

Minecraft Brick by Brick

A Case Study of a
Global Services Value Chain



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Foreword

The role of global value chains has become increasingly important in international trade. Focus has so far been mainly on goods, though. In this report, the National Board of Trade examines the global value chain of the video game 'Minecraft'. The video game industry has fully embraced today's digital opportunities. The production, distribution, and usage can be fully digitalised. This allows for the production to be divided into different tasks and spread out in time and space.

The report follows the tasks involved in producing, selling and distributing the game as well as value created by users playing the game. In short, we find a pure global services value chain.

With this case study, we hope to improve the understanding of services value chains and stimulate a debate about how these value chains can be facilitated by policy.

The report is written by Magnus Rentzhog with the help of Emilie Anér and Robert Leijon. We wish to give our special thanks to Daniel Kaplan at Mojang AB for his time and willingness to discuss Minecraft and Mojang in depth.

Stockholm in March 2013



Lena Johansson
Director General
National Board of Trade

Executive Summary

The video game industry is a fast-growing and export-intensive sector. The sector is heavily dependent upon innovation and R&D and is today based on an ever increasing digitalisation—both of production and distribution. Technological developments have created opportunities for splitting up the production of video games and spreading the tasks internationally.

'Minecraft' is a successful video game that was first developed by Swedish game producer Marcus 'Notch' Persson. Today it is produced by Mojang AB in Stockholm, Sweden. On the face of it, the game seems to be an entirely Swedish service. In this study, however, the National Board of Trade examines the tasks needed to produce, sell, and use the game. What is revealed is a complex chain of tasks and services that are carried out both in Sweden and abroad. In fact, Minecraft is a good example of a global services value chain. It is also argued that the video game industry is a forerunner, and thus an important indicator, of the entire ICT sector.

A theoretical framework for studying global value chains in services is developed in the study and then used for dividing the global services value chain of Minecraft into five stages: (1) innovation and R&D, (2) production, (3) distribution, (4) marketing and branding, and (5) consumption of the service. In each of these stages, value is created. Value is created both in Sweden by Mojang and internationally by other companies and actors. In the final part of the chain (consumption), value is created by the users and this, in turn, influences innovation and production. This creates an ongoing cycle of 'live' services development.

The study also discusses how services value chains might be different from goods chains in terms of where and how value is created. A common goods-based theory (the 'smiley face') could be revised to upgrade the value of the production stage, for example, and reduce the value of the distribution stage to better fit some key services characteristics.

Global services value chains, especially when based on digital opportunities and the ability to distribute services online, rely on open borders and telecommunication networks. Firms are also dependent upon attracting talent to further grow. For this they need to be able to establish themselves on markets where talent exists or to be able to move people to their places of production. These needs call for broad liberalization of services markets.

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1. The Video-Game Industry and the Case of ‘Minecraft’

In 2010 the global video game market was worth approximately \$56 billion—more than twice the size of the recorded-music industry and about three-fifths the size of the film industry.¹ It is predicted that video games will be the fastest-growing form of media over the next few years. Sales are projected to rise to \$82 billion by 2015 (out of which a large share is being exported²).³

Box 1

Minecraft

Game idea: Minecraft is about mining different blocks to create and build structures of choice. It is a so-called sandbox game, where the players can modify and create how they play. Single- or multiplayer play is possible.

First released: May 2009

Official release: November 2011

Original developer: Markus ‘Notch’ Persson

Owner: Notch Development AB

Current Developer: Mojang AB (under license)

Sold copies: 18 million (Dec 2012)
– 40,000 copies/day

The video game industry is in the forefront of innovations and digital services. The Internet is the backbone of today’s modern services sector and has resulted in an increasing digitalisation of the games market, where digital distribution soon might overtake traditional sales of physical copies. Technology has also created opportunities for splitting up the production of video games and spreading production tasks internationally. All production, distribution, and consumption can take place within the context of a completely digital environment.⁴ The video game industry is a part of the information, communication, and technology (ICT) sector, the fastest growing services sector in many countries.⁵ Insights from this case study are applicable to this larger sector.

The Swedish video game ‘Minecraft’ is an example of a video game that is distributed only digitally. The game is about creating and destroying various types of blocks in order to form structures, creations, and artwork. Owned by Swedish developer Notch and produced by Mojang AB in Stockholm, it is an example of how services can be produced and traded in the new digital world. On the face of it, Minecraft seems to be a service produced and sold from Sweden; a closer look reveals a game

with a complex chain of tasks needed to produce, distribute, and use the service. The study looks at this chain and maps out the tasks needed, where they are performed, and by whom. In other words, this study maps the global value chain of a digital service—the video game Minecraft.

1.1 Purpose and outline of this report

A great deal of attention and research has been committed to analyze so-called global value chains, that is, how innovations and components from a range of companies that are spread over different geographical locations come together to form a single product. Studies mapping global value chains, however, so far largely have focussed on trade in goods. The same holds true for the academic and policy debate.

There is a lack of research that focusses entirely on services production and its value chains, and few studies have been produced on this topic.

The purpose of this study is to map out the global value chain of a service. The study will reveal the complexities of the video games sector as well as highlight features applicable to other sectors, especially the ICT sector.

The National Board of Trade is a government agency working with trade and trade policy. Global value chains rewrite how trade is conducted and thereby challenge current trade policies and rules. Hence, the main interest of the Board is to identify how a modern trade policy can adapt to support global value chains.⁶ This will include the need to address other policy areas, looking beyond traditional trade issues.

The study focusses on the geographical aspects of value chains. Understanding the reasons behind the geographical breakdown is of interest because this spread can have trade-related explanations.⁷

The study begins with an overview of the relationship between global value chains and services. It will then introduce key concepts and provide a general background to the video game industry before looking specifically at Minecraft. Finally, the study draws some conclusions, including tentative trade policy conclusions.

The information on Minecraft and Mojang is based on an in-depth interview with Daniel Kaplan, business developer at Mojang AB, if not otherwise stated.⁸

2. Global Value Chains and Services

2.1 Introduction to global value chains and services

National Board of Trade (2013) is an introduction to services and global value chains.⁹ This chapter summarises that introduction to the topic.¹⁰

- Services relate to global value chains by
1. enabling the development of value chains and
 2. constituting parts of the value chains, because services are also being unbundled and traded as ‘tasks’.

2.1.1 Services as enablers of global value chains

Services are enablers of global value chains through, for example, communications, insurance, finance, and logistics. These services constitute the category of ‘other commercial services’ and have experienced the most rapid growth in world services trade. Some of these services—for example, financial services and transport services—are a part of nearly all value chains.

The efficiency of value chains depends heavily on the quality, price, and availability of services. Stephenson (2012) concludes that competitiveness in global value chains in goods is dependent upon efficient services inputs. USITC (2012) highlights the importance of services liberalisation for efficient value chains.¹¹

2.1.2 Services as tasks in value chains

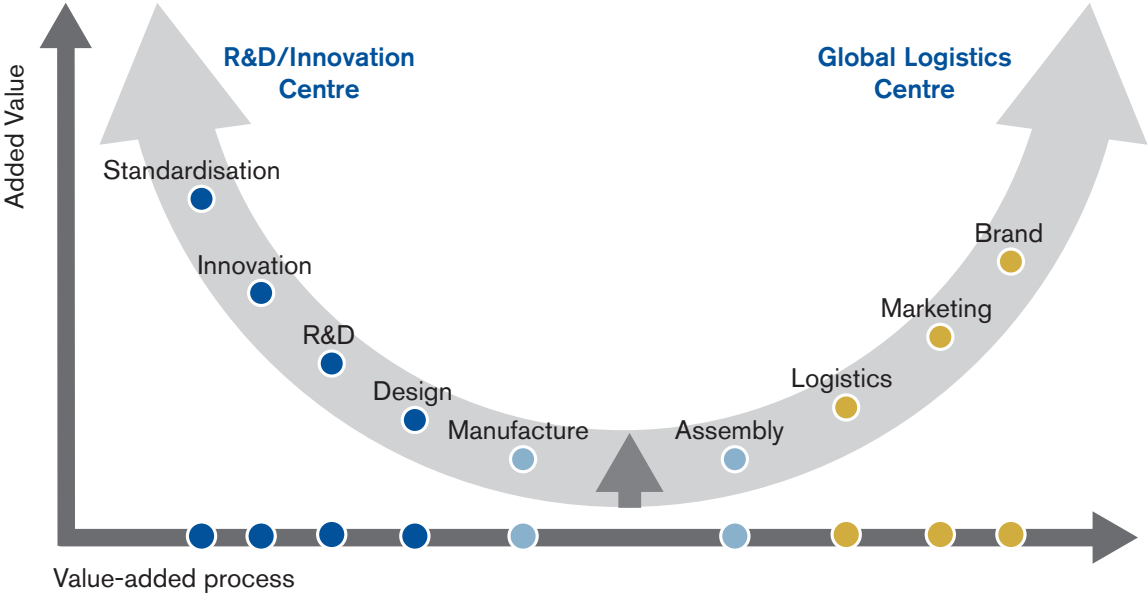
Services themselves are also being unbundled and traded as ‘tasks’. Tasks are increasingly being traded across national borders, even creating pure global services value chains. The example of Minecraft in this study is an example of such a services value chain.

Global services value chains are empowered by knowledge-intensive services industries where value can be captured and stored. Production of these services can then be separated from consumption and scaled up, creating higher added value final services. Cross-border digital trade then enables these services to be used anywhere in the world.

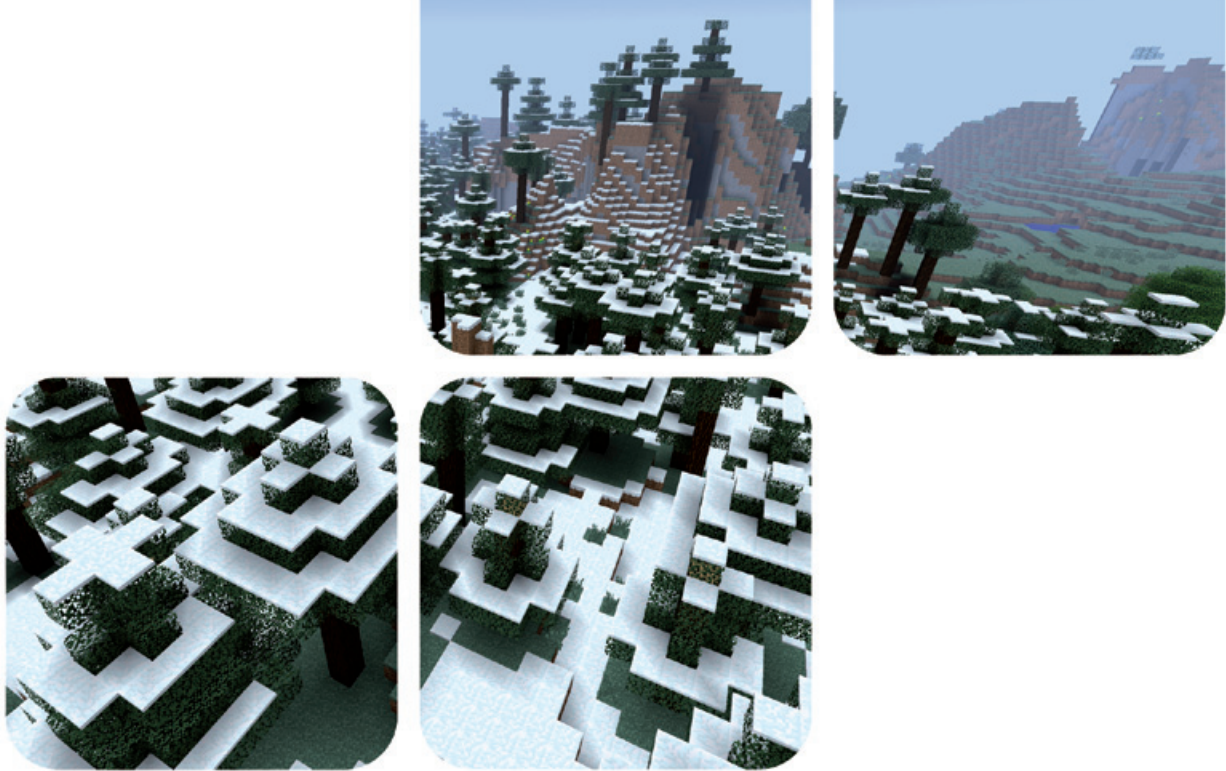
As in the case of goods, the objective of many services firms is to engage in increasingly higher value-adding ‘tasks’—for example, design, R&D, innovation, and marketing/brand development. This includes the video game industry.¹²

Figure 1 presents a stylised model of a goods-based value chain. It begins with upstream activities such as R&D and design, and continues through manufacturing and assembly to downstream activities such as marketing, brand management, and after-sales services. The most value- (and knowledge-) intensive activities are usually found in the beginning and the end of the chain. These are also

Figure 1: “Smiley Face”: Conceptual model of a value chain



Source: NBT 2012b



where services dominate manufacturing. This theory on the relationship between services and value chains can be depicted in the shape of a 'smiley face'. It must be noted that this is just a theory, even though it is widely used in the literature. It can be questioned whether the 'smiley face' is applicable to all value chains and whether the values are constant over time.¹³

Although there has been very little research on pure services value chains, such chains are being created in a variety of service sectors. This would include banking, tourism, audiovisual, and possibly also education and health services, as well as IT and business processing services. No one, however, has so far, as far as the Board knows, described a pure services value chain in detail.

2.2 Mapping a global services value chain

Studies on goods value chains usually include so-called teardowns, where physical products are disassembled to identify their component parts. The origins of the parts are then identified and the value of each part is calculated. The outcome is presented as a value chain. This study of Minecraft follows the same principle.

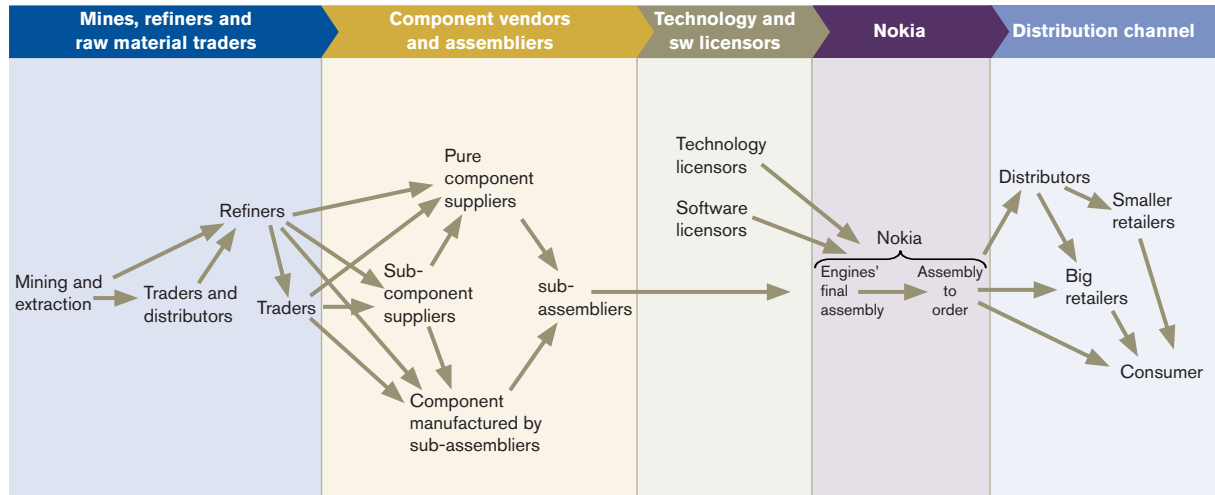
In this study, a global services value chain refers to the flow of services (provided in-house or purchased from outside) involved in providing a service for final consumption, including the actual use of the service. In each step, input is employed and value-adding activities are conducted and transferred as output to other participants in the supply chain.¹⁴

The 'smiley face', presented above, is used in this study to identify the different parts of the link. A certain adaption to the specifics of the video game sector is necessary, however. First and foremost, the tasks involved in producing a video game do not entirely correspond to the tasks in goods production ('design, manufacture, and assembly') but for simplicity will be presented under those three tasks. Second, logistics is not always a part of the value chain. Instead, the broader term distribution is used to capture, for example, digital distribution. Finally, the study does not discuss standardisation.

It is also important to understand innovation in a services setting. Innovation in the service sector is different from that of manufacturing. The latter case is mainly the result of a concentrated R&D effort, and the terms are often associated with manufacturing. By contrast, services innovations are usually much broader, encompassing improved service concepts (i.e., new or improved service products) and also service process innovation, service infrastructure innovation, customer process innovation, business model innovation, commercialisation innovation (sales, marketing, delivery), hybrid forms of innovation serving several user groups in different ways simultaneously, and service productivity innovation.¹⁵

Generally, R&D is a formal and clearly dedicated activity that is then presented to the market (a linear process). Innovation focusses on something new. Innovation does not necessarily include formal structures but can be a part of everyday firm activity together with clients and employees. It is a more open process and seldom linear. Innovation is more about improving something that already exists.¹⁶

Figure 2: Five stages of value creation

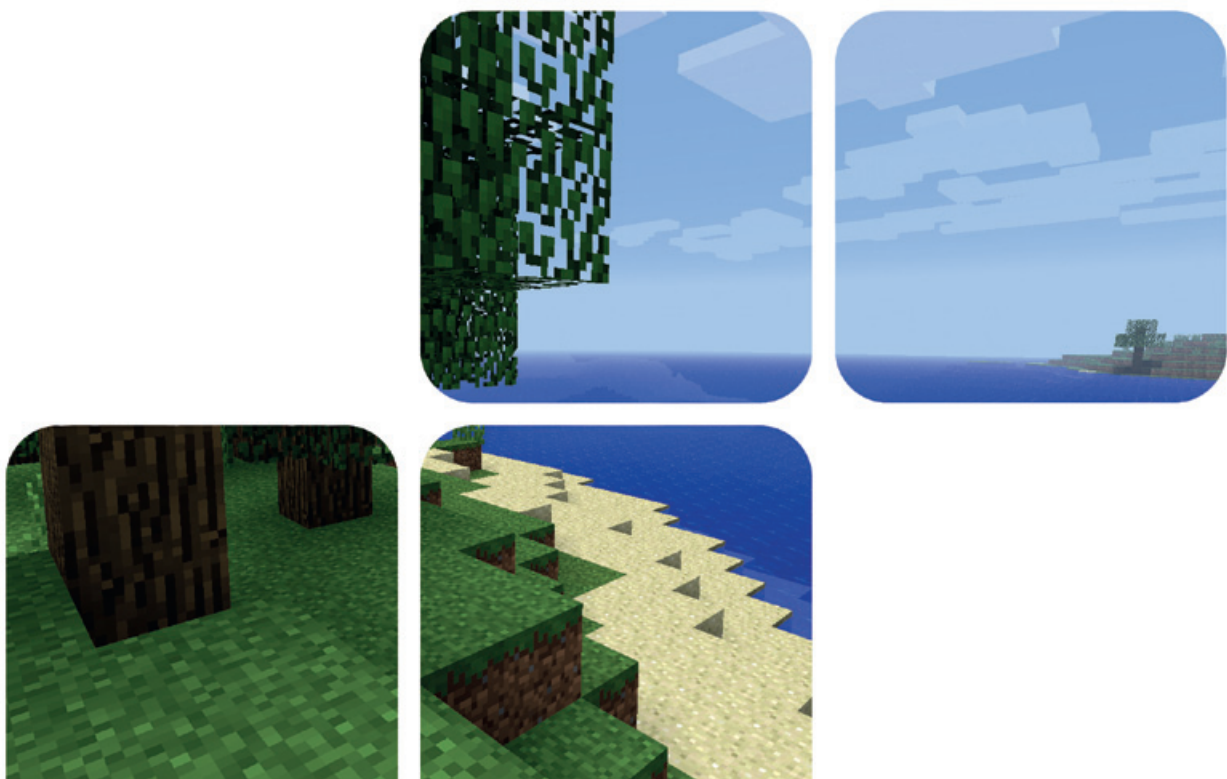


Source: Ali-Yrkkö et al. (2011)

Inspiration is also drawn from Ali-Yrkkö et al. (2011), where the chain is broken down in five stages (Figure 2). The teardown of Minecraft is, in the same vein, also broken down into five stages—with the individual parts of the ‘smiley face’ (from innovation to brand) allocated to the stage where they fit. Table 1 shows the theoretical model used when tearing down Minecraft.

Table 1: Theoretical model of a global services value chain

Innovation R&D	Production	Distribution	Marketing Brand	Consumption
	In 'smiley face': design, manufacture and assembly	In 'smiley face': logistics		Not in 'smiley face'



3. Tearing Down a Global Services Value Chain

In this chapter, the study focusses on the video game industry and the value chain of Minecraft. It starts with a presentation of the industry to give the reader an understanding of the sector, of features that are important to understand the industry, and of the way insights here can have a wider application. After that, Minecraft is broken down and presented task-by-task. The chapter ends with a description on the Swedish video game industry. This description will show how different companies have set up their value chains, giving the reader a greater understanding of global services value chains.

3.1 The features of the video game industry and how they relate to the ICT sector

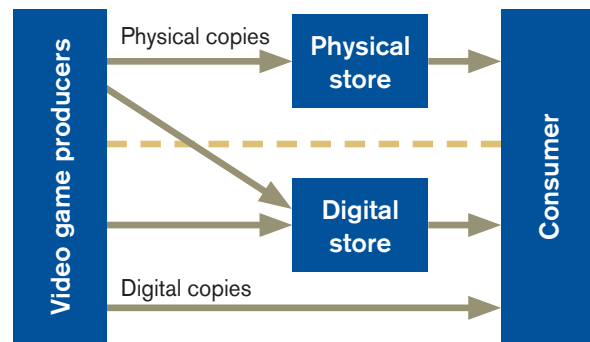
The video game sector is a fast-growing and export-intensive sector, and lessons learned can be applicable on a broader basis for the ICT sector. The video game industry also represents the cutting edge of current ICT development, not least the very sophisticated game engines that run the games. It is an innovative and R&D-heavy sector.¹⁷ Developments in this sector are later used by other parts of the ICT sector as well as by other businesses. Technology pioneered by games is now used in everything from military training programs to molecular biology and virtual showrooms for cars.¹⁸

A central feature in the production of video games is that consumer reactions, behaviour, and suggestions often influence the future development of the game. Hence, value is created that becomes input into the adaptive services development that characterises the video games sector (called 'live development' in the industry). In many instances, games are constantly updated and improved. As the case study will show, user input influences the continuous evolution of Minecraft. Including the use of the service is hence essential when studying the video game industry. Again, this is not an exclusive feature of this sector; many services are developed in cooperation with consumers,¹⁹ and discussions on this below have a wider application.

Because the production is digital, it is easily outsourced, both domestically and internationally.²⁰ Alternatively, game producers open their own development centers abroad, including in developing countries.²¹

Like production, video games are increasingly distributed digitally. This could include the entire games or so-called downloadable content (additions to the original game). This trend rewrites traditional forms of distribution because the value captured by retailers and distributors declines. Distribution can be direct to the consumer or through platforms and aggregators²² (such as Facebook, Steam,²³ and iTunes/Google Play).²⁴

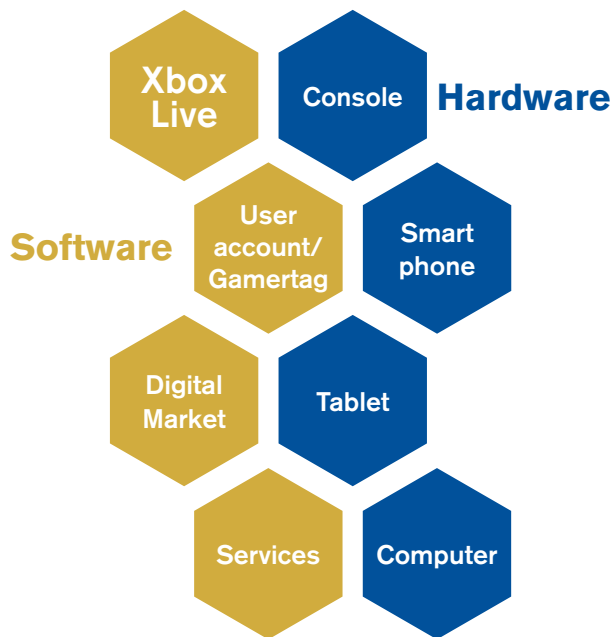
Figure 3: Digital and physical distribution channels



A final central feature is that video games are integrated parts of the evolving so-called digital ecosystems. These systems combine software and/or hardware from a community of digital devices and make them function as a whole. A digital ecosystem is not a separate entity but a combination of various tasks, services, hardware, and software operating together. This type of seamless interaction between all sorts of hardware devices all under one roof—an ecosystem—is probably a key aspect to future consumption and delivery of media services.

With regard to this study, digital ecosystems can be exemplified with Microsoft and its console, the Xbox 360. The console's networking and digital market delivery service is called Xbox Live, which allows players to integrate and play via an Internet connection. The most important updates and aspects of the service, however, have been to transform the console into a full-fledged digital media delivery center. Consumers can now acquire a game through the service's online market. Microsoft has also tied other media outlets into Xbox Live such as Amazon Instant Video, Netflix, and the sports channel ESPN. Social networks such as Facebook are also incorporated. This creates a single hub for media services accessible through the console.

Figure 4: Visualisation of the Microsoft digital ecosystem



Source: National Board of Trade

This picture shows a simplified depiction of the various elements that the service Xbox Live (software) consists of and its interaction with various platforms (hardware). Users create an account on Xbox Live to play games and gain access to its digital market and other services, Xbox Live is then accessible through the various hardware platforms.

Stacking services upon and together within a single window supported by the simplicity of one user interface and one user account connected to all content is what defines the software aspects of the ecosystem. The other part, hardware, has to do with integrating different devices with one another. Xbox Live is now accessible and connected to the user's account across different platforms.

3.2 Minecraft brick by brick — from innovation to consumption

In this section, Minecraft is torn down. The section describes all stages of the value chain, starting with innovation and R&D, moving to production and distribution, and finally setting out customer usage. The different tasks involved are identified, including where value is created geographically.²⁵

Innovation and R&D

Minecraft was originally developed by Markus 'Notch' Persson. It was inspired by the video game 'Infiniminer'. Java, an Oracle-owned programming language and computing platform, was used to create the game engine that runs Minecraft.²⁶

Java is an open-source platform and hence freely available to use and modify.²⁷ The main achievement is probably the **innovative** game idea, a simple but ingenious idea that has been constantly furthered as Minecraft has evolved—and, as will be presented below, has found its use outside the video game industry. The development included some measures of **R&D**, especially the use of Java to create the game engine.

Design, manufacture, and assembly (= production)

The **production** of a video game like Minecraft involves the following tasks: game design, programming, and graphics. Another task belonging to this category is sound, which in the case of Minecraft is handled separately from the production tasks.

A central feature of the production of Minecraft is the fact that production tasks, as well as innovation and development, are a very connected and continuous process at Mojang. Officially Mojang, at the time of this writing, has four graphic designers and ten programmers but no designers. In reality, however, all designers and programmers are participating in all aspects and updates of the game and can start with an innovation, a new graphic, or a design. The production tasks at Mojang hence cannot really be separated into distinct tasks.

Today, most of Mojang's employees involved in production are located in Stockholm. Three programmers are placed abroad, however, in Holland, Canada, and the United Kingdom.²⁸ One programmer is an external consultant but works at Mojang in Stockholm. A number of programmers involved in the development of the Xbox Live Arcade (XBLA) version of the game are employed at 4J Studios in Scotland (more below). In addition, some specific features have been developed on a contract basis by external actors, both inside and outside Sweden.²⁹

All **sounds and music** are done by a music producer in Germany.³⁰ Earlier versions of Minecraft also used sounds from the Freesound project.³¹ The game uses the '3d Sound System' and 'JOrbis', two Java-based open-source projects.³²

Producing a video game differs considerably from producing a good (and partly from other services). It is, for example, becoming more and more common that the product is not fully finalised when first distributed. Instead, the game is

constantly improved upon and evolves over time, adapting to consumer usage and new ideas, whether from in-house or from the so-called 'community' (i.e., a social network of individuals who interact through social media in order to pursue mutual interests or goals, in this case Minecraft³³). It is an adaptive services development process. Many other ICT services follow the same pattern of adaptive development.

Minecraft was first released in May 2009, and after many gradual updates, it was formally released as a full version in November 2011.³⁴ It is still being modified, and all updates have been based on in-house ideas, community suggestions, and consumer use.³⁵

Distribution

Minecraft is **distributed** only digitally. There are today four different distribution channels:

- (1) for PC/Mac through their own homepages
- (2) for Apple-based products (iOS) through Apple's iTunes
- (3) for Android-based products through Google's Google Play and
- (4) for Xbox Live Arcade (XBLA) through that network

The PC/Mac version is the original version of the game. It is distributed on www.minecraft.net, on servers powered by U.S.-based Amazon. Here the game is available for download, and payment is made through Skrill (credit card payments) and PayPal (online transactions). Skrill is based in the United Kingdom, while PayPal is from the United States.

The versions for smart phones (iOS and Android) are available at their respective virtual stores (iTunes and Google Play), and the two U.S.-based companies Apple and Google are distributors. They also take care of payment and transfers to Mojang.³⁶ The app 'Minecraft Reality' is found on iTunes. This app is produced by the Swedish '13th Lab' in collaboration with Mojang.

The XBLA version is distributed on the Xbox platform. U.S.-based Microsoft owns the Xbox platform, and they also take care of payment. For this service, Microsoft takes an undisclosed amount of the payment before transferring the rest to Mojang. XBLA users can also download a so-called skin-pack³⁷ produced by UK-based 'Army of Trolls'.

The XBLA version is developed by an external game studio, 4J Studios, in Scotland. 4J Studios develop the XBLA version on their own and get a percentage of the receipts. Mojang supervises the work and has the final say on issues relating to the creative aspects of the game.

The game is distributed digitally. Nevertheless, Minecraft has ventured into the sphere of **physical distribution**. Recently, the game can be acquired by using a so-called pre-paid card. This card is bought in stores and can be used to activate Minecraft on PC. The card is produced and distributed to stores by the American company InComm.

Marketing and brand

Mojang has never done any traditional **marketing**.³⁸ Other companies have actively marketed the game, however, using traditional methods. Microsoft has marketed the XBLA version, and Japanese/Swedish Sony Ericsson marketed an Android-based version that was optimised for their phone 'Xperia Play'.³⁹

Mojang is marketing the game in a more indirect way. Social media like Twitter, for example, are used to create interest in the game. Game shows and other interactions with the community are also examples of more indirect marketing.⁴⁰

The conscious use of indirect marketing and close interaction with the community (see below) are examples of how the Minecraft **brand** is built. This brand is in fact Mojang's greatest asset and value creator. Like most companies, Mojang is systematically building their brand but, as seen, they do not use traditional methods for brand building.

Brand building is about being seen and, in turn, securing continued sales. Using interaction with the community as the main tool, Mojang aims to create momentum and self-generate game interest. The ultimate goal is creating word-of-mouth marketing,⁴¹ where users themselves sell the game for Mojang. This is an organic development, where Mojang feeds the community and the community in turn helps strengthen the brand and spread knowledge of the game to more customers.

Marketing and brand help create **spin-off products and services**. Minecraft merchandise is available, for example. Danish LEGO has released Minecraft Lego. Mojang also works with Think Geek and J!nx, who both produce Minecraft merchandise under license. Think Geek and J!nx are U.S.-based companies. Mojang does not sell any merchandise; their homepages only direct customers to Think Geek and J!nx. All merchandise relies heavily on the Minecraft brand to sell.

Community interest and subsequent brand spreading has also helped Minecraft expand to other services sectors. A special version of Minecraft is used in schools. MinecraftEDU is driven by a Finnish company using a licensed version. Also, Svensk Byggtjänst has a project called 'Mina kvarter' ('My blocks')—a project where people living in a specific area can build suggestions for

local development. The tool used on that site is Minecraft. This project has in turn become a UN Habitat program called 'Block by Block', aimed at letting people in poor areas in developing countries participate in local development.⁴² Beyond illustrating how game interest spreads the game to new areas, these examples show how video game innovations can spur creation of new services.

Consuming the service

When a customer buys Minecraft, he or she will download it on a PC/Mac, XBox, or smart phone. The customer—if a PC/Mac version is bought—must register on Mojang's so-called log-in server. This server is hosted by Amazon and is placed in the United States. Registration of non-PC/Mac versions will take place on those platforms and the servers that belong to those networks.

Once the PC/Mac game is registered, downloaded, and installed, the user must access a third-party server to play the game. Mojang does not run a 'play-server' on their own, so all servers used for playing the game are run by third parties.

Customers have access to support, either from Mojang in Stockholm or from two independent consultants in Seattle, Washington, United States. With two support centers, Mojang can cover different time zones, covering approximately 90% of their users.

Game users make up the very large and active community surrounding Minecraft. The community can be seen as a prolongation of the value chain described in this paper because the community uses, for example, third-party forums to discuss aspects of the game⁴³ and uses YouTube to post creations.⁴⁴

However, when we discuss the value chain of Minecraft in this paper, we see that the community is of importance for other reasons. First, two persons at Mojang are employed to handle community relations. This can be seen as a part of an indirect marketing strategy. Second, and more important, the community influences the adaptive game development of Minecraft. Mojang follows ongoing discussions about the game and users' modifications of the game. Those discussions and modifications may influence internal decisions on how to further develop the game, both at innovation and production levels. At times, persons in the community are invited to actively help develop Minecraft. Mojang has also found talents in the community and employed them.⁴⁵ Hence, community activity is an essential part of the value chain, tying together innovation, production, and brand building with final usage.⁴⁶

Summary

The tear-down above clearly exemplifies the existence of global services value chains and how these value chains can differ from traditional goods value chains.

The value chain of Minecraft reveals a complex chain even for a small company like Mojang. Additionally, today's digital environment clearly enables a small company to distribute tasks to suit its business model and to bypass traditional actors (e.g., by not using physical delivery, Mojang bypasses traditional distributors and retailers).

3.3 A picture of the Minecraft value chain

Figure 5 shows a stylised Minecraft value chain.

3.4 Variations on global services value chains as exemplified by the Swedish video game industry

Minecraft is one example of what a global services value chain might look like. In this chapter, the Swedish video game industry is examined to broaden the picture of value chains in this industry.

Considering the small size of Sweden, the Swedish game industry is relatively successful with international hits like DICE's Battlefield series, Ubisoft Massive's 'Far Cry', Avalanche Studio's 'Just Cause', and others. Another example is King.com—the largest company in the world when it comes to social games (that is, games developed for Facebook and other social networks).⁴⁷

Box 2

The Swedish video game industry 2011

Number of companies: 117 (+ 10% compared with 2010)

Turnover: 2.32 billion SEK (+ 96%)

Result: 128 million SEK (+ 747%)

Employed in the sector: 1,512 (+ 26%)

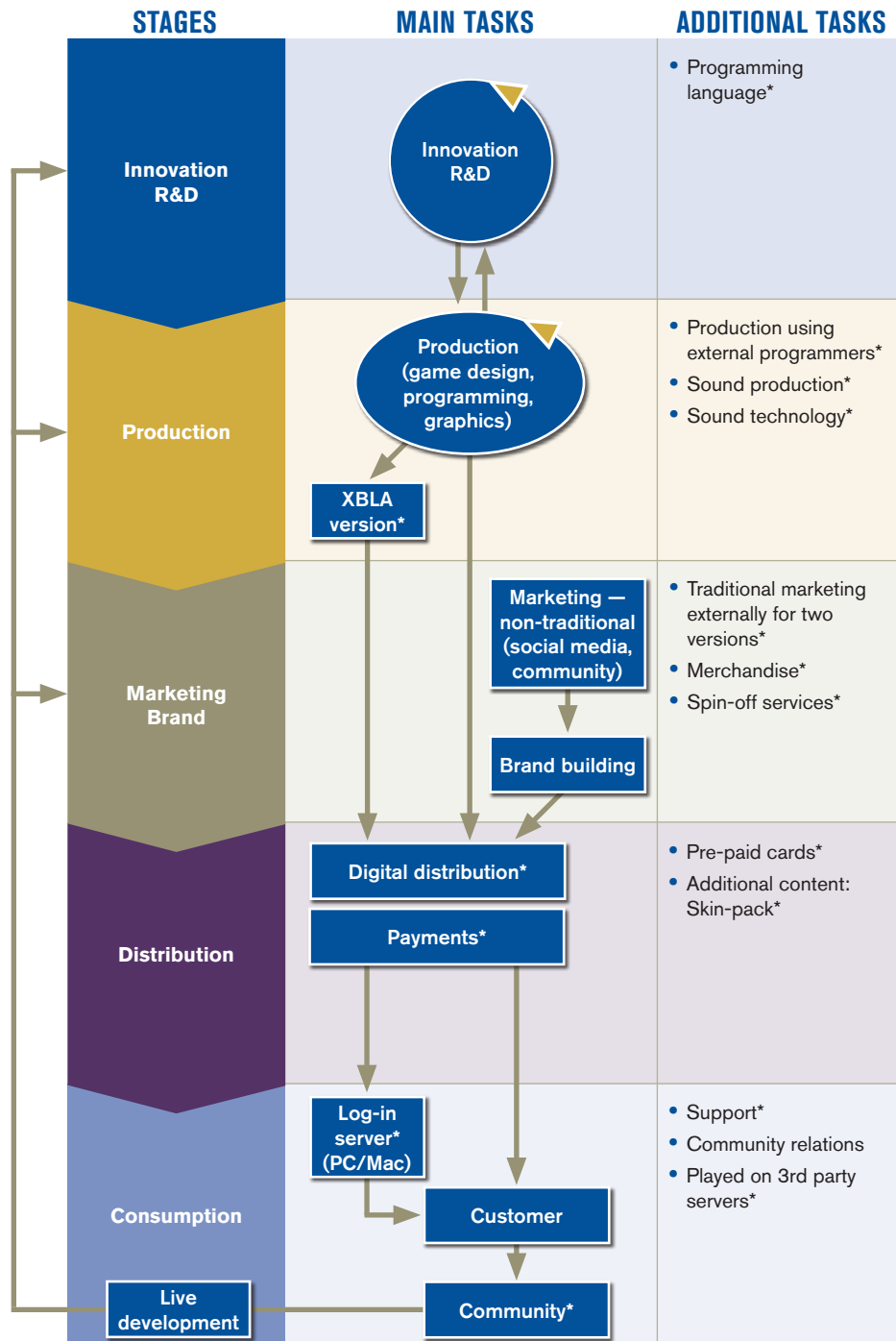
Turnover per employee: 1,532,000 SEK (+ 56%)

Total turnover is larger for digitally than physically distributed games.

Largest actors (turnover): Mojang, DICE, Stardoll, Paradox Interactive, Avalanche Studios

Largest actors (employed): DICE, Ubisoft Massive, Avalanche Studios, Stardoll, Starbreeze

Figure 5: The Minecraft value chain



Source: National Board of Trade

This figure describes in a simplified manner the value chain of Minecraft. From up to down, the left column sets out the stages of the value chain. The central column indicates the main tasks and services. In the right hand column, additional tasks and services of the value chain are presented. An * indicates that the task/service is partly or fully done by other actors than Mojang—mostly outside Sweden. The circles around innovation/R&D and production emphasise the continuous development of the game, partly influenced by the users of the game (the ‘community’). The arrow on the far left shows this ‘live development’. In this simplified picture, marketing/branding is placed before distribution, whereas in reality these activities happen continuously in most stages of the chain.

The Swedish video game industry includes independent game producers as well as relatively large developers belonging to the multinational game corporations. For example, DICE is a wholly owned subsidiary of Electronic Arts (EA) and Ubisoft Massive belongs to the corporate group Ubisoft Entertainment. Being a part of multinational corporations/networks means that, for example, DICE can use EA's distribution networks, financial backing, and other EA studios as outsourcing or learning partners.⁴⁸ At the same time, they might be only a part of the production value chain, that is, they have tasks outsourced to them.⁴⁹

The larger Swedish game developers usually outsource part of the production, both within Sweden and internationally. An extreme version of this is Paradox Interactive, a company that today is a game publisher, focussing on the ends of the value chain (that is, the high value parts) while basically outsourcing the rest. Mostly, however, outsourcing is more limited and used where specific competences or extra resources are needed. Mojang's collaboration with 4J Studios is an example of this. Obviously, Swedish developers are also receiving outsource partners, doing work for foreign-based companies.

Competence is key in video game development and the growth of the industry. Attracting the right competence is paramount for the developers. Beyond domestic supply, lack of competence can be solved by attracting foreign R&D as well as specialists to Sweden. Attracting talent can be done on a permanent or time-specified contract basis. Other Swedish game studios have expanded abroad to attract competence—and, equally important, to get closer to business partners. Mindark is in Singapore and Mexico, for example, while King.com has offices in the United Kingdom, Germany, Spain, Italy, Malta, Romania, and the United States. These latter examples add to the global nature of the production.

Many games offer downloadable content (DLC), which is in addition to the original game (for example new levels, characters, and challenges).⁵⁰ This is

an important source of income and a part of the value chain. Mojang uses this only for the XBLA version. For other Swedish developers, DLC is the main source of income.⁵¹

Mojang represents so-called indie developers⁵², whereas Ubisoft Massive and DICE are part of multinational company groups. Massive and DICE produce so-called AAA games (high-budget games). Beyond sequels, AAA games tend to be based to a large extent on well-known sporting or pop cultural brands (for example box-office hits) with a large, already existing fan base to explore. Using an existing fan base will make it easier to guarantee sales because many fans will acquire the games to follow new story elements that the games provide. This way larger game producers do not necessarily have to develop a new brand to secure large sales—sales rely heavily on recognition of an existing brand. Thereby, AAA games avoid many of the risky elements of creating awareness, attention, and excitement around a new brand and story line, thus taking a safer route and focussing less on innovation. Indie producers, on the other hand, rely heavily on innovative game concepts and brand building to secure interest and subsequent sales. This difference affects the value of innovation, branding, and marketing for indie producers and AAA game producers.

A final aspect of game development is the move towards digital distribution and games made for mobile phones, social media, and online play. The digital distribution is growing faster in Sweden than traditional distribution through physical retailers. AAA games are still the top sellers, with Minecraft as an exception. Nevertheless, digital distribution makes it easier for developers to reach a larger market. As for value chains, they rewrite how distribution is conducted (see also chapter 3.1.). Digital distribution also creates innovative ways of marketing and financing. Marketing through forums and social media by Mojang was described above. Paradox also uses this tool successfully. Crowd sourcing and crowd funding⁵³ are also common in the industry.



4. Discussion

4.1 Services compared to goods value chains

As we have seen, global goods value creation can be stylised as a ‘smiley face’ (chapter 2.1.2), with the most value added in the ends of the value chain and the least value added in the middle (manufacturing and assembly). As discussed above, it is widely used to describe global value chains.

The Board suggests that the ‘smiley face’ could be remodeled to better fit services sectors. As the Minecraft example shows, the different parts of the ‘smiley’ might need to be revised or exchanged. It is not always possible to separate design, manufacturing, and assembly, and these parts might not even have an equivalent in the services sector. The same goes for logistics, which has been exchanged for distribution in this study.

Beyond that, a conceptualised global services value chain might have another form than a ‘smile’. Differences in innovation, production, and distribution between manufacturing and services would indicate that value is created in slightly different places in the chain. Looking at the entire video game industry and discussions on how services differ from goods, the Board suggests that a figure would probably have innovation and brand in the ends with the highest value. R&D is important for some companies and creates value but less so than innovation, just as in the goods example. However, the main difference is probably that the ‘production’ (design, manufacturing, and assembly) is more

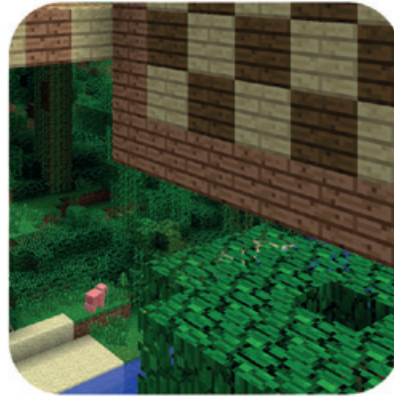
important compared to the goods model. It probably generates more value in general in services than in goods, because the production of services often is intimately tied to development, marketing, and innovation. Distribution, on the other hand, can have less value added.⁵⁴ Marketing will probably stay where it is in the ‘smiley’. In short, the shape of a smile might not be relevant in this case.

4.2 Global services value chains and trade liberalisation

The Minecraft value chain and the Swedish industry description highlight two crucial building blocks for video game developers and their value chains—open borders for cross-border transactions and the need to attract talent/competence. Both have clear trade angles.

Liberalised ICT, telecommunication, and distribution services are essential for production, distribution, and usage of video games (as well as most ICT products). Without mostly unrestricted access, the global services value chain would not be possible to uphold. Well-developed infrastructure is also essential. In addition, international payments are essential for the business model of Mojang and, hence, liberalised financial services are necessary. In both instances, the cross-border supply of these services needs to be open (‘mode 1’ in GATS terms).⁵⁵

Attracting the right competence is essential for companies in the sector. Swedish firms secure com-



petence by establishing themselves abroad or, like Mojang, attracting talent to Sweden—in many cases on a temporary basis. Hence, both ‘mode 3’ (local establishment) and ‘mode 4’ (temporary movement of natural persons) are important. Mojang can take advantage of the liberal Swedish labor migration system, which gives foreign-based employees access to Sweden. Unfortunately, procedural obstacles have slowed down this movement—for example, processing times for visas and work permits.⁵⁶ This shows that traditional trade policy (here market access for natural persons) might not be enough to support companies’ value chains and business plans. New issues need to be addressed—for example, visa issues.⁵⁷ Moreover, other policy areas beyond trade need to be discussed to support the development of services value chains, including education and infrastructure.⁵⁸

The needs of Minecraft and the Swedish games industry reflect the conclusion in Stevenson (2012) about global services value chains—namely, the need for modal neutrality. Services firms are ‘multi-modal’ and provide services through several modes of supply; consequently, their operations fare best if allowed to use all modes when needed.⁵⁹

Beyond services delivery, other trade-related issues might influence the value chain. Restrictions relating to data transfer and differences in intellectual property protection indirectly affect the Minecraft value chain.⁶⁰ For example, the existence of software patents in the United States is contested and could influence how firms decide to create their value chains. For Mojang, this is one of several factors behind the decision not to establish in the United States.⁶¹

The actual set-up of Minecraft (‘who does what’) is not directly based on trade-related concerns. More indirectly, trade is essential because the entire business model is based upon the existence of open and free trade of digital content. Instead other factors influence the set-up. A very prominent aspect is the cluster of talent and games companies in Stockholm (most companies are actually centered in a part of Stockholm called ‘Södermalm’), making it easy to acquire local talent and easier attract foreign talent to move to Stockholm. It also spurs both competition and cooperation.⁶² This underscores the conclusion that creation of global value chains depends on a number of different policy measures (as well as socio-cultural aspects).⁶³

5. Concluding Remarks

Global services value chains can be very multifaceted, involving a large number of tasks spread out geographically, as the example in this study shows. On the face of it, Minecraft seems to be a very Swedish based service, produced in Stockholm by Mojang AB. When we start to examine the tasks involved in inventing, producing, distributing, and using the game, however, a much more complex picture is presented. With the help of digital systems, Mojang can, from its office, reach a global customer base and take advantage of services offered by companies established on the other side of the world.

Nevertheless, while being a part of the global village, the local connection is important, and the production of Minecraft (or other services) will never be fully spread out. National sourcing will always be important;⁶⁴ Mojang produces most of the tasks of the chain in-house—and is actually trying to gather all production tasks (minus music) in-house. Hence, the global and local aspects interact, and both are equally important in the global value chain.

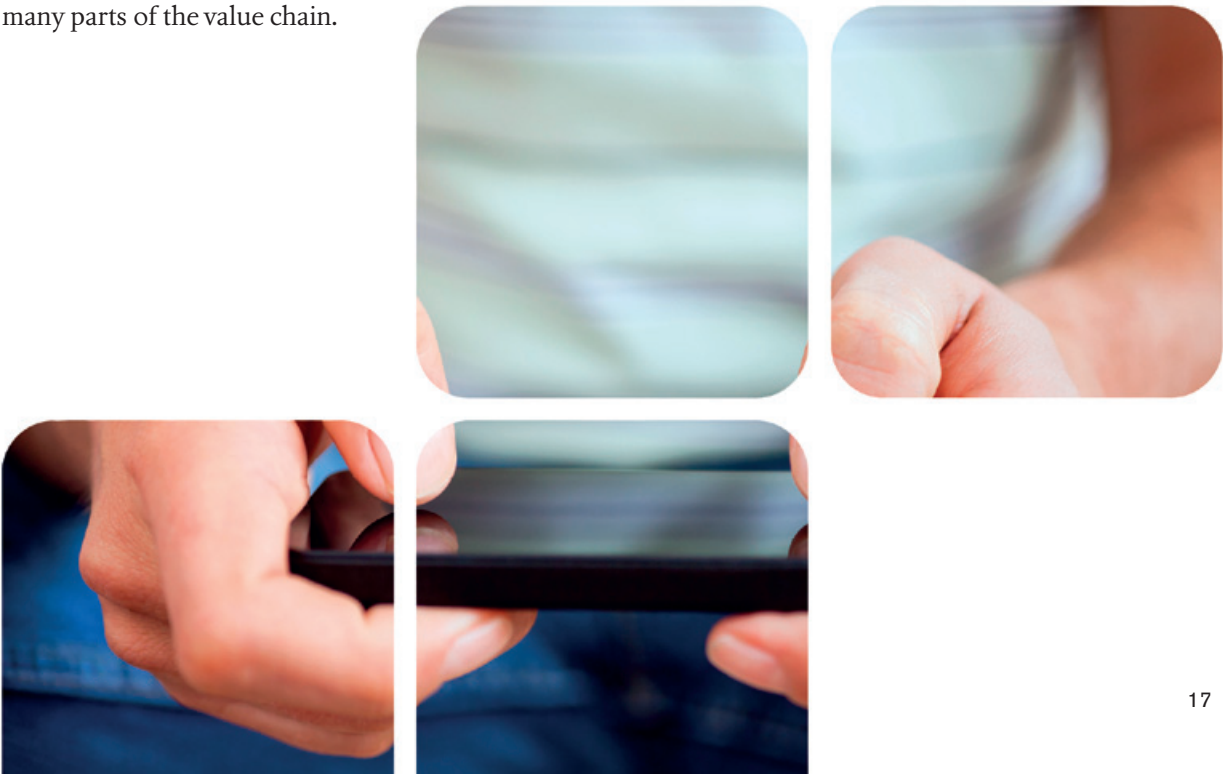
For Minecraft, most of the tasks performed externally happen to be done by U.S.-based companies. But, as the general presentation of the Swedish video game industry reveals, the value chain can be very spread out with almost all tasks in the chain being outsourced internationally.

Another note is that the case of Mojang/Minecraft exemplifies innovation in the services industry. With an innovative game approach, production set-up, and marketing, it can be concluded that Minecraft is very innovative in many parts of the value chain.

As discussed above under 3.1, many of the features of this Minecraft example are applicable to other services industries, not the least the ICT sector and other digital services. Many companies in these sectors share the innovative thrust of Mojang/Minecraft, the move towards digital distribution, and the need for an open trade policy (including movement of physical persons) to exploit potential markets, attract competence, and construct suitable and competitive business models.⁶⁵ Hence, Minecraft being just an example of a digital service, this case study exemplifies the demands and architecture of a fast-growing global industry and furthers the trade narrative of global value chains.

This study takes a first look at global services value chains. Global services value chains need to be thoroughly studied and possible implications for trade rules and policy need to be better understood. Only then can the trading system be adapted to the needs of modern business and business models.

In short, the ultimate aim of studying global services value chains is to ensure that trade policy supports trade. The digitalised trading environment is very different from trade only a couple of decades back—when current trading rules were written. Both rules and negotiation positions might need to be revisited to better support business realities.⁶⁶ This case study indicates areas where policy makers might start looking in order to create a modern trade policy.



Notes

- 1 Counting both DVD sales and box-office receipts.
- 2 For example, 90% of Swedish video games are exported. Source: Dataspelebranschen homepage.
- 3 The Economist (2011).
- 4 In fact, 75% of all new entrants to the software market distribute their products online. Lee-Makiyama (2011).
- 5 WTO (2012).
- 6 See, e.g., National Board of Trade (2012a).
- 7 In this study, we will refer to company headquarters to indicate where value is created geographically. We are aware that many services might in fact be performed in other locations. However, it is beyond this study to thoroughly investigate this further. Here, it is enough to conclude the international dimension.
- 8 Kaplan (2012b).
- 9 See also Stephenson (2012),
- 10 A separate but closely related phenomenon is that of 'servicification', whereby manufacturing firms increasingly buy, produce, sell, and export more services as integrated or accompanying parts of their primary 'offer'. This is in part a reflection of the key role played by services as both the glue and facilitator of global value chains. See National Board of Trade (2012b).
- 11 Like conclusions are drawn about services and the competitiveness of manufacturing firms in National Board of Trade (2010).
- 12 Kaplan (2012b).
- 13 For thoughts on the increased value of manufacturing and current trends in the United States about 'insourcing', see, e.g., Fallows (2012) and Mallaby (2013).
- 14 This definition is based on Ali-Yrkkö et al. (2011) and Gereffi and Fernandez-Stark (2011).
- 15 EU Commission (2009). Five key characteristics of services innovation are (1) a shared process between a service provider and its customers, (2) the conceptual and intangible nature (innovation does not result in a tangible product but involves value propositions), (3) a combinatory or architectural nature where innovation in services is not nor is to be regarded as a separate entity (new combinations of existing service concepts and apply them in a new context), (4) demanding in terms of replication and scaling and (5) originates from a distributed innovation effort. Janssen, den Hertog and Kaashoek (2012).
- 16 Martinsson and Cervantes (2012).
- 17 Forty percent of UK game developers have a budget dedicated to R&D, representing 20% of turnover. Source: TIGA homepage
- 18 Economist (2011) and Growth Analysis (2011). Another example is Swedish company Hansoft, which has developed techniques used by Boeing (Swedish Games Industry 2012).
- 19 EU Commission (2009).
- 20 In Great Britain, 86% of all game developers outsource part of the production. Swedish Games Industry (2012).
- 21 Swedish Games Industry (2012).
- 22 An aggregator is a Web site or computer software that aggregates a specific type of information from multiple online sources.
- 23 A distribution site for games.
- 24 "The Video Game Industry" homepage.
- 25 See footnote 7 above on geographical aspects.
- 26 A game engine is a system designed for creating and developing video games. Game engines can provide a software framework used to create the games.
- 27 Open-source software is software that is available with the source code. The source code is provided under an open-source license that allows the user to change and to improve, among other things, the software.
- 28 Mojang is trying to move all production employees to Stockholm because it facilitates communication and the process of game development.
- 29 For example a so called 'skin-pack' was produced by the UK-based 'Army of Trolls' for the XBLA version.
- 30 Daniel 'C418' Rosenfeld
- 31 Freesound project is an open-source sound base.
- 32 '3d Sound System' is created and run by Paul Lamb (United States) while 'JOrbis' is audio and music encoding format produced by JCraft (Japan).
- 33 These virtual communities all encourage interaction, sometimes focussing around a particular interest or sometimes just to communicate. Some virtual communities do both. They allow users to interact over a shared passion, whether it is through message boards, chat rooms, social networking sites, or virtual worlds (Source: Wikipedia).
- 34 As of the date of this writing (January 2013), version 1.4.7 is the latest update of the official game released a little of one year earlier (PC version).
- 35 Goldberg and Larsson (2012).
- 36 Apple and Google take 30% of payments; the rest goes to Mojang. This is standard.
- 37 A 'skin-pack' is a set of figures that can replace the original characters of the game.
- 38 Billboards, TV spots, etc.
- 39 Goldberg and Larsson (2012).
- 40 Goldberg and Larsson (2012).
- 41 Word of mouth is a primary feature regarding marketing when it comes to video games. Word of mouth has always been important for all sectors and industries but when it comes to games, it has a different type of interconnectedness where consumers themselves can be megaphones for millions through the Web. Thus marketing can be a bottoms-up process, community based, comments on

- games Web sites, blogs, social networks—all of them freely accessible and exposed for everyone with an Internet connection.
- 42 This project is sponsored by Mojang.
- 43 The main discussion forum is minecraftforum.net powered by Curse from the United States.
- 44 YouTube is owned by Google. A search for 'Minecraft' generates about 7.5 million hits on YouTube.
- 45 The programmers from Holland, the United Kingdom, and Canada mentioned under 'Production' above were employed after they had developed a tool called 'Bukkit'. Also, one of the two persons responsible for community relations was found on YouTube.
- 46 Community influence is very clear in this case. However, it must be noted that this is not isolated to this sector or to services production. In fact, even the manufacturing industry uses the 'community' in, for example, the process of differentiating their products. Discussions with customers on social networks sites influence product developments. Nordås and Kim (forthcoming).
- 47 This chapter is based upon Swedish Games Industry (2012).
- 48 BioWare (EA partner) visited DICE to learn about how DICE uses sound in their games. Source: BioWare homepage. Additionally, DICE's graphic engine is used in Medal of Honor (by an EA-studio in the United States). Source: Medal of Honor homepage.
- 49 Growth Analysis (2011).
- 50 DLC differs from expansion packs by being of a shorter and simpler character and available only digitally.
- 51 Even DICE uses this as a source of income. Growth Analysis (2011).
- 52 That is, small independent producers that do not belong to large multinational company groups.
- 53 Crowd sourcing is when tasks are outsourced to an undefined public. Crowd funding is when potential users help finance a game during the development phase. It is especially common in the app industry.
- 54 Of course, managing digital distribution can be a very lucrative business. As part of another service's value chain, however, this part of the chain is relatively less valuable due to the low costs and prices involved.
- 55 GATS = General Agreement on Trade in Services. Services can be delivered in four ways (modes of supply)—cross-border, by consumption abroad, by local establishment, and through the temporary presence of natural persons.
- 56 Kaplan (2012a).
- 57 See, e.g., Baldwin (2012).
- 58 National Board of Trade (2013).
- 59 A like conclusion is drawn in National Board of Trade (2010) and (2012).
- 60 IPR protection is, on a more general level, an important factor in setting up value chains. USITC (2012).
- 61 Kaplan (2012a) and (2012b).
- 62 Arnroth (2012).
- 63 See National Board of Trade (2013) for more on this.
- 64 National Board of Trade (2012b).
- 65 IT&Telekomföretagen (2012).
- 66 The National Board of Trade conclusion is drawn in a series of reports by the Board, including in National Board of Trade (2010, 2012a, b, c, d).

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