

Video Games Production Networks: value capture, power relations and embeddedness

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Abstract

This paper has two main aims. First, to conceptualise the production networks of the video games industry through an examination of its evolution into a multi-million dollar industry. Second, to use the video games industry to demonstrate the utility of Global Production Network approaches to understanding the geographically uneven impacts of processes of globalisation. In particular, three key notions of *value*, *power* and *embeddedness* are used to reveal the most powerful actors in the production network, how they maintain and exercise their power, and how the organisation of production is manipulated as a result. It is argued that while hardware production is organised by console manufacturers using truly global sourcing strategies, the production of software is far more complex. In fact, software production networks are bounded within three major economic regions – Western Europe, North America and Asia Pacific. This paper seeks to explain how and why this has occurred.

1. Introduction

The video games industry¹ was born during the early 1960's and has rapidly, and almost continuously, grown in size and scope ever since. It is estimated that the industry was worth around \$23.2 billion in 2003, and is predicted to reach \$33.4 billion in 2008 (DFC Intelligence, 2004). Despite now being comparable in size to the global film industry, and having a pervasive impact upon popular culture, the video games industry has received relatively little attention from social scientists. With the exception of a few studies, such as Aoyama & Izushi's (2003) discussion of the cultural foundations of the Japanese video games industry and Tobin's (2004) examination of the Pokémon² phenomenon, research into the video games industry has tended to focus upon the psychological impacts of games (Loftus & Loftus, 1983; Kirsh, 2003; McCormick, 2001; see Bensley & Van Eenwyk, 2001 for a review of this literature), concerned with debating whether video games encourage aggressive behaviour in children. Other publications include more journalistic chronologies of the industry (such as Sheff, 1993; Poole, 2000; Kent, 2001; King, 2002; Demaria & Wilson, 2004), which reflect the growing influence of this particular form of cultural product, and widespread frustration at the lack of academic examination of the industry. Poole (2000: 24) states that:

¹ Throughout this paper, the term 'video games' will be used to describe games played using a console linked to a television or on a hand-held device, rather than PC games (played on a personal computer).

² Pokémon began life as a Nintendo Game Boy game, but between 1996 and 2001 came to dominate children's entertainment consumption across the globe. Pokémon is the most successful computer games ever made, leading to the production of a range of inter-related products such as trading-cards, television programmes and films.

‘videogames are not going to go away. You can’t hide under the stairs. Resistance is futile. Any industry with such a vast amount of money sloshing around in it is by that token alone worthy of investigation’.

Poole’s statement alludes to the prevailing and widely-held view of video games as a niche industry, developing products for a minority group of ‘computer geeks’, denying both the size and cultural impact of the industry. Indeed, there is little academic attention paid to the organisational structure of the video games industry, or its geographies. While some studies have been conducted on particular video game markets (see for example, Cornford, Naylor & Driver, 2000; Tschang, 2003), the interconnections between the firms within and between particular markets that constitute the industry have not been observed or conceptualised.

This paper draws on the burgeoning literature concerned with conceptualising changes in industrial organisation resulting from processes of globalisation, which involve the functional integration of dispersed international activities (Dicken, 1998: 5).

Approaches such as Global Value Chains (GVC) (Gereffi *et al.* 2004) and Global Production Networks (GPN) (Henderson *et al.* 2001) seek to understand how flows of materials and services are organised vertically, horizontally and diagonally in complex and dynamic configurations. This paper uses the three central elements of the GPN framework to examine the video games industry – the notions of *value*, *power* and *embeddedness*.

Drawing upon both secondary data and in-depth interviews conducted with senior company executives in Europe, Eastern Europe and Asia, this paper aims to examine the structure and dynamics of the video games industry. The primary research began with

the identification of a key firm – in this case Sony – to act as the focus of attention. Interviews were conducted with this firm and some major suppliers to allow the video games production network firstly to be conceptualised and secondly to investigate its evolution. The video games industry is highly interconnected as firms in each production stage work with a large number of suppliers in other stages. Therefore, the focus on Sony naturally extended to consideration of other hardware manufactures and software producers.

The paper begins with an outline of the video games industry to highlight the key developments in its evolution whilst emphasising its cyclical nature and dependency upon technological advance. The concluding part of this first section offers a conceptualisation of the video games production network. It will be argued that hardware and software production are interconnected but benefit from separate empirical examination, as hardware production involves the sourcing of particular components by console manufacturers. In contrast, software production involves more complex interactions between a number of key actors, necessitating closer and more intense observation to reveal the function and nature of particular connections. Therefore, the second section discussed hardware production, using empirical observations to examine the global sourcing strategies of the console manufacturers and the shifting geographies of this production.

The third section of this paper examines the production of video games software using the three key conceptual elements of the GPN approach. First, empirical evidence will be used to estimate how and where value is captured in the production network. Second, inherent in the process of value capture is the exercising of power, so the nature

of interconnections between actors will be discussed. It will then be argued that power is directly related to firm size, access to finance and distribution and the geographical extent of a firm's operations. Third, the notion of embeddedness will be used to suggest that the video games industry is more territorially embedded than is generally suggested. In fact, while hardware production is conducted at the global scale, software production tends to operate within three supra-regional contexts.

2. Evolution of the video games industry: towards a conceptualisation

The history of the video games industry begins in 1961 with the creation of the first interactive computer game, *Spacewar* by MIT student Steve Russell. The game performed a diagnostic function and was used to demonstrate the ability and accessibility of computers. By the 1970s games had become established as 'traditional' and legitimate programs (Haddon, 1999). Since then, two trends have emerged. First, the video games industry is highly dependent upon technological innovation, both from within and outside the industry. There is a strong relationship between the video games and electronics industries, with the latter traditionally driving innovation and change in the former³. From 1975 onwards, semiconductor companies (for example, Fairchild and National Semi-Conductor) looked to games machines as an ideal application for their new technology, which had a profound affect upon the production organisation of video games.

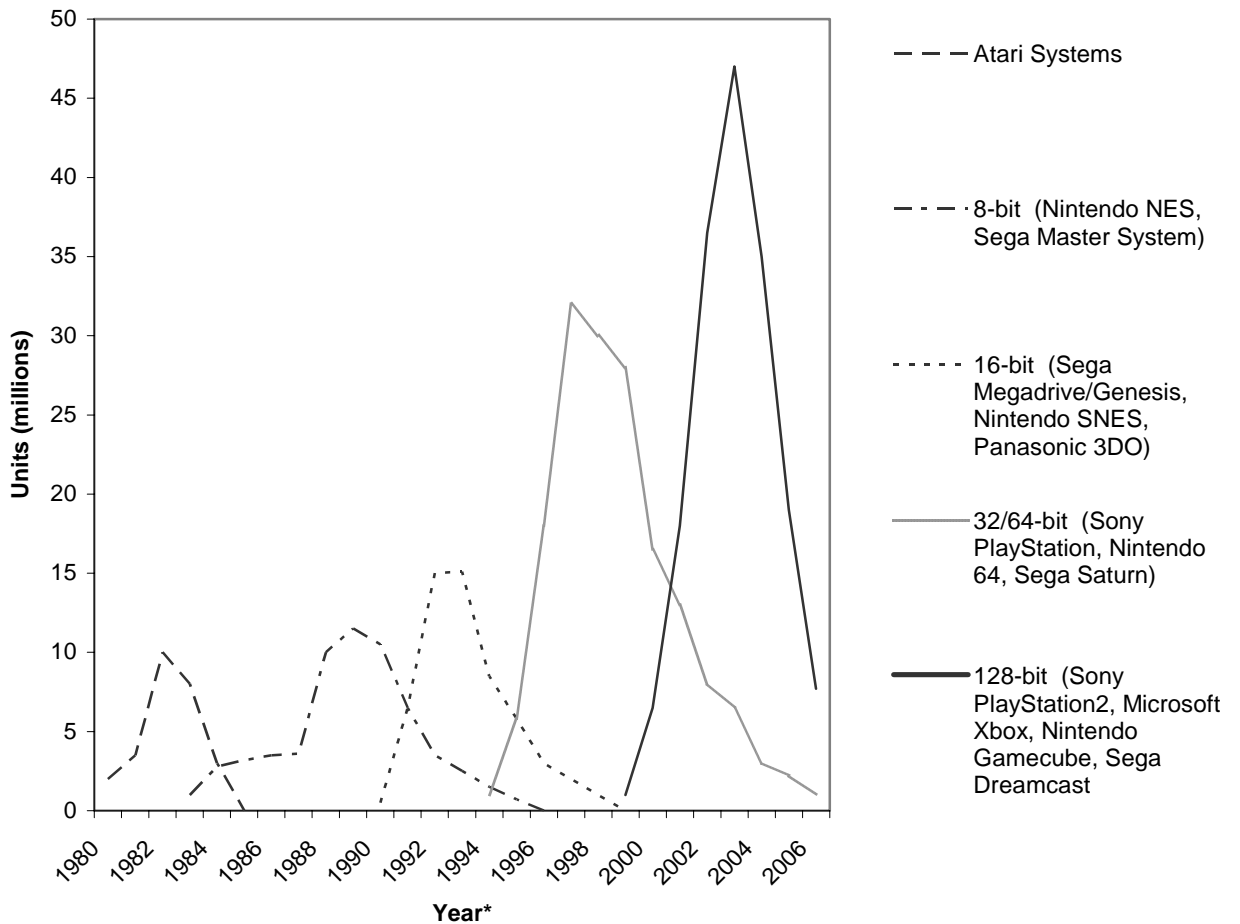
'Programmable machines, or consoles, created a flexible division between hardware and software. Thus, a distinct software industry could emerge once video

³ Over recent years, the video games industry has been driving innovation in product design and production through demand for higher performance and lower costs.

games cartridge manufacturers could sell games separately from the hardware they were played on. Games machines were now potentially “software players” like hi-fis and other home-based “delivery systems”. Games software could be bought, collected and compared in the same way as records’. (Haddon, 1999: 310).

The creation of an interconnected, but autonomous software industry would eventually allow firms to enter the video games production system concentrating upon one particular function, such as game developing or publishing. However, during the earlier stages in its evolution the industry was not big enough to support vertical disintegration. The late 1970s and early 1980s saw a high turnover of firms entering the market, attempting to capture hardware dominance. But competition was intense and many firms went bankrupt. Nevertheless, hardware and software sales remained at high enough levels to support the fewer companies still operating in the market (Haddon, 1999), and the predicted failure of gaming did not occur. Since this time, technological developments, particularly those in the semiconductor industry, have driven the evolution of the video games industry. As a result, the games business goes through a cycle every five to six years, as one generation of consoles succeeds another (see Figure 1).

Second, as Figure 1 shows, as a new generation of consoles emerges, a boom in sales results during which intense competition takes place between the hardware manufacturers, with one producer dominating sales after a relatively short time. In the first cycle, the dominant hardware manufacturer was Atari, with 80% of the home market (Haddon, 1999), later followed by Nintendo’s success during the late 1980s and early 1990s. Of crucial importance to the hardware manufacturers is the supply of



* 2002-2008 predicted figures

Figure 1: Unit sales of game console by type, 1980- 2006
 Source: *The Economist* (2002: Figure 2)

software, which is now provided by developers. These developers tend to take a couple of years to develop new generation software which, when released, intensifies the boom in hardware sales. The decline of Atari⁴ is often blamed on too much poor-quality software being available, which resulted in Nintendo taking tight control over the publishing of software for both the Nintendo Entertainment System (NES) and Super Nintendo Entertainment System (SNES). Nintendo, and later their main rival Sega, both used cartridge technology to prevent copying, as developers were forced to pay the

⁴ The Atari brand still exists and was recently acquired by Infogrames.

hardware producers to manufacture their cartridges. This practice was seen as unfair by the software developers⁵, but Nintendo and Sega were effectively seeking to retain control over the production of software for their consoles, and crucially, to take a proportion of revenue generated by its sale.

Booms in sales of both hardware and software are subsequently followed by lulls, as consumers anticipate the launch of the next generation machines. In the mid 1990s these were the Sony PlayStation, Nintendo 64 and Sega Saturn, offering 32 or 64-bit consoles, and in the case of Sony and Sega using CD-ROM storage. These consoles required new levels of investment, and as a result, higher risk. The intense competition between manufacturers is decided by the consumer based on a number of factors: the price of the console, the availability and quality of software, the quality of graphics and game-play and marketing and peer review. In addition, enormous competitive advantage seems to be gained by being the first of the next generation of console to launch, which has been the case with both the Sony PlayStation and PlayStation2. As with many other cultural industries, demand in the video games industry is difficult to estimate and a highly competitive, volatile and risky environment results which directly impacts upon the structure and evolution of GPNs. Indeed, the industry can be characterised by high levels of firm entry and risk-taking resulting either in market success, and possible domination, or failure and exit from the industry.

The video games industry is unique in nature with a history which accelerates from small firms, maybe even individuals programming software in their bedrooms,

⁵ This practice was investigated by the Monopolies and Mergers Commission in the UK (1995), which concluded that neither firm was acting against the public interest.

producing for a highly niche market, to an industry dominated by multinational hardware producers. Table 1 shows that over 100 million 128-bit consoles and hand-held gaming devices have been sold across the world to date. Video game GPNs have formed and evolved greatly during this time, producing shifting geographies and changing power relationships between actors. In order to understand how these relations are structured and organised over space, it is first necessary to conceptualise the video games production network.

Table 1: Total Estimated Console Sales by Region, 2004 (millions)

Console	Europe/PAL*	Japan	N. America	Total
PlayStation 2 (PS2)	19.40	14.17	19.00	52.57
GameCube (GC)	1.95	2.47	4.60	9.02
Xbox (XBX)	2.20	0.40	5.80	8.40
Total	23.55	17.04	29.40	69.99
Hand-held Console				
GameBoy Advance	7.92	9.24	14.54	31.70
GameBoy Advance SP	0.46	0.82	2.30	3.58
Total Consoles	31.93	27.10	46.24	105.27

* The PAL territories are defined as Europe, the Middle East, Africa, Oceania and parts of Latin America.

The GPN framework argues that a *holistic* perspective be taken on the study of particular industries to counter undue focus upon the production stage *per se*. Here, therefore, the video games industry is divided into seven key stages of production, beginning with financing and ending with consumption (see Figure 2). In addition, the production network can be divided into two interrelated parts; hardware and software production and, although these are complementary, each has distinct organisational structures and geographies. As suggested in Figure 2, hardware production is conducted by console manufacturers who coordinate concept and research development, console production and distribution to the consumer. However, the degree to which these manufacturers complete these tasks in-house and, indeed, the relative importance

of video games to their overall operations varies greatly between firms. The current console manufacturers are Sony (PlayStation 2), Nintendo (GameCube) and Microsoft (Xbox), and each has different global production networks.

3. The global sourcing strategies of console hardware producers

While hardware and software production are inherently interconnected, the production of console hardware takes particular organisational forms and geographies compared to that of software. Figure 3 shows the production networks of the Xbox, GameCube and PlayStation2. It must be noted that not all components are listed for reasons of practicality, for example Microsoft's Xbox contains 29 integrated circuits and 1,248 other components. Each console manufacturer outsources the assembly of hardware to third party manufacturers, but each varies in the degree to which they manufacture their own components, negotiate with particular suppliers or from where they source components. It is clear that each console manufacturer adopts a different organisational strategy based upon divergent corporate histories and cultures. For example, Microsoft has outsourced all console assembly to firstly Flextronics, and more latterly to Wistron, while Sony and Nintendo both conduct considerable assembly in-house (45% and 66% respectively). In addition, Nintendo uses only one assembler, while Sony and Microsoft use two, claiming that this offers greater flexibility and responsiveness to demand. Sony uses Foxconn for 60% of its outsourced production, and Asustek for 40% and both are located in Taiwan.

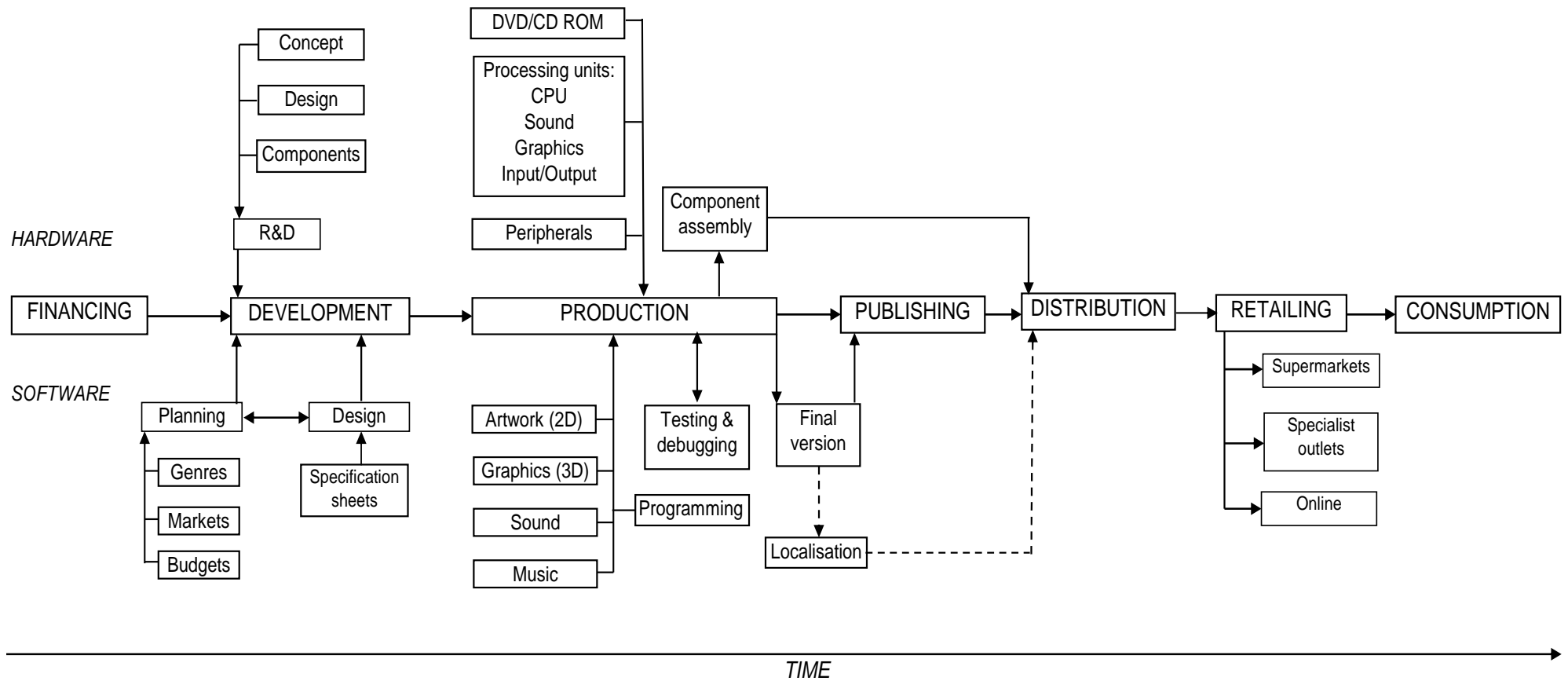


Figure 2: The seven stages and inputs of the video games production network.

Conversely, when production of the Xbox began, Flextronics was manufacturing all Microsoft's consoles in Guadalajara, Mexico (to serve the North American market) and two locations in Hungary (to serve the European and Asian Pacific markets). However, in 2002 Flextronics relocated from Hungary to Doumen, China, claiming that this was more cost effective, as many components were being produced in China and labour was cheaper. At this point, Microsoft called upon long-standing OEM partner Acer, and began using their manufacturing arm, Wistron which produced approximately 1.5 million Xboxes in 2003 (around 20% of total production). Therefore, the introduction of a second console assembler was based upon geographical and temporal contingencies not anticipated by Microsoft.

Indeed, the production network shown Figure 3 is not fixed, as both the network of suppliers shifts and the quantities of production change over time. The degree to which the console manufacturers negotiate with individual suppliers depends upon their relationship and agreement with the assembly firm(s). For example, Flextronics handles inventory issues with suppliers, while Microsoft handles the overall management of around 40 strategic suppliers, including suppliers of microprocessors, flash memory, power supplies, disk drives and graphics chips. Flextronics deals with the sourcing of low cost items such as resistors, capacitors and some semiconductors. This division of responsibility surprised many in the industry as Microsoft previously had little manufacturing experience, and subsequently found it hard to establish good relationships with their suppliers. In comparison, Sony's hardware production network

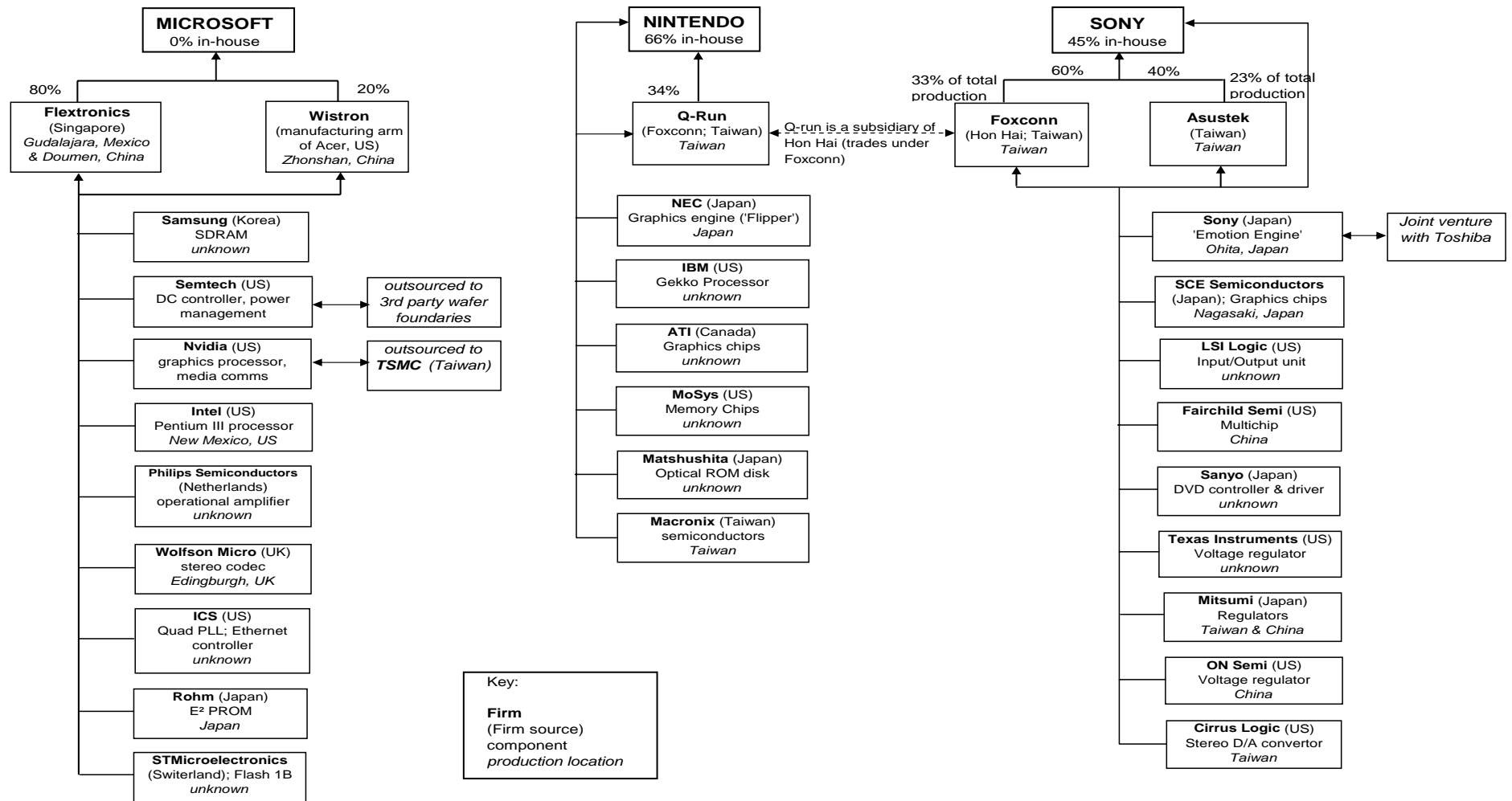


Figure 3: Hardware production networks for Microsoft's Xbox, Nintendo's Gamecube and Sony's PlayStation2.

Source: Company reports and industry sources

is more complex as they supply some of their components and have developed strong relationships with suppliers, many of whom supplied components for the PlayStation. Indeed, as these production networks have only been operational, in these particular forms, since 1999 at the earliest, it has not been possible to observe significant supplier changes (which are closely guarded by the console manufacturers). In addition, these production networks are not necessarily constantly operational as they are highly dependent upon the sale of consoles produced. Both the Xbox and GameCube sold in significantly smaller volumes than predicted and this had an impact upon production. With an inventory clogged with millions of unwanted GameCubes, Nintendo was forced to suspend production for the first nine months of 2003. The impact on production of the Xbox was less significant and became disguised in the more high-profile shift of production from Hungary to China. The hardware production networks outlined in Figure 3 are, by their very nature, temporary as console manufacturers begin to look to the next generation of console, requiring technological advancement, and which may or may not require inputs from existing suppliers.

The geographical distribution of suppliers and their production locations shown in Figure 3 demonstrates that each console manufacturer operates global sourcing strategies, although Microsoft tends to use more North American suppliers. In addition, it is clear that China and Taiwan are important locations for the production of a large number of console components, particularly lower cost items such as voltage regulators and semiconductors. More complex components, such as NEC's graphics engine and Sony's 'emotion engine'⁶ are manufactured in Japan, and Intel's Pentium III processor in the US. Over recent years, Taiwan has emerged as the leading site of console

⁶ The term adopted by Sony and Toshiba for their jointly developed 128-bit processor chip

assembly, and it is estimated that Taiwanese companies made 55% of games consoles sold worldwide in 2003, up from 40% in 2002 (ITIS, 2004). In addition to this console assembly, Taiwan is an increasingly important location for component manufacturing, and a plethora of firms producing console peripherals, such as controllers, memory cards, joy-pads and cables, have emerged both in Taiwan and Shenzhen, China.

As the console manufacturers are operating at a loss to produce hardware, they are keen to find cost savings, leading to global searches for the best value suppliers. These global sourcing strategies have led the top three console manufacturers to Taiwan and China for lower cost components and assembly, while higher value inputs and research and development are retained in home markets. However, while the production of hardware operates globally, a uniform product is not produced. In fact, each console has to be tailored to the region to which it is to be sold, based on the different television screen standards (PAL or NTSC) adopted across the world. This specific technological issue is easily overcome by the use of a specific chip in the console which designates the machine before it leaves the factory. North America and parts of Asia (particularly Japan) use NTSC, while Europe, Africa, Oceania and parts of Latin America all use PAL. This technological divide has resulted in the division of the global video games market into three distinct supra-regional sections – North America, centred on the US; Europe, focussed on the UK and France; and Asia-Pacific, led by Japan – which are reflected in the organisation of all three main console manufacturers. For example, Sony's video games division (Sony Computer Entertainment) is divided into Sony Computer Entertainment Japan (SCEJ), Sony Computer Entertainment Europe (SCEE) and Sony Computer Entertainment America (SCEA). While this issue of territory may

not have a particularly significant impact upon the production of games hardware, it does have an effect on the organisation and geographies of software production.

4. The organisation of creative production: video games software networks

While hardware production networks are based on the supply and assembly of tangible components, software development requires the coordination of tangible and intangible inputs. As greater levels of creativity are required, software production networks are organised differently, with each their own specific geographies. Figure 4 shows the major connections between the key actors in the video games software production network, and distinguishes between the exchange of tangible and intangible goods (such as the transfer of completed code, supplier agreements or knowledge) and capital exchanges.

4.1 Capturing value: accessing finance and distribution

Figure 4 demonstrates that financing for developers is provided by publishers, either from console manufacturers' in-house facilities or from independent publishers. In exchange, the publisher usually retains the intellectual property rights (IPR) to the game, and equally significantly, keeps decision-making powers over the game until it reaches the consumer. Following negotiation, the developer is usually granted a fixed fee or a fixed percentage of sales revenue. Retailers and distributors capture value following the sale of games and again this is negotiated with the publisher (in the case

of the retailer, either directly or conducted by the distributor). Finally, the console

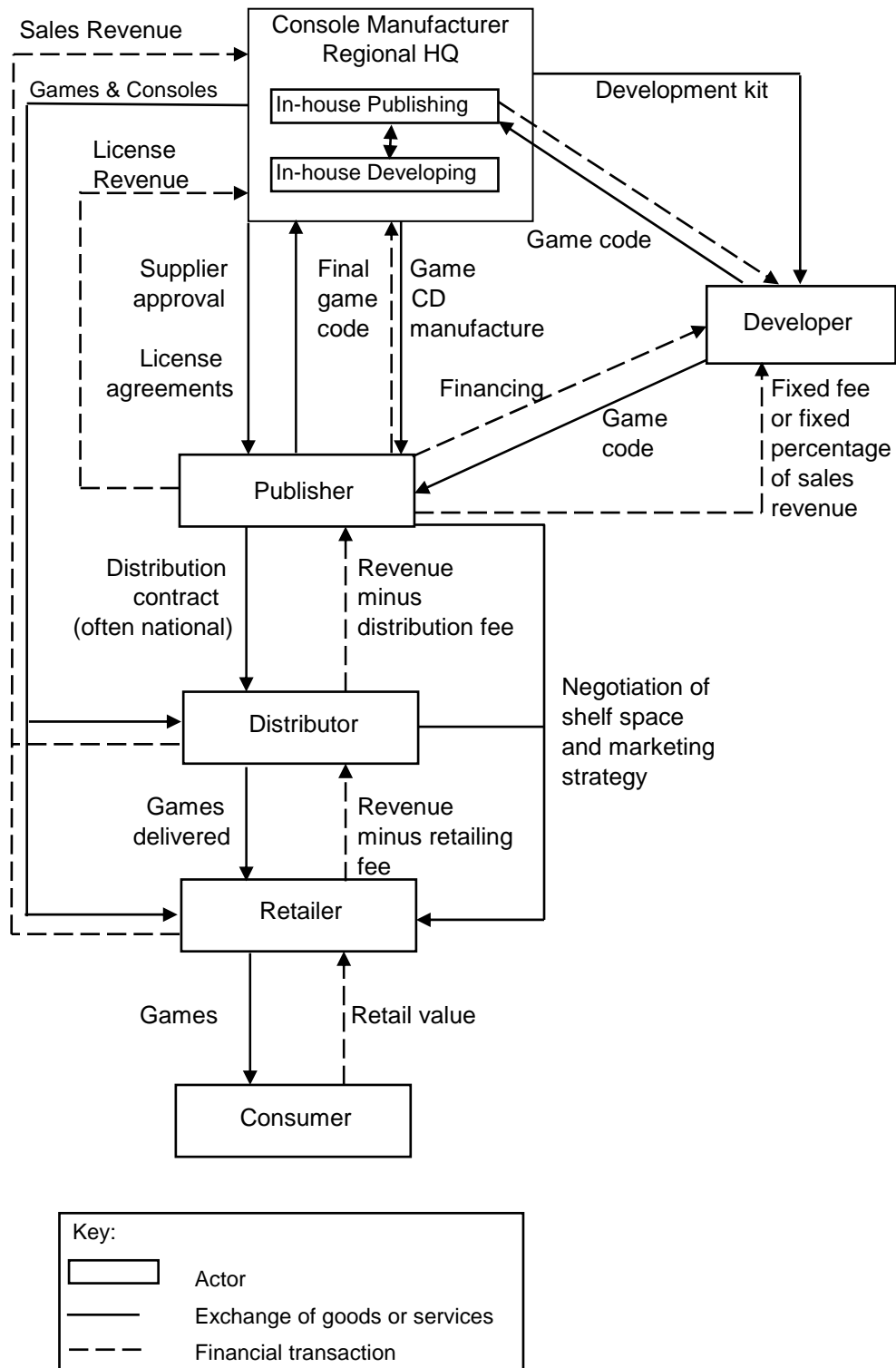


Figure 4: Interconnections between actors in the video games software production network

manufacturer is able to capture a significant proportion of the value of a game through their exclusive manufacture of the game. As discussed above, the console manufacturers realised early in the evolution of the games industry that the sale of software would be far more profitable than that of hardware. Today, games CDs are manufactured by the console manufacturer, enabling a degree of quality control, monitoring of the industry and, most significantly, a percentage of all games sold for their particular console.

‘The bulk of the risk of financing projects is carried by us, the publishers. They don’t manufacture the game until we have paid them and their only other costs are their own internal costs. The actual material cost of producing a game is probably less than €2, so if they are charging us anywhere between €7 and €10, that is really where they are making their money’ (Publisher, March 2002).

Empirical evidence suggests that the manufacturer is able to capture 20% of the total retail value of a console game; developer and publisher (combined), 40%; distributor, 10% and retailer, 30%. These figures are estimates and represent an average distribution of value across the production network as negotiations between actors will vary between games. This approximation of the relative values of each stage of the production process is supported by industry data. For example, in 2001 the UK the retail market (£356 million) was significantly larger than that of distribution, the UK publishing market totalled £337 million, and developing £456 million (DTI, 2002: 20). However, these figures include the UK PC software market in which retailers gain approximately 30% of retail value; distributors, 10% and developers & publishers (combined), 60%. This latter figure is higher than for console games as the console manufacturers are not present in the production network and therefore collect no

royalty. However, despite the higher percentage of revenue that can be generated from producing PC games, many publishers and developers prefer to focus their attention on console game production.

‘We do make PC games, and they are cheaper to produce because you don’t have to pay a royalty to the third party, like Sony or Nintendo. But there are no companies spending money marketing PC sales, like the console manufacturers do, so with the consoles there is better and easier markets to target. Producing console games is more of a lifestyle than with PCs’. (Publisher, March 2002).

Console markets preferred by publishers as they have the complex task of estimating the revenue that will be generated by a particular game *before* it is completed, and before they are willing to invest vast sums of money into its development.

‘The games industry has become like the Hollywood film industry. You are talking budgets of upwards of 5 to maybe 7 million Euros to produce a title. There is a huge, huge expectation on the development team because you have a set of benchmarks, saying that x amount of time, x amount of revenue on this game, so it should generate at least 500,000 sales, and if it doesn’t then you are screwed’. (Console Manufacturer, February 2002).

The relationship between developers and publishers is the most opaque in the video games production network. Combined, the proportion of retail revenue collected by developers and publishers is 40%, although individual figures are very difficult to estimate as specific deals between these actors are rarely publicised. However, the nature of this interaction between the often more creatively concerned developers and the revenue driven publishers reveals a key tension apparent in the video games industry.

‘We are in this industry because we love making games.....our ideas with our people. We don’t want to sell out to some big publisher. We only deal with them because we have to. I know we have to make money to survive, but we want to develop a successful title for other reasons...it means that people share our love of a concept and like our work’ (Developer, June 2002).

Just as value is spread unequally across the software production network, it is highly spatially uneven, with several key nations and cities dominating various stages of the production network. The global market in ‘leisure software’ (which includes PC games), is dominated by three large markets; with the US forming the largest with £4.5 billion in 2000, followed by the European (£4.1 billion) and the Japanese (£2.4 billion) (DTI, 2002:10). These markets are served by key centres of production located across the US, Europe and Japan, following the technological division of the globe into three regions. As Table 2 shows, the 14 largest publishers of console software originate from either the US, Japan or France. This highly uneven distribution of firms also occurs within the development stage of production, although to a lesser degree. The causes of this concentration of activity are related to a number of factors, including the evolution of the industry, the unequal spatial distribution of global capital and more complex notions of cultural embeddedness.

These large games companies have evolved rapidly over time, with a wave of industry consolidation beginning in the early 1990s that had a profound impact upon the industry and saw a dramatic increase in the rate of internationalisation across the production stages. This began as a result of the rapid increase in the size of the industry as the Sony PlayStation and Nintendo 64 were launched (see Figure 1). Again, the search for economies of scale encouraged developers and publishers to merge with, or acquire,

Table 2: Global top 15 video game publishers by earnings (€millions)

Rank	Company	Country	1999	2000	2001	Growth
1	Sony*	Japan	6450.7	6574.6	5610.3	0.9%
2	Nintendo*	Japan	4711.2	5325.8	3926.1	-12.8%
3	Microsoft*	US	1076.2	1759.7	2181.5	20.2%
4	Electronic Arts	US	1145.5	1536.8	1476.4	-6.9%
5	Sega	Japan	697.0	1869.8	982.6	-37.8%
6	Activision	US	409.2	619.3	692.5	8.4%
7	Atari (Infogrames)	France	306.1	521.6	674.3	29.3%
8	Square Soft	Japan	590.6	732.3	641.2	3.6%
9	Take Two Interactive	US	285.7	393.9	503.7	23.9%
10	Konami	Japan	516.4	615.2	502.3	-3.4%
11	Vivendi Universal Publishing	France	265.4	361.0	444.0	23.0%
12	THQ Inc	US	284.5	375.5	423.2	9.2%
13	Capcom	Japan	184.8	359.0	269.3	-11.3%
14	Ubi Soft	France	132.6	186.5	259.8	39.3%
15	Eidos	UK	338.3	313.3	226.1	-26.2%

* Figures for earning generated by publishing cannot be separated from game console production earnings. Microsoft's revenues also include the group's Internet activities, the production of computer accessories and publication of educational software.

Source: Michaud (2002, p. 5-6)

competitors, as average production budgets soared beyond £1 million. Table 3 shows details of selected mergers and acquisitions from 1993 onwards, revealing both the scale of consolidation in this period and an industry-wide trend towards vertical integration.

These data show that the industry consolidation has been dominated by publishers acquiring developers and other publishers in the search for increased power through greater size. Indeed, publishers once tended to operate within national boundaries, but through the acquisition of publishers in other markets, they have expanded in size (see Table 3) and in the extent of their operations.

As the cost of development has increased, publishers wish to increase the proportion of value that they are able to capture by owning more stages of the production process.

Over recent years the numbers of independent developers worldwide has decreased as more development studios are acquired by the console manufacturers or publishers.

Indeed, in 2001 independent development in the UK was worth £219 million, compared to in-house development of £238 million (Screen Digest, 2001). In addition, several independent developers have been acquired since this time. If this trend of consolidation in the industry is placed within the context of the broader hardware cycle, it is apparent that the mergers and acquisitions outlined in Table 3 occurred during the industry's peak.

4.2 Uneven power relations: key actors driving organisational change

Discussion of how and why particular actors are able to capture a certain proportion of the revenue generated from console games sales requires further investigation into the nature of the relationships between actors and how these relations shape the evolution of the production network. How particular firms are able to manipulate the production network to increase their percentage of revenue is a function of their positionality within the network, and an outcome of the power negotiations between themselves and other actors. In the case of the video games industry, clear differences between actors' power in each production stage can be observed that are dramatically altering the structure and geography of the production network over time.

As shown in Figure 4, the console manufacturer performs a number of different functions of the production network in-house, such as publishing and developing its own games. However, all console manufacturers outsource a proportion of their games development, which is handled by a division separate from their own development.

'Essentially, internally we have to make games. That is what makes money. We don't necessarily make that much money on hardware. If you produce software

Table 3: Selected mergers and acquisitions with the video games industry 1993-2004

Year	Acquired	Location	Activity	Acquirer	Location	Activity	Stake
1993	Psygnosis	UK	PD	Sony Corp.	Japan	HW, PD	100%
1995	Rare	UK	PD	Nintendo	Japan	HW, PD	25%
1995	Bullfrog	UK	PD	Electronic Arts	US	PD	100%
1995	Domark	UK	PD	Eidos	UK	PD	100%
1996	Core Design	UK	PD	Eidos	UK	PD	100%
1996	Ocean Software	UK	PD	Infogrames	France	PD	100%
1996	Probe	UK	PD	Acclaim	US	PD	100%
1996	Iguana	UK	PD	Acclaim	US	PD	100%
1996	Atari Games	US	PD	Midway Games	US	PD	100%
1997	DMA	UK	D	Gremlin	UK	PD	100%
1997	Mainstream Interactive	AU	PD	Gremlin	UK	PD	100%
1997	Spidersoft	UK	D	Take 2 Interactive	US	PD	100%
1997	Digital Interaction	UK	D	Titus Interactive	France	PD	100%
1997	Millenium	UK	D	SCEE	UK (JP)	PD	100%
1997	Maxis	US	D	Electronic Arts	US	PD	100%
1997	Centresoft	UK	DR	Activision	US	PD	100%
1997	NBG Distribution	Germany	D	Activision	US	PD	100%
1997	Raven Software	US	D	Activision	US	PD	100%
1998	CD Contact Data	Belgium	DR	Activision	US	PD	100%
1998	Head Game	US	PD	Activision	US	PD	100%
1998	Crystal Dynamics	US	D	Eidos	UK	PD	100%
1998	Rare	UK	PD	Nintendo	Japan	HW, PD	25%
1998	Reflections	UK	D	GT Interactive	US	PD	100%
1998	Westwood Studios ¹	US	D	Electronic Arts	US	PD	100%
1998	Virgin Studio	US	D	Electronic Arts	US	PD	100%
1998	Atari Corp.	US	PD	Hasbro	US	PD	100%
1998	Microprose	US	D	Hasbro	US	PD	100%
1999	Elisnore Multimedia	US	D	Activision	US	PD	100%
1999	Expert Software	US	PD	Activision	US	PD	100%
1999	Neversoft Ent.	US	D	Activision	US	PD	100%
1999	Accolade	US	PD	Infogrames	France	PD	100%
1999	Gremlin Interactive	UK	PD	Infogrames	France	PD	100%
1999	GT Interactive	US	PD	Infogrames	France	PD	100%
1999	Ozisoft	AU	DR	Infogrames	France	PD	62.50%
1999	Beam Software	AU	D	Infogrames	France	PD	100%
1999	Talonsoft	US	D	Take 2 Interactive	US	PD	100%
2000	Dreamworks Interactive	US	D	Electronic Arts	US	PD	100%
2000	Hasbro Interactive	US	PD	Infogrames ²	France	PD	100%
2000	Paradigm Ent.	US	D	Infogrames ²	France	PD	100%
2000	Bungie Software	US	D	Microsoft	France	HW, PD	100%
2000	Verant Interactive	US	D	Sony Corp.	Japan	HW, PD	100%
2000	Volition	US	D	THQ	US	PD	100%
2000	Sinister Games	US	D	Ubisoft	France	PD	100%
2000	Grolier Interactive	UK	D	Ubisoft	France	PD	100%
2000	Red Storm Ent.	US	PD	Ubisoft	France	PD	100%
2001	Treyarch Invention	US	PD	Activision	US	PD	100%
2002	Rare	UK	PD	Microsoft	US	HW, PD	100%
2002	Luxoflux Corp.	US	D	Activision	US	PD	100%
2002	Gray Matter	US	D	Activision	US	PD	100%
2002	Shaba Games	US	D	Activision	US	PD	100%
2002	Z-Axis	US	D	Activision	US	PD	100%
2002	Eden Studios	France	D	Infogrames	France	PD	100%
2002	Shiny Ent.	US	D	Infogrames	France	PD	100%
2002	Massive Ent.	Sweden	D	Vivendi Universal	France	PD	100%
2003	TDK Mediactive	US	PD	Take 2 Interactive	US	PD	100%
2004	Tiwak	France	D	Ubisoft	France	PD	100%

¹ Westwood Studios closed in March 2003 - all willing staff were absorbed into EA's LA studio

² Infogrames Inc. renamed Atari Inc. in 2003

Key: HW = Hardware; D = Developer; DR = Distributor; PD = Publisher-Developer

Source: Adapted from Cornford & Naylor (2001; Table 2) and original research.

yourself, the money goes straight into your pocket and the first party software generates the most revenue'. (Console Manufacturer, February 2002).

Each console manufacturer is keen to have successful titles produced for their consoles and seek to obtain such titles from reputable third-party publishers. As discussed above, the console manufacturers are able to capture up to a third of the retail value of a game, generating significant profits. However, the console manufacturers use this licensing process to perform arbitrary quality control, and if they wish are able to reject games. This represents the source of the console manufacturer's direct power over publishers, as they use only approved publishers that have been formally vetted, creating an inner circle of preferred suppliers.

'Our contact with the console manufacturers tends to be about technical issues...but Microsoft have to give concept approval as well, which is unusual. The relationship is a bit dictatorial, even though we are part of the club...because we are registered publishers we are invited to conferences to tell you how they are doing, the changes they are making, procedures, stuff like that. The formal relationship associated with getting a game out starts with pre-submission of the code which is an informal look at what we are going and where we might be going wrong, etc. Then you go to formal submission, and if the code passes, it goes straight to the manufacturer, and we don't see it again and are not allowed to interfere with it between submission and manufacture' (Publisher, March 2002).

Through the control of manufacturing games, the console manufacturers are able to maintain a powerful grip on the activities of firms in the development and publishing stages of the production network. As the console manufacturers have a vested interest in producing high quality games for their products, they are often willing to offer

generous funding to developers with promising concepts. As a result, developers are often keen to work directly with console manufacturers rather than independent publishers, but due to high competition for financial backing, most developers are unable to select the publisher they work with. In essence, developers are charged with the creative development of a game code, which is then passed over to the publisher who oversees the rest of the production network. As Figure 4 suggests, developers are relatively isolated in terms of network connectivity, occupying a peripheral position than the console manufacturers and publishers. Consequently, they are often in a weak negotiating position and are unable to capture extra value. In addition, the publisher often retains the intellectual property rights to games, despite the initial concept and creative input originating with the developer.

‘We do this because we love it...not necessarily for financial reward. That rarely happens...if anyone is going to make money it is the publishers. And to make matters worse, *they* keep the rights to *our* ideas. It’s not right but we can’t do anything about it’ (Developer, July 2002).

However, while developers are often the weaker partner in negotiation with publishers and console manufacturers, this is not always the case. Two factors can greatly increase the power of developers; the *reputation* or history of the firms, or individuals employed by the firm, and the temporal position of negotiations within the broader cycle of the console market (shown in Figure 1).

Console manufacturers have a preferred list of developers to supply game code, based upon the track record of the development team. Here, factors such as the creative reputation of certain individuals for conceiving and developing popular titles, the genre of games produced and the particular concept being presented all play a role in the

console manufacturer's selection process. In essence, the developer is attempting to trade their unique creative skills which are, by their very nature, unquantifiable. The potential of a particular concept is an unknown until it is produced and reaches the consumer. As the publisher assumes the majority of the risk by financing the development of an idea, they have to negotiate the best deal in order to gain maximum revenue from successful titles. Therefore, publishers often seek developers with strong reputations for success and, as a result, these particular firms are placed in a more powerful position as trust and confidence assume extra significance in negotiating financing deals.

'Because we've established a strong reputation for producing successfully games, we can negotiate better deals with the publishers. We have good relations with one publisher in particular, and we know that they aren't going to screw us. Publishers are desperate for good games and we are confident about providing them'

(Developer, June 2002).

In addition, publishers are increasingly purchasing the licenses to produce game versions of other cultural products such as films or sports, or financing sequels to successful games, as the perceived risk on the investment is lower. Therefore, developers that have produced one successful title have greater negotiating power, especially if a publisher commissions them to develop a sequel to that game (although the publisher retains the intellectual property rights in the majority of cases).

When examining the power relations in the production network, it is essential to consider broader temporal dimensions, given the cyclical nature of the industry. As Figure 5 shows, the bargaining power of games developers varies greatly depending on the position of the console manufacturer, and as suggested above, upon the particular

developer's reputation. The empirical data for this paper were collected in 2001 and 2002, during which time Sony's PlayStation2 (PS2) had obtained a significant competitive advantage from launching before its competitors. The PS2 sold rapidly, due in part to the availability of 17 games at launch (of which 13 were third-party titles). At the end of July 2003 the number of software titles had reached 629 (of which 547 were third-party titles). Publishers and developers were encouraged to produce for the PS2 as the hardware installation figures grew, equating to potentially higher revenues. This also serves to highlight the interdependence between hardware and software production, as hardware sales increased in turn as more games were available.

'At the moment, the easiest and safest one to publish on is PlayStation2 as it has been out a bit longer than its competitors, so those are a bit of an unknown quantity. Last year we lead mainly on the PS2, but if we know we have a successful title we will do it on all the formats. We use PS2 to test the water'.
(Publisher, June 2002).

'Sony have traditionally done well because they haven't made a fuss about what sorts of games they produce, they have let anyone develop games for their systems, as long as you pass the technical requirements, you can do what you like and sell what you like. That is why there is such a proliferation of PlayStation titles which you can also play on the PS2. That has been a really clever decision by them'.
(Publisher, March 2002).

'It is a lot more investment to work for Nintendo. There is less return on Nintendo games for the GameBoy Colour and GameBoy Advance. We earn about £1 or £2 on every one we sell. But you have to manufacture in excess of 80,000 units to break even and because they are on cartridges not discs, there is a lot of stock to hang on to and if you don't think you can sell that many it is an enormous risk.

Development costs for the handheld games are less, but it is so difficult to break even with so much stock. It just isn't worth while'. (Publisher, March 2002).

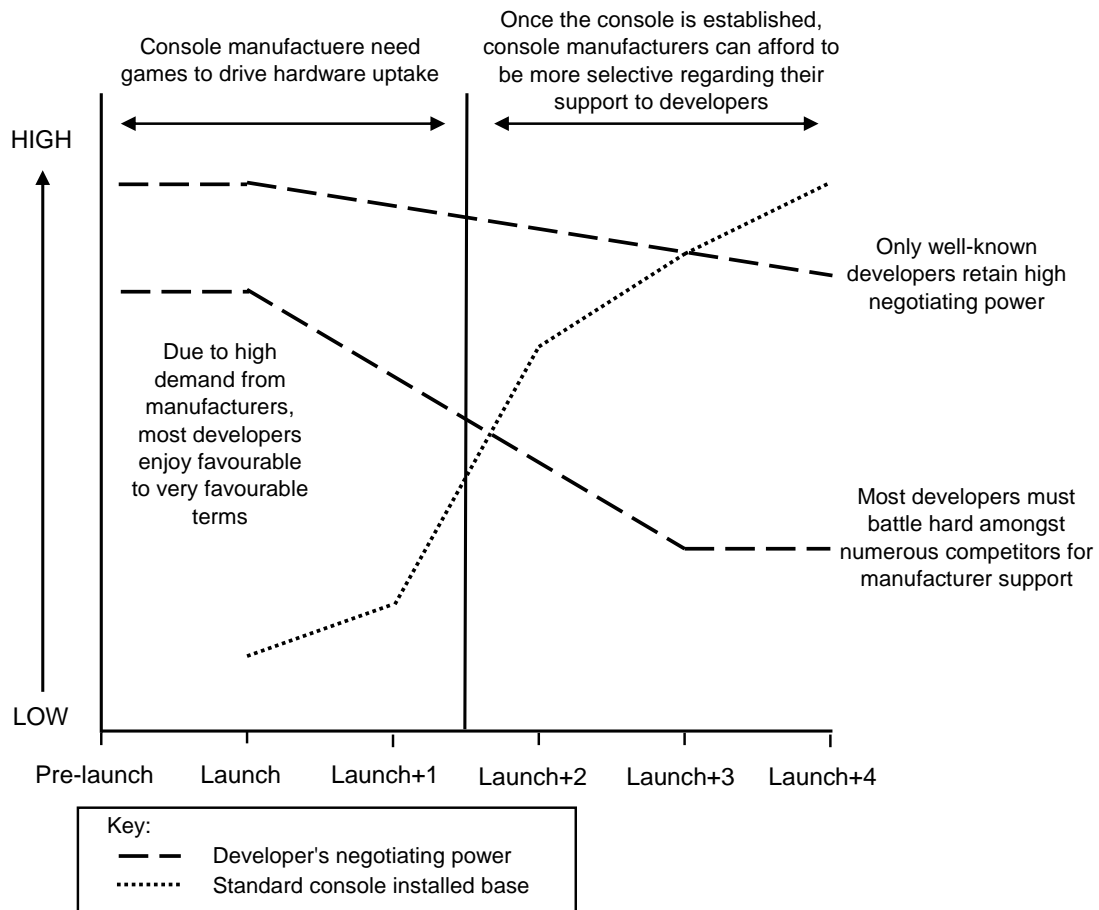


Figure 5: The variable bargaining power of games developers
 Source: Datamonitor (2003, Figure 5).

In comparison, as Table 2 shows, rival console manufacturers Microsoft and Nintendo have struggled to come close to rivalling Sony's installation base. Consequently, these hardware producers find it more difficult to attract publishers and developers as they offer smaller markets.

'Sometimes the hardware manufacturer will try to keep you to publishing a game on just their format – to be exclusive. They offer incentives, such as giving you

marketing money, but you have to weigh up what the installation base of that format is and if you are going to make any money. At the moment, PlayStation 2 is the only format that is worthwhile doing that for'. (Publisher, 2001).

Therefore, it is possible to observe the symbiotic relationship between hardware and software production.

The success of console manufacturers and publishers depends upon their ability to reach the consumers, hence the significant proportion (roughly 30%) of revenue captured by retailers. The relationship between publishers and retailers is often contested, and is the result of negotiations between these actors at the local, national and increasingly multinational scale.

'We work with games distribution companies to distribute games. Sometimes in other countries they may be the distribution arms of larger publishers, such as Codemasters, which can sometimes cause a conflict of interest if they are also releasing the game. Often we will outsource the PR and marketing to the distributors as they have as much interest in selling the games as we do, and they have more local knowledge. The fact that they are taking a cut of revenue generated can cause us difficulties. Larger publishers, such as Electronic Arts, have offices in every single country and don't have to hand out a margin to other people'. (Publisher, March 2002)

'We have a really good relationship with most of the major retailers....they help us reach our consumers and we give them the big titles they want. As some of the supermarkets have some into other markets we have been able to do bigger multinational deals with them which saves us time, and certainly money'
(Publisher, March 2002).

However, as the retailers are aware of their importance to the video games industry, they are able to counter the dominance publishers hold in other stages of the production network. In this highly competitive industry, the retailers are in a strong position and are able to negotiate favourable agreements.

While the power relationships between actors in the software production network are uneven, they are also greatly affected by their spatial dimensions. Indeed, the relationships outlined in Figure 4 must be placed within their geographical context. Primarily, these relations are conducted within the boundaries of the three major economic regions: North America, Europe and Asia Pacific. The prime reason for this bounding of activity is the organisational structures of the console manufacturers, through which they are able to gain a greater degree of control than would be possible in a truly global system. Publishers are required to submit code to the console manufacturer's base in the region in which they are located. For example, a UK-based publisher wishing to publish a game on PlayStation2 has to submit code to Sony Computer Entertainment Europe (SCEE). If accepted, SCEE will publish the game and manufacture games suitable for PAL territories. If the publisher wishes to sell the game in the US, they are required to begin the whole submission process again with Sony Computer Entertainment America (SCEA), but this is only possible if they have registered offices in North America.

'The console manufacturers have European publishers and American publishers. The bigger companies have publishing houses on both sides of the Atlantic, so it is not a problem for them. We are only a European publisher and if we wanted to register as an American publisher, we would need to set up a small office out there and any games we published in North America would have to be put through that office and submitted through SCEA or Nintendo US' (Publisher, April 2002)

Through this organisational structure, the console manufacturers have greater control over the release of software in each region, and maintain the tri-regional structure. It is also much easier for them to organise global releases of games than it is for third-party publishers. However, if actors are able to find ways to overcome this imposed divide, their power within the production network can be greatly increased. Firms strategies to achieve this include increasing in size to gain greater economies of scale, particularly in relation to distribution, increasing access to finance and distribution (either through vertical integration or exclusive agreements), and increasing the geographical extent of operations.

In particular publishers are highly connected and have developed a range of strategies to attempt to capture maximum value and thereby increase their power. The increased size and scope, both vertically and horizontally, of actors in the production network has resulted in the rapid internationalisation of software production and distribution. While it can be argued that the production of console hardware is global, software production is organised around the tri-region structure created by the console manufacturers. While this technicality could easily be overcome – conversion chips are freely, but unofficially available in most nations – these supra-regional divides are maintained by games developers and consumers alike. In fact, the geographical unevenness of video games production and consumption is further complicated by strong cultural differences between markets. The final section of this paper will discuss the cultural embeddedness of the video games industry in more detail.

4.3 The embeddedness of games as a cultural product

The development of the video games industry worldwide has varied widely in different national contexts, playing a significant role in determining the degree to which firms located in particular localities are connected to video production networks, and the nature of such linkages. For example, as Table 2 shows, despite being the world's third largest market for console games, the UK's largest publisher ranks only 15 globally. Instead, the UK has become a significant site of games development, with 15.3% of the global market share (by volume), compared to US (44.1%), Japan (35.3%), Germany (2.1%), France (1.7%) and Canada (1.5%) (DTI, 2002: 18). This share is disproportionate to the size of the UK, and is commonly explained by the dramatic success of affordable home computers such as the Commodore 64 in the 1980s. Anyone could programme their own games at home, and programming games developed on a large scale as a hobby (Lange, 2002). In addition, the BBC Computer Literacy Project started in 1981 to promote people's understanding of the opportunities provided by new microcomputers.

'Since no comparable production developed in other European countries, microcomputers and consequently games production were given far less support. In Germany, for example, there were just as many young people writing their own games for fun, but they were perceived more as a subculture than as the possible nucleus of a future growth market' (Lange, 2002: 51).

Therefore, while the digital entertainment industry evolved in the US alongside developments in microcomputer technologies, the UK developers were able to capitalise upon their cultural proximity to the US to gain support for their projects, both in terms of knowledge transfer and financing. This close relationship between US and UK

actors in the video games industry continues today, and is reflected in the strong presence of US publishing firms in the UK, and the high level of US acquisitions of UK firms (for examples, see Table 3).

The Japanese games industry is based upon different origins from that of Europe and North America. Technical capability and expertise in consumer electronics have served as a critical foundation for the early development of platforms in Japan (Aoyama & Izushi, 2003), and continue to offer competitive advantages for Japanese hardware producers. In contrast, the Japanese software industry draws upon the *manga* (the Japanese word for comic book) and animations films industry to provide creative and innovative inputs. Aoyama & Izushi (2003) suggest that a common labour pool is shared by these industries, facilitated by the importance of *manga* in Japanese popular culture. A distinct form of game with strong narratives has developed, such as role playing games featuring characters from *manga* and animation films. Indeed, many of the largest firms operating in the Japanese video games industry have their origins in the toy industry (for example, Nintendo and Bandai), or in arcade games (such as Capcom and Namco).

As the video games industry has increasingly internationalised, the North American and European markets have become closer, with publishers operating in both regions. It is clear, however, that the demands of video game consumers are not homogenising, as cultural differences remain importance considerations for publishers and developers. Despite relatively close cultural proximity, even some UK and US produced games require localisation before they are suitable for consumers. Indeed, there are distinct cultural differences between the demand for cultural products within and between the three software 'regions', reflecting the fact that video games, despite their high-

technology image, are cultural goods that are read in specific ways depending upon the locality in which they are produced. The greatest differences in the nature of video games occur between Japan and the other two core markets.

‘There are different mentalities about games in Europe and Japan. There is a lad here that buys a lot of Japanese games, but rarely does he come in with a Japanese game that he thinks anyone is going to like. Nintendo Europe, and include us in that collective, we know our market. Japanese people know their market. There are huge cultural differences so there isn’t really any reason why games should have anything in common’. (Publisher, April 2002).

Indeed, even the sale of hardware reflects cultural biases as there is a tendency for consoles to sell best in their home regions, for example, in 2003 Xbox gained 20% of the US market, but only 9% of Europe and 2% in Japan. In Japan, the PlayStation2 sells more in an average week than the Xbox has sold to date. This cultural specificity is more notably reflected in games software, and Table 4 represents the most recent figures on the top 10 games on sale in each of the three core markets. It is clear that the UK has the most diverse range of games, from predominately US publishers, but also from Japanese and UK firms. Surprisingly, half the top 10 games selling in the US are produced and published in Japan. In contrast, all the games sold in Japan are provided by Japanese publishers, with only one game produced from outside the country. This highlights the degree to which the Japanese video games market is isolated from the other two key geographical markets.

Table 4: Top 10 games by region, 2004**UK Top 10** (Week ending 5/6/04) Source: Adapted from ELSPA

Rank	Platform	Title	Publisher	Pub origin	Developer	Dev origin
1	PC/GC/PS2/GBA/XBX	Harry Potter - Prisoner of Azkaban	Electronic Arts	US	Electronic Arts	US
2	PS2/PC/XBX	UEFA Euro 2004 Portugal	EA Sports	US	EA Sports	US
3	PS2	Need for Speed: Underground	Electronic Arts	US	Electronic Arts	US
4	PS2/PC/XBX	Hitman: Contracts	Eidos	UK	Io Interactive	UK/Denmark
5	PS2	Grand Turismo 4: Prologue	SCEE	UK (Japan)	Polyphony Digital Ent.	Japan
6	GC	Pokémon Colosseum	Nintendo Europe	UK (Japan)	Genius Sonority	Japan
7	PC/PS2	Pro Evolution Soccer 3	Konami	Japan	Konami	Japan
8	GC/PS2/XBX/GBA	The Sims	Electronic Arts	US	Electronic Arts	US
9	GC/XBX/PS2	The Suffering	Midway	US	Midway	US
10	XBX/PS2	Fight Night 2004	EA Sports	US	EA Canada	Canada

Japan Top 10 (Week ending 5/6/04) Source: Adapted from ELSPA

Rank	Platform	Title	Publisher	Pub origin	Developer	Dev origin
1	PS2	Super Robot Battle MX	Banpresto	Japan	Banpresto	Japan.
2	PS2	Pachinko Slot! Fist of the North Star	Sammy	Japan	Sammy	Japan
3	PS2/PC	Grand Theft Auto: Vice City	Capcom Japan	Japan	Rockstar	UK.
4	GC	Wario World	Nintendo	Japan	Treasure	Japan
5	PS2	Atelier Iris - External Mana	Gust	Japan	Gust	Japan
6	GBA	Metroid Zero Mission	Nintendo	Japan	Nintendo	Japan
7	PS2	Tensyo Gakuen Gensouroku	Asmik Ace Ent.	Japan	Asmik Ace Ent.	Japan
8	PS2	Gensha do GO! FINAL	Taito	Japan	Taito	Japan
9	GC	Pikmin 2	Nintendo	Japan	Nintendo	Japan
10	PS2	Pachinko Slot Tokondensho: Inoki Festival	Success	Japan	Success	Japan

US Top 10 (Jan to March 2004) Source: Adapted from NDP Group figures cited in www.gamesinfo.com

Rank	Platform	Title	Publisher	Pub origin	Developer	Dev origin
1	PS2	NFL Street	EA Big	US	EA Big	US
2	PS2/XBX/PC	Need for Speed: Underground	Electronic Arts	US	Electronic Arts	US
3	XBX	Ninja Gaiden	Temco	Japan	Team Ninja	Japan
4	GC	Pokemon Colosseum	Nintendo America	Japan	Genius Sonority	Japan
5	GC	Sonic Heros	Sega of America	Japan	Sonic Team	Japan
6	PS2/GC/XBX	MVP Baseball 2004	EA Sports	US	EA Canada	Canada
7	GC	Final Fantasy Crystal Chronicles	Nintendo America	Japan	Square Enix	Japan
8	XBX	Halo	Microsoft	US	Bungie Studios	US
9	GC	Mario Kart: Double Dash	Nintendo America	Japan	Nintendo	Japan
10	PS2/GBA/XBX/GC	James Bond 007: Everything or Nothing	Electronic Arts	US	Electronic Arts	US

Despite Japan's domination of hardware production in the consumer electronics industry, cultural content production is relatively less important. Japanese ambitions to redress this imbalance have been limited by broader structural concerns. Morley & Robins (1995: 13) identify three activities of global media corporations: producing cultural products; distributing these products; and owning the hardware that delivers these products. They suggest that to penetrate multiple markets at least two of the above three activities are required. While Japanese video games firms are producing a specific cultural form, their isolation within their own supra-regional boundary during the internationalisation of North American and European activities, has reduced their access to international distribution. As Iwabushi (2004: 65) claims, Japanese cultural industries and Japanese media products cannot compete globally without Western partners. For example, the global distribution of *Pokémon: The First Movie* was handled by Warner Brothers, and Nintendo of America (who are relatively autonomous from the Kyoto headquarters and locally staffed) was responsible for international marketing of Pokémon, except in Nintendo's home market of Asia. Therefore, despite Nintendo's development of a hit global cultural product, originally a GameBoy game, neither Nintendo nor other Japanese firms were able to capitalise upon that success, as valuable functions such as distribution had to be passed to larger, more geographically extensive media conglomerates. The video games industry is positioned within broader cultural flows that are dominated by large media conglomerates creating an environment in which access to finance and distribution are increasingly important.

5. Conclusions

This paper has aimed to redress a little of the academic neglect of the video games industry by using a GPN framework to understand how the industry operates and how it is driven. The review of the evolution of gaming reveals how rapidly it has grown into a mature, internationalised industry. Traditional views of video games paint a picture of the archetypal global industry, facilitating the easy flow of culture between localities. However, while the production of console hardware operates at the global scale, seeking the most cost-effective suppliers and cheap production sites, the production of software should be considered international rather than global. By conceptualising the video games production network, it has been possible to examine how and by whom value is captured at each stage in the production network, to investigate the nature of relationships within and between these production stages, and to understand the resulting geographies of production. The powerful role of publishers has been revealed, as has their strategies to use mergers and acquisitions firstly within national boundaries, then within supra-regional contexts to expand their operations and power within the production network.

The implications of the internationalisation of publishing firms, and consolidation within three key centres of production – North America, Western Europe and Asia Pacific - are of concern to developers worldwide struggling to gain ever increasing budgets to make games. As has been observed in many other cultural industries, the global domination of media conglomerates limits the ability of smaller firms to gain access to finance and distribution (see, for example, Coe & Johns, 2004). It is argued in this paper that the geography of video games production networks is highly uneven, and

to be fully understood have to be placed within the broader context of global flows of culture. This, of course, has a profound developmental implications as the increasing power of a smaller number of video games companies located in key centres of production limits the ability of new, or peripheral, firms to enter the market. Given the particular interest of national and regional governments across the globe in high-tech industries as drivers of economic development, understandings of the organisational structure and geographical concentration of decision making in industries such as video games are essential.

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