core" gamers, with installed bases of 50 million PCs. This segment is dominated by franchised games such as "FIFA", "Grand Theft Auto", "Assassins Creed" and games based on cricket. The console segment (including games on TV sets) is of the same magnitude, a limited market owing to high price points and cost of games: 3/4 million gamers. Sony and Microsoft dominate with Sony's Play Station addressing a larger customer base, 3-3.5 million (including "grey" market imports) and Xbox 360 accounting for around 2 million. Nasscom's study deemed that this figure is likely to be lower owing to obsolescence of consoles. In spite of this customer base, a distributor, Milestones, was created in 1997 to serve these two niche markets, first for the distribution of PCs and games on PCs, and then for consoles. This firm from Mumbai entered games publishing in 2002 to feed these two markets. In 2009, the firm started online distribution through a subsidiary Game4u that opened shops after 2011. The group claims being number one in India for retail.

With only 3,000 cyber-cafes (half of them only with 5 machines or more), reaching an estimated 250,000 active PC/MMO[30] players, it is hard to compare the role of cyber-cafes in India with its role in China or Korea. The most popular games were "Counterstrike", "DOTA", "League of Legends" and "World of Tanks".

*3.2.1 Sketching out the main players.* Owing to the lack of precise data[31], it is difficult to provide an accurate view of the structure of the markets and of its main players. One can follow the historical presentation of Nasscom–Google (2015). Before 2005, the field was left to a handful of early innovators (Diruva, IndiaGames, Lakshya, Parado and Raptor Entertainment) who provided early PC game titles. Between 2005 and 2010, early feature phone mobile games were introduced. Global players entered the market and started setting up backend operations and studios, EA Mobile in Hyderabad, Ubisoft in Pune and Zynga in Bangalore. The number of companies operating in the market went up to 25. After 2010, the number zoomed up to over 200. This period saw the development of social/PC games as well as mobile games.

Keeping in mind the characteristics of the Indian IT industry, it is not surprising to find that on top of the usual players of the game industry (developers, publishers and distributors), another group, the software services providers, stepped in. These offshore providers create content and game art, and co-develop games and activities, which, respectively, provided 50 and 20 per cent of their revenues in 2014. For example, "GameShastra" was founded thanks to a million-dollar contract from US Activision. In 2012, Disney bought their creation studio. Games companies often blend the more traditional aspect of game production with the provision of such services. 90 per cent of the developers surveyed by Nasscom–Google (2015) provide such services.

The second feature is linked to the mobile dimension that enabled independent companies to grow in this fast-evolving market. They accounted for 65 per cent of employment in the studios. Half of the companies have been created after 2012. Most companies are small, 60 per cent of them employing less than 10 people, only 10 per cent employ over 200 people. This, in turn, translates into revenues falling under 160,000 dollars for 69 per cent of them; only 25 per cent of the companies have revenues over 1.6 million dollars. The remaining 75 per cent are aiming at the global market. First and foremost, mobile games are developed (96 per cent); social Web games follow with 22 per cent of them and 18 per cent "casual" games. Free-to-play is the dominant business model for over 60 per cent of the developers. However, monetization is quite an issue in a country where the willingness to pay is almost nil; only 1 per cent of the players are paying. 50 per cent of Indian gamers have a budget of INR200 (27 euros) or less to pay for mobile games (Gamesbond-Mauj, 2016, *Whitepaper[32]*). The same report reveals that, as of 2016, 80 per cent of the game developers felt that they were better off developing games targeted at North America and Europe, for greater benefits from the monetization opportunities in those markets.

In such a price-sensitive market, it comes as no surprise that revenues stem from advertising rather than from sales of virtual items in apps that stood for only 15 per cent. Availability of network connectivity often hampers "in-app" purchases once the game has been downloaded. But advertising being heavily dependent on bandwidth may also spoil the user experience. Therefore, companies are trying to find either alternative funding, such as sponsorship, or make advertising more attractive to users by linking it to the progression within the game. Lower in-app purchases (IAP) have been also introduced to match the incomes of Indian gamers and to encourage more buying. Worth US$0.15, a new minimum IAP tier was introduced specifically for the Indian market by Google Play in July 2015. The following year, in June, the iOS store did the same and lowered the minimum price of an app.

This strong IT/software-flavored industry explains why the location of the video games industry mirrors that of the IT industry[33]: 60 per cent of the companies are located in the first three first-tier cities: Bangalore, Mumbai/Navi Mumbai/Thane and Pune, the Indian poles of technological excellence, together with Hyderabad, Delhi/New Delhi and Kolkata.

There are no data on the distribution of revenues within the industry; however, one can assume that the largest players (developers and service providers) account for the majority of revenues. One can expect them to structure the market. This has been the goal of Nasscom with the creation of its Game Forum Working Group and the launch of the Nasscom Game Developers Conference (NGDC) to promote Indian games. Reliance Games, one of the leading companies (see Box 1), founded its own conference, Pocket Gamer Connect, for the same reason. The firm from Mumbai explicitly claims an active role in the structuration of the industry, partnering with small gaming studios and funding start-ups (PTI, 2016). Reliance is considering starting an accelerator program for gaming entrepreneurs. Nazara, another major game company, did the same, creating funds in 2013 and 2014, and has just launched an eSport initiative as well. UC Web (a subsidiary of Alibaba), the leading Indian mobile portal announced in 2016 an investment plan of US$20 million to also support start-ups.

---

**Box 1.** Reliance Games

Mumbai-based Reliance Games is a leading publisher and developer of block buster hit mobile games such as "Real Steel" and "Real Steel World Robot Boxing". The firm owns a game portal Zapak and provides services to third party.

Reliance Games is the mobile gaming division of the Anil Dhirubhai Ambani group's Reliance Entertainment (Reliance BIG Entertainment Private Limited). The company provides music, sports and internet and mobile portals, as well as user-generated content. Reliance Entertainment itself is a subsidiary of one of India's largest conglomerate, and the Reliance group is one of the largest employers in the country, with revenues of US$44, 7bn for fiscal year 2015-2016. The group owns Reliance Communications, one of India's foremost and truly integrated telecommunications service providers, with a customer base of over 118 million, including over 2.8 million individual overseas retail customers. Reliance Jio has a very aggressive strategy of 4G deployment and free data packages that drove the other operators to slash their data prices.

Reliance acquired in 2009, DreamWorks Studios and set up a joint subsidiary with Steven Spielberg, Amblin Partners, investing US$1bn. Reliance Games builds on Bollywood and Hollywood content to develop games (contracts with other major Hollywood providers Nicolas Cage's Saturn Films, Jim Carrey' JC 23 Entertainment and George Clooney's Smokehouse Productions). The firm has a portfolio of 20 games, claims 200 downloads in 2016 and an audience across 45 countries.

Zapak, with 10 million registered gamers, integrated in 2008-2009, is India's number 1 gaming portal according to the company, offering free games. Zapak has a wireless application protocol (WAP) site called m.zapak.com which is, according to the company, the world's first multiplayer platform for feature phones. It offers over 1,200 free games and boasts of over 2 million unique visitors every single month.

Jump Games was also included during the same period. In March 2010, Reliance Entertainment acquired a 50 per cent shareholding of Codemasters, a UK game company employing over 500 people in development and publishing, which claims to be the world's leading racing games developer (www.reliancegames.com/, www.rbe.co.in, www.relianceada.com, www.zapak.com/).

*3.2.2 in spite of a strong cultural component a market under Western influence.* In sharp contrast to the Chinese scene, "global" titles such as "Candy Crush Saga", or "Clash of Clans" are still dominant across downloads, revenues and usage rankings. Among the top ten games by downloads, one finds only one Indian game, "Train Simulator 2016", which ranks fourth based on settings from India's railway network, published by Timuz, one of the big Indian developers. "Teen Patti" (published by Octro) and "World Cricket Championship 2" (published by Nextwave Multimedia) ranks eighth and tenth, respectively, going by time spent. By revenues, Octro's game ranks fourth, and two other Indian games are also listed: "Ultimate Teen Patti" (published by Play Games 24x7) ranking sixth and "Teen Patti Gold" (released by Moonfrog) ranking eighth. As a consequence of this domination of global games, Indian publishers collected only 15 per cent of the revenues in 2014 (Nasscom, 2015).

Local publishers have been enjoying increasing success in simulation, sports and social card games. Indian successful games, such as those of Timuz, are characterized by a strong cultural component, i.e. social card games, or cricket games. "Teen Patti" is a simplified version of poker, very popular throughout South Asia. Social card games are an opportunity to interact with friends and family. The business model is grounded on gifting through virtual chips, a common feature among the top revenue generating games in India. These are intergenerational games, and sending gifts increases engagement and contributes to the growth of players.

Cricket is India's most popular sport, ranking just after movie-going as a form of entertainment. Game developers such as Nazara, sign up cricket stars to create games. Reliance inked a deal with a premier league team "Gujarat Lions", becoming the official partner of the Rajkot-based team. The games allow players to customize their team and engage with their favorite stars.

A third cultural factor lies with the exploitation of IP rights from Bollywood movies. Robosoft released "Dhoom: 3" and "The Game and Fan: The Game" both of which went hit the top ten games ranking by downloads in India. "Sultan: The Game", released by the same company, through its games department "99 Games", was adapted from the huge Hindi film success. The game became a hit. Reliance can also benefit from its portfolio of rights from Hollywood, localizing the games. Localization anticipates the demand for new content from new categories of players outside the big cities. Indeed, if urban Indians tend to play games such as "Candy Crush" and "Temple Run", and are acquainted with high production quality games, then rural India may require a different kind of approach according to Anila Andrade (AVP Operations at 99Games, quoted by Madanapalle, 2017).

Indians spend eight hours a day online on average, the six-and-a-quarter hours more than the Chinese. Ironically, Chakraberty (2017) notes, "presumably, a significant portion of the time in India goes into waiting for pages to open or videos to download". Indian women spend six hours playing games such as "Candy Crush" where they can compete with their women friends. The Gamesbond–Mauj survey reveals that consumption of games is higher among women with 63 per cent[34] of them playing daily (at home, 98 per cent), and 33 per cent of them downloading more than 5 games a month. Women are bigger consumers of games but use cheaper phones with smaller capacities (quoted from the previous Gamesbond survey, Tech, 2016). Puzzle, strategy and casual games are the most popular among women players.

Women gamers in India demonstrate a divergent demographic trend from the male gamers with 59 per cent being in the age group of 30 years and above (40 per cent homemakers) *vis-à-vis* only 24 per cent of male gamers according to the same survey. Women accounted for 22 per cent of the 150 million regular mobile gamers in 2016 (Tech, 2016 quoting the Gamesbond 2015 survey). Mobile-only-gamers are mostly women (54 per cent), but multi-platforms gamers are mostly male (67 per cent); women are more reluctant to pay for

games than men. As stated in the Gamesbond 2015 survey, although fewer in number, women are power gamers with a significantly longer gameplay duration (Shah, 2016). Age-wise, older gamers are also most likely to play mobile-only-games *vis-à-vis* younger gamers. As of 2015, male gamers represented about 60 per cent of the total players. Men favor action games (shooting games, sports games, etc.) and racing games. More than 70 per cent of the Indian casual gamers were under 34 years of age, more than half of them in the 18 to 24-year-old bracket (Sompinmäki, 2015).

## 4. Russia: "from turnips to tanks, the changing face of Russian video games"[35][36]

### 4.1 An overview of the information and communication technology sector

The economy, which had averaged 7 per cent growth during 1998-2008 as oil prices rose rapidly, has seen diminishing growth rates since then owing to the exhaustion of Russia's commodity-based growth model. As noted by IDC, ICT expenses in Russia steadily followed the oil price dynamics (quoted by Russoft, 2011 Survey, p. 12). The Russian IT market is still developing even in the context of a significant reduction in total sales. According to Russoft (2016), this apparent paradox relates to the fact that users (both private and corporate) continued to increase their consumption of software and of IT-services though less intensively than in previous years (Russoft, 2016, p. 149). The market value of the sector[37] was US$23bn in 2010 and fluctuated between US$18 and US$28bn according to sources in 2014. IT services was the largest segment in 2013 (20 per cent), growing since 2010 (17 per cent), as did the software segment. No 2014 data were available for the Russoft (2016) Survey (released, December 2016); the report assumes that no major change in the distribution took place that year. Nevertheless, according to IDC (2017), Russia remains one of the world's larger ICT markets, but its size and growth potential are very different today from what they were in 2014.

As in India, exports of IT services and software have been growing. The software segment (Russoft, 2011) claims that the better results achieved by this subsector are linked to its lack of dependence on the state, generating less corruption and stronger competitiveness. Russian software programmers, both working for national software vendors and service providers as well as for international companies demonstrate one of the few successful examples of full integration in the global market.

The telecommunications services market is the larger market within the ICT sector. It accounted for 44 billion euros of revenue in 2014. It is, by and large, a mobile communications market with a low fixed line subscription, 25.5 per cent in 2015, even decreasing from 31.3 per cent in 2010 (World Bank, 2017). In sharp contrast, the country's mobile penetration rate topped 165.5 per cent in 2010 (World Bank, 2017), but the ratio went down to 160 per cent in 2015. Russia is Europe's largest mobile market by connections (250.2 million, GSMA, 2018b), and has been growing strongly in recent years. However, as Russia continues to struggle with a challenging macro-economic outlook, the growth rate has decreased from 13 per cent in 2010 to a mere 1 per cent in 2015 (GSMA Trends, 2016). Mobile penetration levels are not evenly distributed across the country, showing some digital divide between urban centers where the penetration peaks (such as Moscow and St. Petersburg), and most regional areas. Three leading companies dominate the market, MTS, Megafon and Vimpelcom.

The number of households with a computer went from 41.3 per cent in 2010 to 72.5 per cent in 2015. Although fixed broadband subscriptions are increasing, from nearly 11 per cent in 2010 to almost 19 per cent in 2015, the internet is also going mobile. Internet penetration reached 71.3 per cent in 2016 (over 100 million users), from 18 per cent in 2006 (Internet Live Stats, 2017). 66 per cent of internet users were accessing internet daily in 2015 (Google's consumer barometer, 2017a, 2017b, 2017c). Again, the penetration is uneven:

80-85 per cent in Moscow/St Petersburg but the penetration nevertheless exceeded 50 per cent in villages and small towns. The government is investing billions of rubles in a 200,000-km telecom network, which will provide a 10Mb/s broadband service to thousands of underserved villages, improving IT services to 37 million rural citizens. The size of the entire Russian internet economy was estimated at about US$26bn in 2014 (Russian Association for Electronic Communications, as quoted by Russoft, 2016).

Internet access services and mobile data services are boosting the market. According to GfK (quoted by East-West Digital News, 2016), mobile internet access in Russia more than doubled during 2016. Around 50 million Russian users (42 per cent of the adult population) accessed the internet from mobile devices as of late 2015: 37.5 per cent of users, 16 years and older, went online by way of their phone and 19.5 per cent via tablets (East-West Digital News, 2017). According to J'son & Partners Consulting's estimates (quoted by Russoft, 2016, p. 41), the number of mobile application developers in Russia increased over three years by a factor of 2.5 and in 2013 amounted to 4,100[38]. Russia accounted for only 1 per cent of the global app market in 2014. Majority of revenues was generated by games (97 per cent of all digital content in Russia; Newzoo, 2014a, 2014b, 2014c).

Russia is one of the countries (alongside with China, South Korea, and the USA) having national internet-search engines of a global scale (Mail.Ru, yandex.ru; Makarov et al, 2011). As in the case of China, with IT companies such as Tencent and Baidu, these Russian IT companies managed to retain a strong advantage over Google, as measured by the number of users. Mail.ru is the leading email service in Russia and the sixth largest in the world. This background enabled the two Russian internet leading IT companies, Mail.Ru (see Box 2) and Yandex, to go through successful IPOs in 2010 and 2011, respectively, raising US$912 million and US$1.3bn.

E-commerce has been growing, reaching around US$12bn in 2016 (800 billion rubles[39], up 23 per cent from 2015[40], vs 235 billion rubles in 2011) on top of the US$4.3bn of cross-border sales. Interestingly, since mid-2014, only Chinese players have benefited from the growth of the Russian cross-border e-commerce market. In 2016, deliveries from China accounted for more than 80 per cent of total fulfilled cross-border orders. AliExpress (a subsidiary of Alibaba) had become, in 2014, the number one e-commerce platform in Russia, by the number of downloads on Google Play, ahead of social networks and IM services (East-West Digital News, 2017, p. 20). AliExpress introduced mobile payment with Alibaba's in-house payment system Alipay, partnering with Russian payment company Rapida and mobile solution provider Soyuztelecom. Over 40 per cent of orders are coming from mobile devices (East-West Digital News, 2017, p. 5).

Nevertheless, the market is highly fragmented. The economic crisis has been hitting the segment hard, and led a range of players to suspend their activities. However, some are doing better than others, and are still witnessing a fast growth.

Russia can boast some innovation hubs but few. Moscow, 13th in the Compass ranking, is one. The number of start-ups has been growing (https://startupgenome.co/russia). The innovation ecosystem may need some strengthening. As Gokhberg and Roud (2016) put it "The Russian experience shows that, for nearly 90 per cent of enterprises, engagement in innovation activity, even at the national level, is not the most popular business strategy [...]". They stress the stability of innovation indicators, noting that, for instance the share of expenditure on technological innovation in total output remained flat over the last 20 years. The OECD (2011) report was very critical of Russia's innovation system. The report claimed it was by undermined by low levels of R&D and innovative initiatives in firms, lack of competition and corruption and weak infrastructures and regulations.

However, the Russian Government is taking some measures. In 2013, the state-backed venture fund and start-up accelerator Internet Initiative Development Fund (FRII in Russian)

was launched. In 2016, the percentage of total government support (direct and tax) to business R&D was the highest in the world (OECD, 2017).

According to Rusbase (2013), 2013 was a pivotal year for the Russian IT venture market with 497 investments made in start-ups, worth a total of US$1.1bn. Most of the venture community is based in Moscow, but in recent years, the start-up infrastructure has been improving, with, for instance, techno-parks thriving in Kazan and Novosibirsk. According to the Startup Genome (2017) report, Moscow boasts 1,500-3,400 start-ups. However, Moscow fell from its position of 13th in the 2016 ranking of the report, to below 20th, in spite of having one of the strongest talent pools in the world.

### 4.2 From "Tetris" to "World of Tanks"

"Tetris", the visual–spatial geometric puzzle, one of the worldwide video game phenomena[41], was created in 1984, by Alexey Pajitnov, a Russian computer engineer. Ten years later, it was the first game[42] to be loaded on a cell phone in anticipation of the growth of the mobile games[43] (Nick, 2014). The Russian markets have been through some ups and downs since then. However, the Russian gaming market, once tagged as "emerging", has been growing fast since 2010. With steadily rising industry revenue reaching US$1.4bn as of 2016, Russia's video game market is becoming the largest European market (Newzoo, 2016b). According to the same consultancy, Russia ranked 11th in the world for video game revenues in 2016. Newzoo (2015b) predicted revenues of US$1.5bn in 2018.

Newzoo (2016c) estimated that in 2016, 65 per cent of the active internet population aged 10-65 years played games. As of 2016, there were 59.5 million gamers in Russia and 40.4 million were spending money on games, a payer-to-player ratio of 56 per cent. A typical Russian online gamer spends US$35 per year on online gaming. For many Russian gamers, those purchases include games, accessories, or in-app purchases.

*4.2.1 A market driven by free-to-play and mobile games.* The strong growth is mostly owing to the relevancy of the free-to-play (F2P) business model for the Russian market. On the one hand, this model fits with the (limited) purchasing power of Russian gamers, as well as with a culture described as a "culture of free media" (Terekhin, 2016). Gamers can freely access games and then decide to buy or not, virtual items or any other complements. On the other hand, as in in Asian countries, it has been an appropriate means to circumvent the high level of piracy that has been plaguing the media and content industries[44]. This also explains why advertising is an important source of revenues (see the distribution of revenue of Mail.Ru for instance, Box 2):

---

Box 2. Mail.Ru

Mail.ru Group develops internet communications and entertainment services in Russia and globally. They describe their strategy under the neologism "communitainment" (communications + entertainment). The Mail.ru Group Limited is a holding company. The company owns Russia's leading email service and one of Russia's largest internet portals, Mail.ru. The company operates three of the major Russian language social networks, VKontakte (VK), Odnoklassniki (OK) and Moi Mir (My World) and Russia's largest online games, including such gaming titles as "Warface", "Armored Warfare", "Skyforge" and "Perfect World". The company operates a leading OpenStreetMap-based offline mobile maps and navigation service MAPS.ME, two instant messaging (IM) services, Mail.ru Agent and ICQ.

In 2015, in spite of worsening macro-economic conditions, the company achieved a revenue growth of 11.0 per cent to RUR36,316 million. In 2016, it achieved revenue growth of 14.8 per cent, up to RUR42,751 million (on a pro forma basis). MMO games revenue grew 21.2 per cent Y-o-Y to RUR11,390 million. At the end of 2015, the

---

company had a total of 3,122 full-time employees. In 2006, Naspers, a major investor in Tencent, invested in Mail.ru; in 2009, its participation increased to 42, 88 per cent. In 2010, Tencent took a 7.8 per cent share of the company.

| | 2015 RUR m | % of revenue |
|---|---|---|
| *Group aggregate segment revenue*[(1)] | | |
| Online advertising | 14,630 | 40.3 |
| MMO games | 8,945 | 24.6 |
| Community IVAS | 12,508 | 34.4 |
| Other revenue** | 233 | 0.6 |
| Total group aggregate segment revenue | 36,316 | 100.0 |

*Source*: Annual report, 2015. Community IVAS payments for features and virtual items sold primarily on social networks[45].

The group started as a webmail service in 1998. In 2001, the Mail.Ru portal was launched. In 2006, the company launched the MMO game, "Legend: Legacy of the Dragons", followed by "Allods Online" in 2009. The following year the group completed an IPO on the London Stock Exchange. The first mobile game, "Jungle Heat", a war strategy game, was introduced in 2013. That same year, the company launched My. com in the USA. Mail.Ru is the most popular portal in Russia, with a monthly audience of 49.2 million users (TNS, all Russia, population ages 12-64 years, December 2016). With VK.com, Mail.Ru Group is the second biggest player in the Russian online video market.

With 175.6 million downloads of the games across social networks, Mail.Ru Games claims to be the leader of the interactive entertainment market in Eastern Europe. The group is Russia's leading provider of MMO and mobile games with a portfolio of both internally developed and licensed titles. Historically, the bulk of online games revenue has been generated by MMO games. These are played in "virtual worlds", hosted by networked games servers that allow thousands of players to connect and play simultaneously. The MMO first person shooter game, "Warface" has a leading position in the games portfolio in terms of revenues. About a quarter of revenues are generated by MMO games, including client, browser and mobile titles: players have the opportunity to buy in-game enhancements for these free-to-play games (Source: Mail.Ru, Annual report, 2014, 2015) (https://corp.imgsmail.ru/media/files/mail. rugrouparfy2015.pdf,https://corp.mail.ru/en/press/releases/9887/).

The country boasts the highest percentage of PC gamers globally, being the number 1 country for PC games. Russian games dominate this segment. "World of Tanks", a massively multiplayer online (MMO) launched in 2010, is a global hit for PC games with 80 million players worldwide (19 million only in Russia). The game, published by Wargaming (a Byelorussian firm created in 1995), introduced an original version of F2P: "free-to-win"; that is, even gamers who did not pay for the game can win. Strategy and role-playing games dominate in Russia (AppAnnie, 2015).

The strength of this model explains the low level of preferences of gamers for games on consoles: only 6.1 per cent (Xsolla, 2014), and only a 4-per-cent market share in 2014 (Newzoo, 2014a, 2014b, 2014c). Nevertheless, 32 per cent of gamers play on consoles that are often shared between players. Sales of software for consoles amounted to US$55 million, and for hardware US$85 million. M.video, a Russian distributor, accounted for over 20 per cent of the sales of consoles in 2014, at an average price of US$175.

Social games are ranking behind MMOs, but with a fast diminishing relative share as the audience is gradually migrating to mobile games. Russian mobile gaming continues to drive

the growth of the online gaming industry. Mobile games have become increasingly popular in the country as well; with 33.8 million players in 2015, especially on android devices, as in India. While a lot of popular games on the mobile sector use F2P pay mechanics, many titles seem to be able to survive without them owing to their low price of admission. Russian mobile gamers are willing to pay anywhere from US$0.20 to US$6.99 for their mobile apps (Russian Search Marketing, 2016). The country was 12th highest in worldwide mobile gaming revenue for 2015.

In terms of number of companies, game development is the largest sub-sector in the game industry but most likely not in terms of revenues[46]. Newzoo noted that there were approximately ten big game developers in Russia (Newzoo, 2014a, 2014b, 2014c). Developers rely on the publishers and will usually obtain between 20 and 50 per cent of the revenues collected by publishers from distributors. Four to five large companies have been competing in the publishing segment. The industry is now diversifying with big-budget, long-running series such as "Rages of Mages" or "IL-2 Sturmovik".

Playrix is another interesting case of a company, founded in 2004, initially specializing in casual PC downloadable games with their games published on portals such as Big Fish Games (a portal specialized on the distribution of such games). After having launched free-to-play games in 2009, Playrix took the mobile turn in 2013. The company became the Number-2 game publisher in Europe in 2016 (AppAnnie, 2016) and is listed among the top 20 global game publishers (AppAnnie, 2016, p. 10). Playrix specializes in casual titles such as Match-3 games and town simulations. Their games "Township", "Fishdom" and "Gardenscapes" have been in the top 15 of the top 50 grossing charts across more than 50 countries worldwide (Takahashi, 2016). To be noted, the company has been successfully self-publishing its games in China and Japan.

Wargaming has also expanded its presence in the eSports industry, with the Wargaming. net League. By the same token, Mail.Ru develops cybersport in Russia on the basis of "Warface". The company hosts "Warface" tournaments regularly and organizes the "Warface Open Cup".

Steam[47] was the market leader in digital distribution in Russia, in 2014, with its turnover exceeding all Russian competitors combined. EA's Origin ranks second, and uPlay by Ubisoft is third. The top local players are Mail.Ru Game Center, Gamazavr.ru and 1C Digital.

Russian game companies are also active in terms of R&D. In 2016, GS Group presented the GS Gamekit, the first Russian game console with HD set-top box functions. That year as well, Russian start-up Fibrum was expected to launch of a virtual–reality platform (East-West Digital News, 2016).

*4.2.2 Logic games, war stories and ''Gibberlings''.* The Mail.Ru group dominates the MMOs segment with four games among the top six (Newzoo, 2014a, 2014b, 2014c), with the only Western game "World of Warcraft" ranking sixth[48]. There are barriers to entry in that particular segment that could explain the lack of success of Western or Asian companies: language[49] that requires localization to deal with cultural patterns beyond mere translation, local marketing and payment. Foreign companies are required to establish local legal entities to accept game payments.

On the other hand, Russia, like India, can be attractive for outsourcing game development. Indeed, a lot of video games are developed in Russia as computer programming is cheaper than it is in Western markets and yet of the same caliber. Costs related to the development of an AAA game[50] in Russia are up to eight times lower than costs of a similar product in a Western country. Investing in a game company is another option adopted by Tencent, which took a 7.8 per cent share of Mail.Ru, in 2010.

In the 1980s, Russian game makers began to move toward logic and puzzle games, the kind of games that were socially acceptable and not suspect of any ideology. As stressed by Goodfellow (2014), in a climate where engineering, science and mathematics were highly prized, games such as these promise mental training. The 1940s are a fairly common setting in Russian fiction, video games included. From the early 2000s, Russian games have been drawing more heavily upon historical recreations of war, first-person shooters and military strategy games[51]: air battles ("IL-2 Sturmovik: Battle of Stalingrad"), tanks ("World of Tanks") or ships ("World of Warships"). These war games are also global hits outside Russia, as illustrated not only by Mail.Ru's "Warface", "World of Tanks" but also by Gaijin Entertainment's "War Thunder" (6 million gamers worldwide). These companies are building their international expansion on that niche market.

Other games aim at echoing themes of Russian culture and history. For instance, "Allods Online", from the "Rage of Mages series" developed by Nival Interactive, depicting two stereotypes, quasi-human races clashing with each other: the Russian idealisation of a simple, rural life and the Russian glorification of military power, progress and strong leadership. As Reddit put it, "fantasy titles, such as 'Allods Online' and 'Perfect World', represent a continuity of a national obsession with fantasy and illusion, that began in the wake of Soviet collapse with titles like 1998's 'Vangers'" (Reddit, 2015).

The Russian mobile gaming market is dominated by international players (AppAnnie, 2015). As opposed to MMOs, where Russian games dominate, one finds few Russian games among the top ten ranking games, either by downloads or revenues. Most of the top ten games are western games, with the "usual suspects" (e.g. "Class of Clans") leading for revenues.

Mobile gamers were mostly men: 58 per cent in 2014 according to Newzoo (2014a, 2014b, 2014c). Women dominate on social games. Data about the sociology of gamers are scarce, and recent data are difficult to find. However, Fedorov (2015, p. 445) quotes a 2012 survey that gives an average age of the gaming urban population of 33 years, with, at that time, 54 per cent of the gamers being women and 46 per cent being men. 60 per cent of the Russian internet users, in big cities (over 100 000 inhabitants), played video games. He adds, in another section, that the percentage was much lower in rural areas (quoting a 2010 survey).

## 5. Conclusion

As stressed in the first section, the internet is going mobile, driven by data, mostly video. The new mobile platforms are becoming the key for the distribution of content and mobile games are among the most popular apps on the platforms. At the global level, over the past few years, spending on mobile games surpassed spend for online gaming and consoles worldwide. As more consumers in each of the three countries purchase smartphones and access the internet through their mobile devices, the mobile gaming industry is bound to grow further.

Whether it is the history of browser games in China, mobile games in India, PC games in Russia, each national gaming industry has required a unique strategy for making money, building on some prominent cultural factors and adapting to the local economic conditions.

China became a leader for mobile games. China is becoming a major hub for game software development although it has to overcome some limitations stemming from an imitation-based culture, and a lack of originality. Online gaming is a remarkable example of an industry that is rapidly growing thanks to innovative business models of Chinese companies (Kshetri, 2013, p. 19), even if these models have been adopted to deal with some the issues they were facing, such as piracy. The "insularity" of Chinese games restricts their potential distribution; games such as "Jianxia Qingyuan 3", "Demi-Gods" and "Semi Devils", with millions of players in China, are not available outside the country. Besides, China's game industry seems to be having trouble producing a hit outside. The

aggressive M&A strategies of some of the companies, such as Tencent, can probably mitigate this limitation.

As highlighted, video games in India are largely untapped and offer huge growth potential. However, India, being the "new kid on the block" for the games business, it may be too early to anticipate some of the developments. The industry still has to face some serious challenges: the quality of its infrastructure (electricity and telecom), network conditions and connectivity (bandwidth and speed), limitations of the low-cost smartphones (limited storage), access to creative talent and the issue of monetisation. In a country plagued with a very low willingness to pay, convincing users to spend money on games remains indeed a challenge. As a consequence, there is huge discrepancy between downloads and revenues, much like in the case of Bollywood where box-office revenues do not match the number of films produced.

Players such as Reliance are very optimistic about the future of the industry. They consider that the coming years present a massive opportunity for India to become the second-biggest smartphone market in the world. However, without being overly optimistic, taking into account the growth potential of the country and the presence of the parameters that boosted the Chinese industry, it may vary between big enough (Russian model), big and very big (Chinese model).

In both countries, government are willing to support this industry, even if in the case of India the structure of the industry is mostly left to the market, to companies such as Reliance or trade associations such as Nasscom. However, the 2015 Digital India plan may have some indirect impact. Since the early 2000, the Chinese government has been pushing in that direction so as to create an improved environment, for instance with training programs for developers.

There is no such direct support in Russia. The Russian innovation ecosystem does not appear as favorable as its Chinese and Indian counterparts. In spite of some recent initiatives, innovation in Russia still fares poorly under the innovation radar. However, as noted, software does enjoy a better position in the global market, and being software companies, video games companies are a part of that privileged island, particularly because Russia is the "home" of PC gamers. Their MMO companies have been building on that strength and taking a key position in the niche market of strategy games.

Whatever the output, video games are now clearly a vital part of digital content production in these countries, and even a major part of digital content in Russia. The Chinese case shows how companies have been able, within a decade, to move from being copycats, to go beyond the localization of foreign games and produce games based on local content. The Indian market may follow a similar track taking into account the strong demand for local content in vernacular languages outside the big urban centers. Some of the content produced can reach an international audience, some may need to be localized. Locally relevant content is a key element of future growth and games catalyze this growth.

New countries are emerging in the video games industry such as Brazil, Turkey or Iran, and it would be interesting to see whether the analysis we propose will fit with the gaming profile of these countries. We will conclude with a brief review of these three countries.

Iran was described lately as some kind of "future China" (Thaker, 2016). The mobile subscription rate was over 150 per cent as of 2017, 62 per cent of households had access to the internet (the biggest internet user population in the Middle East), 33 per cent were accessing though their mobiles and with one of the strongest penetrations of smartphones in Middle East (Iranian video game industry, 2016), Iran has over half of its population (around 40 million people) owning smartphones (ITU, 2017). As of 2017, Iran was the second largest video game market behind Saudi Arabia (Newzoo, 2017a). 23

million gamers play at least one hour per week, using their smartphones for 77 per cent of players. The average age of players is 21 years (67 per cent of this population being males and the remaining 33 per cent females) in a country with one of the largest youth populations in the region (Tehran Game Convention, 2018). The country considers itself as "the beating heart of the game industry in the Middle East", and it is a major axis for the development of ICTs in Iran. Accordingly, the government, in 2015, launched a plan to support the industry (National Plan for Computer Games in 2015), stressing as well Persian cultural values.

In Turkey, the mobile subscription rate hovered around 100 per cent as of 2017, and the penetration rate of smartphones was 71 per cent (GSMA, 2017c), 76 per cent of households had access to the internet and 67 per cent to the mobile internet (ITU, 2017b). Turkey is the 18th largest games market in the world, but in spite of an accelerated growth over the last years, its 30.8 million gamers are still spending a modest amount, generating only$773.9 million[52] in 2017 (Newzoo, 2017b). Among mobile gamers, 44 per cent are female, with women aged between 21-35 accounting for 20 per cent of the whole group. Again, the industry started growing when developers seized the opportunities opened up by smartphones. The Turkish media ecosystem is fairly developed, Turkey being a great producer of TV series, ranking second behind the US for the production of films for TV. One of the early games of the new millennium was an adaptation of a famous TV series *Asmalı Konak* (*The Mansion with Vines*, 2003; Vaquier, 2013). As with the other countries we reviewed, many of the games use national figures and local cultural features; even games for the international market incorporate Turkish heroes[53].

We find the same virtuous circle, as described, for the two countries. However, Brazil provides us with a counter-example. Although most of the parameters are present (mobile and smartphone penetration, weight of the big cities where 80 per cent of the population is living, youth of the population, a game industry ranking 11th globally [...]) and even with a fairly developed media ecosystem, the recipe does not seem to work. The case may need further investigation, but suffice to say that this is in line with the acknowledged weaknesses of the Brazilian ICT ecosystem (Simon, 2011). To simplify, the Brazilian business environment is not business friendly. Out of 190 countries, the World Bank ranks Brazil, 123rd for the ease of doing business and 175th for the ease of starting a business (World Bank, 2017, p. 195). One can note the lack of any major national players and the incoherence of public policies. The weakness of public policies can disallow an entire set of otherwise favorable conditions, Brazil is a warning case.

## Notes

1. With the exception of the book edited by Wolf in 2015.

2. The ICT sector, according to the 2007 OECD definition, comprises ICT manufacturing industries, the manufacture of magnetic and optical, ICT total services and ICT services industries (that includes software publishing and telecommunications). See OECD Information Economy–Sector definitions based on the International Standard Industry Classification (ISIC 4) www.oecd.org/science/scienceandtechnologypolicy/38217340.pdf

3. This overstatement of the number of actual people is mostly owing to multiple SIM ownership.

4. Annual consumer survey across 56 countries worldwide, representing 80 per cent of the global population; the sample size included 1,000 respondents per country.

5. Revenue rankings are based on revenues earned from paid downloads and in-app purchases on the iOS App Store and Google Play Store. They do not include revenue earned from in-app advertising or subscriptions outside app store channels. *Source*: AppAnnie (2017a).

6. On the basis of a summer and fall 2016 survey, using a sample of 25,229 "invitation-only" respondents; per country, there were between 1,250 and 1,500 respondents.

7. Defined by Newzoo as anyone who has played games on a mobile, PC or console device in the past six months.

8. First generation, 26-35, second generation, 18-25.

9. Loosely defined as the group with a household income between INR 20,000 and INR 100,000 (275/1,377 euros); 1 INR = 0.0137750 EUR as of January 2017.

10 VC firms raise funds from their own investors and purchase equity stakes in early stages (seed, start-up and expansion stage), high-risk and high-growth potential firms.

11. Population (millions) 1,376 GDP (US$billions) 10,982.8 GDP per capita, PPP$. 14,107.4; *World Factbook* 2017.

12. http://worldpopulationreview.com/countries/china-population/

13. China Internet Network Information Center (CNNIC) is the administrative agency of the Ministry of Industry and Information Industry responsible for China's internet affairs. The 2018 report, released in January 2018, is not available in English for the moment.

14. The performance metric measures overall start-up valuations, exits and early- and growth-stage success.

15. For a more comprehensive presentation see Simon (2015).

16. Since the reform of 1998, the State Administration of Radio, Film and Television (SARFT) has control over to the three national media outlets: China Central Television Station, The Central People's Broadcasting Station and China International Broadcasting Station. For reforms of the Chinese audio-visual system see Chun Liu (2010, pp. 15-18).

17. *Source*: www.thestreet.com/story/13678637/1/tencent-surges-becomes-china-s-most-valuable-tech-company.html?puc=bloomberg&cm_ven=BLOOMBERG

18. "China banned game consoles in 2000 allegedly to protect the youth from the corrupting influences of video games" (Newzoo, 2014d, p. 28).

19. Baidu.com is the largest Chinese website and the fifth website globally.

20. Web-based games are games that players can easily access and play via the Web without downloading and installing any software.

21. Massively multiplayer online role-playing game.

22. First person shooter.

23. From the South Korean company, SmileGate, one of the most successful players in the Korean online gaming industry; *Crossfire* is the world's highest grossing online game, with revenues of over US$1 billion in 2012 and 2013. The revenues are mostly from micro-transactions. www.techinasia.com/korea-smilegate-buys-112-million-stake-in-sundaytoz/ The game, owned by SmileGate, is published by Tencent.

24. A fantasy game developed by Korea's NCSoft, released in 2012 in Korea and launched in 2013 in China.

25. Localization: altering a product so it suits a specific country or region (Thayer, 2005).

26. Multiplayer online battle arena.

27. *Augmented reality* is a view of the real world environment whose elements are supplemented and enhanced by computer-generated sensory input such as sound, video or graphics. *Virtual reality* is an immersive multimedia or computer simulated environment which allows interacting with it.

28. Population (millions) 1,311.1; GDP (US$billions) 2,090.7; GDP per capita, PPP$6,161.6, *World Factbook* (2017).

29. 138 euros

30. Massively Multiplayer Online Games.

31. Nasscom Games Forum acknowledges the impossibility of providing a comprehensive view and relies on survey among its members.

32. On the basis of two surveys, fall 2116: gamers 1,336 people, developers 222 people.

33. See the map in OECD (2010).

34. 80 per cent according to the previous Gamesbond survey.

35. Title borrowed from Reddit, 2015. "Repka" (turnip), is an arcade machine tucked in the corner of Moscow's Museum of Soviet Arcades, which might be one of the USSR's oddest games. In it,

would-be worker peasants must test their pulling strength by tugging on a turnip that, legend has it, took the might of three communist villagers to extract.

36. Population (millions) 143.4; GDP $1.268 trillion (2015 est.); GDP – real growth rate: −0.8 per cent (2016 est.) −3.7 per cent (2015 est.) 0.7 per cent (2014 est.); GDP per capita (PPP) $26,100 (2016 est.), *World Factbook* (2017).

37. Includes IT services, software, and hardware (PC, smartphones, telecom equipment, and other hardware).

38. This figure includes not only companies but also individuals who operate without formation of legal entity.

39. 1 RUB = 0.0161944 EUR; 1 EUR = 61.7497 RUB, last consulted February 2017.

40. But 14 per cent in $ due to the rate exchange, and the rubble's depreciation.

41. According to Alexander Kuzmenko, head of Games Mail.Ru, "The importance of Tetris for the gaming industry is hard to overestimate – in fact, the release of this game for Game Boy handheld consoles kick-started the advent of 'pocket games', which in the age of Angry Birds and the like are known as mobile games". Quoted by Govorún (2015).It was also one of the first "casual game". See: http://tetris.com/about-tetris/timeline/

42. Some claims the IBM Simon was the first to include a game called "Scramble" but launched that same year, 1994, by BellSouth. The device was as successful as the Hagenuk MT-2000, and IBM left that market early the following year. www.bloomberg.com/news/articles/2012-06-29/before-iphone-and-android-came-simon-the-first-smartphone

43. The Hagenuk MT-2000 is a Danish mobile phone, three years before the introduction of "Snake" on the Nokia 6110. Hagenuk was one of the first developers of digital mobile games in the industry. The company was sold in 1995: www.hagenuk-germany.de/en/history.html

44. Russia passed a law in 2013 aimed to protect IP rights. Federal law of July 2, 2013, #187-FZ, "On amending certain legislative acts on intellectual rights protection in information and telecommunication networks"; see on piracy "The Piracy Issue", Online video in Russia, pp. 41-50 (East-West Digital News, 2013).

45. Such features and items include virtual gifts, stickers, revenue sharing with developers, revenue from social games and revenue from dating services.

46. No data found on the distribution of value between segments.

47. The Steam platform is considered the largest digital distribution platform for PC gaming. The platform was developed by Valve Corporation (US).

48. For a broader description of the kind of games, see Simon (2016c).

49. As of 2014, 70 per cent of Russian citizens polled said they did not know any foreign language (Terekhin, 2016). Tripapina (myTarget, Mail.ru Group, 2017) gives 7 per cent for the English speaking population.

50. Video games produced and distributed by a mid-sized or major publisher, typically having higher development and marketing budgets. This is equivalent to "blockbuster" in the film industry.

51. Wargaming is involved in the preservation of military history.

52. Statista gives a much lower amount, $299 million, but does not take into account revenues from FtoP.

53. For a history of the Turkish game industry, see Tuker *et al.* (2015).

## References

Benghozi, P.J. and Chantepie, P. (2017), *Jeux Vidéo: l'industrie Culturelle du XXI Ième Siècle?*, Presses de Sciences Po/Ministère de la Culture, Paris.

Chwen, J. (2005), "Digital games localization model and a case study in China", available at: www.google.es/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&ved=0CCUQFjAA&url=http%3A%2F%2Fwww.markdangerchen.net%2Fpubs%2FGame_Slides_final3.ppt&ei=9JYmVb3dCeXC7gaVyYDwDw&usg=AFQjCNGosU_gbNXOt9LjbLpZIFX7oNkMbQ&bvm=bv.90237346,d.ZGU&cad=rjt

Chwen, J. (2015), "Digital games localization model and a case study in China", available at: www.google.es/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&ved=0CCUQFjAA&url=http%3A%2F%2Fwww.markdangerchen.net%2Fpubs%2FGame_Slides_final3.ppt&ei=9JYmVb3dCeXC7gaVyYDwDw&usg=AFQjCNGosU_gbNXOt9LjbLpZIFX7oNkMbQ&bvm=bv.90237346,d.ZGU&cad=rjt

Custer, C. (2016), "How Tencent is taking over global gaming", available at: www.techinasia.com/tencent-gaming-world?ids=311385&ids=344669&ids=334214&model=1&order=3

De Prato, G., Feijoo, C. and Simon, J.P. (2014a), "Innovations in the video game industry: changing global markets", *Communications & Strategies*, No. 94, 2nd Quarter 2014, pp. 17-38.

De Prato, G., Sanz, E. and Simon, J.P. (2014b), *Digital Media Worlds, The New Media Economy*, Palgrave Mc Milan, Houndmills Basingstock.

Fedorov, A. (2015), "Russia", in Wolf, M.J.P. (Ed.), *Video Games around the World*, The MIT Press, Cambridge, MA, London, pp. 439-449, available at: www.researchgate.net/publication/279865999_Fedorov_A_2015_Russia_In_Wolf_MJP_ed_Video_Games_Around_the_World_Cambridge_Massachusetts_London_The_MIT_Press_pp439-449

IMF (2017), available at: www.imf.org/en/News/Articles/2017/02/21/NA022217-For-India-strong-growth-persists-despite-new-challenges#

Juul, J. (2012), *A Casual Revolution: Reinventing Video Games and Their Players*, The MIT Press, Cambridge.

Kerr, A. (2006), *The Business and Culture of Digital Games, Gamework and Gameplay*, Sage, London.

Kerr, A. (2017), *Global Games: Production, Circulation and Policy in the Networked Era*, Routledge, New York, NY.

Kshetri, N. (2013), "The evolution of the Chinese online gaming industry", available at: www.google.es/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=4&ved=0CDIQFjAD&url=http%3A%2F%2Fwww.researchgate.net%2Fprofile%2FNir_Kshetri%2Fpublication%2F228319290_The_Evolution_of_the_Chinese_Online_Gaming_Industry%2Flinks%2F09e41510a5f1069302000000.pdf&ei=rZUiVZbWKYbZarbCgbAG&usg=AFQjCNEa4u2EvOVRBTqiLY74i1FkogC5kA&bvm=bv.89947451,d.d2s&cad=rjt

Liu, C. (2010), "Mapping the future of China's converging telecommunications regulatory regime: a layered prospective?", available at: www.cprsouth.org/wp-content/uploads/2010/12/Layered-Model-CPR_Chun-Liu.pdf

Newzoo (2017c), "Game revenues of top 25 public companies up 17% in 2016, top 10 take more than half of global market", available at: https://newzoo.com/insights/articles/game-revenues-of-top-25-public-companies-up-17-in-2016/?utm_campaign=Games&utm_source=email

Simon, J.P. (2011), "The ICT landscape in BRICS countries: Brazil", *Communications & Strategies*, No. 83, pp. 121-130.

Simon, J.P. (2015), "Video games industry in China and cross cultural gaming", available at: www.inaglobal.fr/en/jeu-video/article/video-games-industry-china-and-cross-cultural-gaming-8446

Simon, J.P. (2016a), "Catching a rising star. techno-platforms study of companies with high market capitalisation (HICAP) running global digital platforms", available at: https://ec.europa.eu/jrc/en/publication/how-catch-unicorn-exploration-universe-tech-companies-high-market-capitalisation?search https://ec.europa.eu/jrc/en/publication/how-catch-unicorn-case-studies?search

Simon, J.P. (2016c), "De Tetris à world of tanks: le Marché du jeu vidéo en Russie", available at: www.inaglobal.fr/jeu-video/article/de-tetris-world-tanks-le-marche-du-jeu-video-en-russie-8952?tq=8

Simon, J.P. (2016d), "User generated content. users, community of users and firms: toward new sources of co-innovation?", *Info*, Vol. 18 No. 6, pp. 4-25, available at: http://dx.doi.org/10.1108/info-04-2016-0015

Simon, J.P. (2017b), "Le don l'autre modèle économique des apps de streaming asiatiques", INA Global, available at: www.inaglobal.fr/numerique/article/le-don-l-autre-modele-economique-des-apps-de-streaming-asiatiques-9927

Thayer, A. (2005), "An overview of digital games, globalization & localization", available at: www.google.es/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&ved=0CCUQFjAA&url=http%3A%2F%2Fwww.markdangerchen.net%2Fpubs%2FGame_Slides_final3.ppt&ei=9JYmVb3dCeXC7gaVyYDwDw&usg=AFQjCNGosU_gbNXOt9LjbLpZlFX7oNkMbQ&bvm=bv.90237346,d.ZGU&cad=rjt

Tuker, C., Yilmaz, E. and Cagiltay, K. (2015), in Wolf, M.J.P. (Ed.), *Video Games around the World*, MIT Press, pp. 565-578.

Vaquier, N. (2013), "Bientôt la consécration pour les séries turques", available at: www.inaglobal.fr/television/article/bientot-la-consecration-pour-les-series-turques?tq=1

Wi, J.H. (2009), *Innovation and Strategy of Online Games*, Imperial College Press, London.

Xsolla (2014), available at: https://xsolla.com/about

Zackariasson, P. and Wilson, T.L. (2012), *The Video Game Industry, Formation, Present State and Future*, Routledge, London/New York, NY.

## Further reading

Curwen, P. (2017), "Reliance Jio forces the Indian mobile market to restructure: a regular column on the information industries", *Digital Policy, Regulation and Governance*, Vol. 20 No. 1, pp. 99-102, available at: https://doi.org/10.1108/DPRG-07-2017-0043

Simon, J.P. (2016b), "How Europe missed the mobile wave", *Info*, Vol. 18 No. 4, pp. 12-32.

Simon, J.P. (2017a), "Le marché de jeux vidéo en inde", INA Global, available at: www.inaglobal.fr/jeu-video/article/bollywood-et-le-cricket-les-fers-de-lance-du-jeu-video-indien-9825

Makarov, V., Schandera, S. and Simon, J.P. (2013), "The ICT landscape in BRICS countries: 5 Russia", *Communications & Strategies*, No. 87, pp. 157-165.

Wolf, M.J.P. (Ed.) (2015), *Video Games around the World*, The MIT Press, Cambridge, MA, London.

## Consultancies, trade press and reports

App Store Stats Summary (2017), available at: www.pocketgamer.biz/metrics/app-store/

AppAnnie (2015), "Russia's mobile app economy a new app superpower in the making?", available at: http://files.appannie.com.s3.amazonaws.com/reports/Russias-Mobile-App-Economy-EN.pdf

AppAnnie (2016), "Russia, CIS and Baltic publishers outpace the global gaming market", available at: www.appannie.com/insights/mobile-gaming/russia-cis-baltic-region-spotlight-outpacing-global-gaming-market/

AppAnnie (2017a), *App Annie 2016 Retrospective*, (January 2017), available at: http://files.appannie.com.s3.amazonaws.com/reports/1701_Report_2016_Retrospective_EN.pdf?mkt_tok=eyJpIjoiT1RJeU16VXhOaIJpTm1KbSIsInQiOiJoOHY1am80cVpaQWM3bm41andzYjhoRUY4dFJLZTF3YlJ1a3UzSXRObHhuRm5DZEhMN3BcLzM3NzZHYWMyUXRtMzVxbWpFdUoxY2t6S1g2eXkyKzdJaXBlM0FpTmxSZFFWWOUZDV3BXK2E0ZVUwYUNCNHUzd1JHWlE5Tm81cmdTbTUifQ%3D%3D

AppAnnie (2017b), "Self-Publishing in Asia: insights from playrix", available at: www.appannie.com/en/insights/mobile-gaming/self-publishing-asia-insights-playrix/?utm_source=appannie&utm_campaign=emea-adhoc-2017-weeklydigest&utm_medium=email&utm_term=20170403-POS3&sfdcid=7016F000001IXgy&mkt_tok=eyJpIjoiTlRKbU5UZGhabUpsTVRjeCISInQiOiI4dnF0aWRzWXppWGF2a1hZd0tlNkUrakhKZ3hObCt3UklXaUURMMFkxbFFFodTJBRTlkRWRMMMTFONFRhNWVSaEhMbnlrNUk5WGlRKzJ5ZytJT0dpZCtBUnVQUjhsdXXVmenhhRmhcL1ZUMlJsQmpxTHhpcL1REUm52XC93OE9lUUk1dUxiZSJ9

AppAnnie (2017c), *App Annie 2016 Retrospective* (updated March 2017), available at: http://files.appannie.com.s3.amazonaws.com/reports/1701_Report_2016_Retrospective_EN.pdf?mkt_tok=eyJpIjoiT1RJeU16VXhOaIJpTm1KbSIsInQiOiJoOHY1am80cVpaQWM3bm41andzYjhoRUY4dFJLZTF3YlJ1a3UzSXRObHhuRm5DZEhMN3BcLzM3NzZHYWMyUXRtMzVxbWpFdUoxY2t6S1g2eXkyKzdJaXBlV00wNEhcL3dtMFo3cE90SklpWUppQXZZZVJJcnF1S2NDT1NVZE90b2lHln0%3D

AppAnnie-Nasscom Gaming Forum (2016), *Mobile Gaming on the Rise in India. Market Intensifies as Gamer Population Surges*, available at: www.nasscom.in/node/1645196

Bischoff, P. (2015), "Asia dominates gaming IPOs, set to earn $45B annual revenue by 2018: report", available at: www.techinasia.com/asia-dominates-gaming-ipos-set-earn-45b-annual-revenue-2018-report/

Cartesian-GSMA (2017), *The future of mobile video*, available at: http://mobileworldlive.com/wp-content/uploads/2017/02/19345%20Mobile%20Video%20Survey%20Report.pdf

Chakraberty, S. (2017), "India now has 462 million internet users – 79% of traffic is mobile", available at: www.techinasia.com/india-462-million-internet-users-79-traffic-mobile

China Tech Insights (2017), "Tencent becomes the first Chinese tech firm valued over US$500B", (accessed 21-27 November 2017).

CIA (2017), *World Factbook*, available at: www.cia.gov/library/publications/the-world-factbook/geos/in.html

CMS China (2018), "CNNIC publishes the 41st statistical report on China's internet development in China", available at: www.lexology.com/library/detail.aspx?g=911ae57f-50da-4c53-ab75-2376272b2021

Deloitte (2016a), "Media and entertainment industry", *India tax landscape*, June 2016, available at: www2.deloitte.com/in/en/pages/tax/articles/media-entertainment-india-tax-landscape.html

East-West Digital News (2016), *Russian games market reached nearly $1 billion in 2015*, available at: www.ewdn.com/2016/07/11/reports-russian-games-market-reached-nearly-1-billion-in-2015/

East-West Digital News (2017), "E-commerce in Russia. what international merchants, service providers and entrepreneurs must know to succeed in a fast-changing market", available at: www.ewdn.com/files/ecom-rus-download.pdf

EY (2014), "Venture capital insights 2013 year-end. global VC landscape, angel and incubator participation trends and exit landscape", available at: www.ey.com/Publication/vwLUAssets/EY-venture-capital-insights-2013-year-end/$FILE/EY-venture-capital-insights-2013-year-end.pdf

EY (2015), *Venture Capital Insights. 4Q14. Global VC investment landscape*, available at: www.ey.com/Publication/vwLUAssets/Venture_Capital_Insights_4Q14_-_January_2015/$FILE/ey-venture-capital-insights-4Q14.pdf

EY (2016), "Back to reality EY global venture Capital trends 2015", available at: www.ey.com/Publication/vwLUAssets/ey-global-venture-capital-trends-2015/$FILE/ey-global-venture-capital-trends-2015.pdf

Gamesbond-Mauj (2016), *Inside India's Gamers*, Whitepaper, available at: www.mobango.com/Inside-Indias-Gamers

GMCC-Newzoo (2017), *The GMGC mobile games* Whitebook, available at: http://resources.newzoo.com/hubfs/Reports/Newzoo_GMGC_Mobile_Games_Report.pdf?utm_medium=email&_hsenc=p2ANqtz–jXY7toNI-eVFauGvPTR4cTRKMi8mLDiqeCoxgPBuV3JrGm4Vd43bOWlp7-Jq2qVRcoaNuu_nn01Hca6Dt5vcuV_S7qg&_hsmi=40528672&utm_content=40528672&utm_source=hs_email&hsCtaTracking=6e93815d-b170-4e55-a35c-6e0f8a2d2435%7C233e0f26-752a-452c-86c6-4447f1226f04

Gokhberg, L. and Roud, V. (2016), "How to design a national innovation system in a time of global innovation networks: a Russian perspective", pp. 159-166, in WIPO/INSEAD/Cornell University, (2016), The Global Innovation Index 2016. *Winning with Global Innovation*. www.globalinnovationindex.org/gii-2016-report

Goodfellow, C. (2014), "Patriot games: a brief history of Russian video gaming", available at: http://calvertjournal.com/articles/show/3395/Russian-video-games-history

Google's consumer barometer (2017a), "China, last consulted February 2017", available at: www.consumerbarometer.com/en/trending/?countryCode=CN&category=TRN-NOFILTER-ALL

Google's consumer barometer (2017b), "India, last consulted February 2017", available at: www.consumerbarometer.com/en/trending/?countryCode=IN&category=TRN-NOFILTER-ALL

Google's consumer barometer (2017c), "Russia, last consulted February 2017", available at: www.consumerbarometer.com/en/trending/?countryCode=RU&category=TRN-NOFILTER-ALL

Govorún, K. (2015), "Simple, original, addictive: how soviet video game Tetris became a classic", *Russia beyond the Headlines*, available at: http://rbth.com/arts/2015/07/18/simple_original_addictive_how_soviet_video_game_tetris_became_a_classic_47855.html

GSMA (2016a), "Global mobile trends", available at: www.gsmaintelligence.com/research/?file=357f1541c77358e61787fac35259dc92&download

GSMA (2017b), *GMEI 2017, Global Mobile Engagement Index*, available at: www.gsmaintelligence.com/research/?file=e4549aeda553ac832ff9126c7d6c0861&download

GSMA (2017c), *The Mobile Economy Middle East and North Africa 2017*, available at: www.gsmaintelligence.com/research/?file=84935f5774975f3d35c8ed9a41b9c1a4&download

GSMA (2018b), "Russian federation", available at: www.gsmaintelligence.com/markets/2901/dashboard/

India Brand Equity Foundation (IBEF) (2016), "India is world's third biggest tech start-up hub: study", available at: www.ibef.org/news/india-is-worlds-third-biggest-tech-startup-hub-study

Internet Live Stats (2017), "Internet users in Russia", available at: www.internetlivestats.com/internet-users/russia/

Iranian video game industry (2016), available at: http://en.ircg.ir/uploads/news/2016/08/071536Book-Iran's%20game%20industry.pdf

iResearch (2017), "The revenue of China's internet economy reached a new height in Q2 2017", available at: www.iresearchchina.com/content/details7_37796.html

ITU (2017), *The ITU Information Society Report and the Development Index 2017*, available at: www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2017.aspx

Kemp, S. (2017a), "We are social/hoot suite", *Global Digital Statshot Q3 2017*, available at: www.slideshare.net/wearesocialsg/global-digital-statshot-q3-2017

Kemp, S. (2017b), "We are social/hoot suite", *Digital in 2017. Global Overview*, available at: www.slideshare.net/wearesocialsg/digital-in-2017-global-overview

KPMG-FICCI (2017), *Indian Media and Entertainment Industry Report 2017*, available at: https://assets.kpmg.com/content/dam/kpmg/in/pdf/2017/03/FICCI-Frames-2017.pdf

Madanapalle, A. (2017), "Indian mobile game developers get worldwide acclaim but face domestic limitations", available at: http://tech.firstpost.com/gaming/indian-mobile-game-developers-get-worldwide-acclaim-but-face-domestic-limitations-358874.html

Nasscom/Google (2015), *The Indian Gaming Market Review: Opportunities in a Rapidly Growing Market*, available at: www.nasscom.in/forum/animation-gaming/research

National Association of Software and Services Companies (Nasscom) (2017), *IT-BPM Industry Snapshot*, available at: www.nasscom.in/indian-itbpo-industry

NetEase (2017), *Annual Report 2017*, available at: http://ir.netease.com/phoenix.zhtml?c=122303&p=irol-reportsannual

Newzoo (2014a), "The Russian mobile games market compared to other major markets", available at: http://newzoo.com/infographics/infographic-the-russian-mobile-games-market-compared-to-other-major-markets/#kpwoLQtAVzIQIHMy.99

Newzoo (2014b), "Introduction to the Chinese games market", available at: www.newzoo.com/download/7955/

Newzoo (2014c), "Introduction to the Russian games market", *Opportunities in in this submerged market: a broader perspective*, available at: http://cdn2.hubspot.net/hubfs/700740/Russian_Games_Market_Report.pdf?t=1455181625601

Newzoo (2014d), *Towards The Global Games Market in 2017. A broad look at market growth by screen & region*.

Newzoo (2015b), *Russian Games Market 2015*, available at: https://newzoo.com/insights/infographics/newzoo-summer-series-7-russian-games-market/#PIEqsQ2QDphsdy9A.99

Newzoo (2016a), *2016 Global Mobile Report, Q4*, available at: http://resources.newzoo.com/hubfs/Reports/NEWZOO_2016_Free_Global_Mobile_Market_Report.pdf?hsCtaTracking=78daf82a-9bb9-47e5-9c87-4807c48ab848%7C4ef757e7-ea01-4398-a45d-78677cdb5aca&utm_medium=email&_hsenc=p2ANqtz-9oQI93N2i8vFNx1HQyiefz4E341TvBPx88Ny6vuCHrsz4vlb7_Bu-d5GBLMroa4-tsBKWIIRUSjwD-GfWSFj1_OsPq5Q&_hsmi=35859677&utm_content=35859677&utm_source=hs_email

Newzoo (2016b), *2016 Global Games Market Report*, available at: http://resources.newzoo.com/hubfs/Reports/Newzoo_Free_2016_Global_Games_Market_Report.pdf?hsCtaTracking=df924a51-0302-4d95-b440-56273fbce61b%7C4b95d366-0ad4-4d6d-b0b5-54e34fd454fb&__hstc=133451409.2aea3b66cc43c6ac5573aeb132ab8417.1481726161113.1489430390816.1489494620124.9&__hssc=133451409.2.1489494620124&__hsfp=2999755184

Newzoo (2016c), *The Russian games market 2016*, available at: https://newzoo.com/insights/infographics/russian-games-market-2016/

Newzoo (2017a), *Global Games Market Report 2017*, available at: http://resources.newzoo.com/hubfs/Reports/Newzoo_Global_Games_Market_Report_2017_Light.pdf?utm_medium=email&_hsenc=p2ANqtz-9hxe_10vObh4r5fXYePlv-e5gB-MXm-X0PLUomek6DkknxXZ2DYDPztoPsKVF0eej5jbtLFvmw2juN67x7xDAhAk9_Tg&_hsmi=53391639&utm_content=53391903&utm_source=hs_email&hsCtaTracking=b1e7ad0f-0367-47fe-af74-d25b087e0247%7C1f97673a-73fc-4014-ac26-8ed0a696bc2a

Newzoo (2017b), *The Turkish Gamer*, available at: https://newzoo.com/insights/infographics/the-turkish-gamer-2017/

Newzoo (2017c), "Game revenues of top 25 public companies up 17% in 2016, top 10 take more than half of global market", available at: https://linkprotect.cudasvc.com/url?a=https%3a%2f%2fnewzoo.com%2finsights%2farticles%2fgame-revenues-of-top-25-public-companies-up-17-in-2016%2f%3futm_campaign%3dGames%26utm_source%3demail&c=E,1,Y2Zwi1HVTp-0wMtvMVavyhAr2jlD5XMnHYL8CFogJJn4BcSEemYdC0R-HOAsEp0TryPPyHeiW7EnmAF1KoOtCvle78k8Atw9VSQI2Wv6rLcsy7Cg&typo=1 and https://newzoo.com/insights/articles/game-revenues-of-top-25-public-companies-up-17-in-2016/?utm_campaign=Games&utm_source=email

Newzoo (2018), *Global Report: US and China Take Half of $113Bn Games Market in 2018*, available at: https://newzoo.com/insights/articles/us-and-china-take-half-of-113bn-games-market-in-2018/

OECD (2010), *The Information and Communication Technology Sector in India: Performance, Growth and Key Challenges*, No 174, OECD Digital Economy Papers from OECD Publishing, Paris, available at: www.oecd-ilibrary.org/docserver/download/5km4k7mf6b41-en.pdf?expires=1486037060&id=id&accname=guest&checksum=E35F5471D4DB081129B27F2E6546AC91

OECD (2011), *OECD Reviews of Innovation Policy: Russian Federation*, available at: www.oecd.org/science/innovationinsciencetechnologyandindustry/oecdreviewsofinnovationpolicyrussianfederation.htm

OECD (2017), *Measuring Tax Support for R&D and Innovation*, available at: www.oecd.org/sti/rd-tax-stats.htm

Pew Internet (2016), *Smartphone Ownership and Internet Usage Continues to Climb in Emerging Economies. But advanced economies still have higher rates of technology use*, available at: www.pewglobal.org/files/2016/02/pew_research_center_global_technology_report_final_february_22__2016.pdf

Phartyyal, S. (2017), *"India's Flipkart looking to raise $1 billion in latest funding round"*, Reuters, available at: http://in.reuters.com/article/us-flipkart-fundraising-idINKBN16F18I

PTI (2016), "Reliance plans to invest in 20 Indian gaming startups", available at: www.bgr.in/news/reliance-plans-to-invest-in-20-indian-gaming-startups/

Reddit (2015), "From turnips to tanks – the changing face of Russian video games", available at: www.redherring.com/software/turnips-tanks-changing-face-russian-video-games/

Reuters Institute (2017), *Digital News Report 2017*, available at: https://reutersinstitute.politics.ox.ac.uk/sites/default/files/Digital%20News%20Report%202017%20web_0.pdf

Rusbase (2013), "2013 – a pivotal year for the Russian venture industry", available at: http://archive.rusbase.com/trending/digest/2013/

Russian Search Marketing (2016), "Russian mobile gaming: stats & downloads", available at: http://russiansearchmarketing.com/russian-mobile-gaming-stats-downloads/

Russoft (2011), *Russian software developing industry and software exports, 8th annual survey*, available at: http://russoft.ru/files/RUSSOFT_Survey_8_en.pdf

Russoft (2016), *Export of Russian Software Development Industry 2015*, available at: http://russoft.org/downloads/RUSSOFT_Survey_12_en.pdf

Shah, A. (2016), "Mobile gaming- survey and insights from India", available at: https://medium.com/@akhilshah/mobile-gaming-survey-and-insights-from-india-7a69cfd2414e#.e8xnvw8px

Sompinmäki, J. (2015), "Comparing gamers from India and the United States", available at: www.techinasia.com/talk/comparing-gamers-india-united-states

Startup Genome (2017), *2017 Global Startup Ecosystem Report,* available at: http://startupgenome.com/thank-you-enjoy-reading/

Statista (2017), "Statistics and facts about the film industry in India", available at: www.statista.com/topics/2140/film-industry-in-india/

Sujatha (2015), "Rise of the Indian Middle class", available at: www.mapsofindia.com/my-india/india/rise-of-the-indian-middle-class

Takahashi, D. (2016), "Playrix has become Europe's quiet giant in mobile gaming", available at: http://venturebeat.com/2016/11/23/playrix-has-become-europes-quiet-giant-in-mobile-gaming/

Tech (2016), "Women play more mobile games than men. Report", available at: http://tech.firstpost.com/news-analysis/women-play-more-mobile-games-than-men-report-307092.html

Tehran Game Convention (2018), available at: www.tehrangamecon.com/en/iran-game-industry

Thaker, P. (2016), "Le monde en 2017. L'Iran en passe d'être la nouvelle Chine", *Courrier International*, available at: www.courrierinternational.com/article/le-monde-en-2017-liran-en-passe-detre-la-nouvelle-chine

Waring, J. (2017a), "China forecast to reach 1B 4G users by end-2017", available at: www.mobileworldlive.com/asia/asia-news/china-forecast-to-reach-1b-4g-users-by-end-2017/?utm_campaign=MWL_AS_20170216&utm_medium=email&utm_source=Eloqua

Waring, J. (2017b), "Alibaba growth fuelled by mobile revenue", available at: www.mobileworldlive.com/asia/asia-news/alibaba-growth-fuelled-by-mobile-revenue/?utm_campaign=MWL_AS_20170126&utm_medium=email&utm_source=Eloqua

Waring, J. (2017c), "Jio, Google developing low-cost 4G smartphone", available at: www.mobileworldlive.com/asia/asia-news/jio-google-developing-low-cost-4g-handset/?utm_campaign=MWL_AS_20170314&utm_medium=email&utm_source=Eloqua

World Bank (2017), available at: www.doingbusiness.org/~/media/WBG/DoingBusiness/Documents/Annual-Reports/English/DB17-Report.pdf

World Intellectual Property Organization (WIPO) (2016), "INSEAD business school and Cornell university", *The Global Innovation Index 2016. Winning with Global Innovation*, available at: www.globalinnovationindex.org/gii-2016-report

## Further reading

AppAnnie-IDC (2017), *Gaming Spotlight, 2016 Review*, available at: http://files.appannie.com.s3.amazonaws.com/reports/1702_Report_2016_IDC_Portable_Gaming_EN.pdf?mkt_tok=eyJpIjoiTVRObVpqTTVaRE5pdW1FeCIsInQiOiJSQ3A4YUpIdE95REhRaFJ6Z2FmaWVVNm9JR2tnOHBBSlNMSDFzSnlcL1MzXC9XYlJJT1BvbUhybId1K25rOVIabzZrdmhTeW0rbmdcLzlFNHRlSkFtOEU0MkNFaHhyaVN1VjjBOdTU1N082dllHTTNHYk5SVWWoxSXhTdXlOMVQwN21lVCJ9

Deloitte (2016b), "Digital: a revolution in the making in India", September 2016, available at: www2.deloitte.com/in/en/pages/technology-media-and-telecommunications/articles/digital-revolution-in-making.html?icid=wn_digital-revolution-in-making

GMCC- Newzoo (2017), *The GMGC mobile games* Whitebook, available at: http://resources.newzoo.com/hubfs/Reports/Newzoo_GMGC_Mobile_Games_Report.pdf?utm_medium=email&_hsenc=p2ANqtz--jXY7toNI-eVFauGvPTR4cTRKMi8mLDiqeCoxgPBuV3JrGm4Vd43bOWIp7-Jq2qVRcoaNuu_nn01Hca6Dt5vcuV_S7qg&_hsmi=40528672&utm_content=40528672&utm_source=hs_email&hsCtaTracking=6e93815d-b170-4e55-a35c-6e0f8a2d2435%7C233e0f26-752a-452c-86c6-4447f1226f04

GSMA (2018a), available at: www.gsmaintelligence.com/

GSMA Intelligence (2017a), *Global Mobile Radar January 2017*, available at: www.gsmaintelligence.com/research/?file=c4e036d381fdf5a62bc9af3c0c1ff730&download

GSMA Intelligence (2016b), "The mobile economy: India 2016", available at: www.gsmaintelligence.com/research/?file=134a1688cdaf49cfc73432e2f52b2dbe&download

Kemp, S. (2017c), "We are social/hoot suite", *2017 Digital Yearbook*, available at: www.slideshare.net/wearesocialsg/2017-digital-yearbook

KPCB (2016), *2016 Internet Trends*, available at: www.kpcb.com/internet-trends

Newzoo (2015a), *Emerging Southeast Asia: Mobile Gaming's New Frontier*, available at: https://s3.amazonaws.com/files.appannie.com/reports/Emerging-Southeast-Asia-Mobile-Gamings-New-Frontier-EN.pdf?mkt_tok=3RkMMJWWfF9wsRokuq7OZKXonjHpfsX67O4rX6G%2BlMI%2F0ER3fOvrPUfGjI4DScRgI%2BSLDwEYGJlv6SgFSrfEMbFl3rgPUxU%3D

Newzoo-CGA (2016), *The Asian Games Market*, available at: https://newzoo.com/insights/trend-reports/asian-games-market-sizing-opportunities/

## Corresponding author

Jean Paul Simon can be contacted at: jpsmultimedia@hotmail.com