INDEPENDENT GAME DEVELOPMENT: PRICE OF FREEDOM

BARıŞ PARLAN

Abstract

Within the video game development aspect, video games that developed with highest budget and promotion informally classified as AAA game. Developments that rejecting financial support from any publisher to keep up freedom against mainstream companies named as *Independent video game* even though its definition is open to interpretations. This article proposes a field study of production and distribution of the digital video game industry to see whether independent video game development is an independent alternative to mainstream production.

Research within companies and their products segmented on production tools, distribution systems, and manufactured hardware's that used by independent developers of digital video games gives us an insight of power relations within the industry. Digital video game developers, *free* video game development engines, leading digital distribution systems, developer based investigation of most played video game, and considering biggest acquisitions of the industry provides us a clear view of political economy. Statistical evidence and common ground of reviews used to form sample.

Companies claim that they are providing free production tools such as video game engines and digital distribution systems to support independent digital video game development. This article identifies power relations within the industry to underline corporations support of independent development is an exploitation of them as a risk-free research & development service. This free support becomes well-planned sub-part of capitalist structure that established by very same corporations.

While this research includes technology, law and regulation, and occupational careers facets within introduction and literature review, it highly focuses on industry structure, organization structure and market within research part in order to draw clear outlines of production.

Keywords: political economy, digital video game, independent, game industry, AAA

1. Introduction

Possession of electronic households is in rise since it perceived within definition of modernization. With the increasing amount of availability of electronic devices such as mobile phones, tablets, computers, and gaming consoles, digital video game grown up to become an industry which reaches to every segment of society. As in every medium that has reached to segments of society becomes an area to be conquered and controlled by the corporations, digital video game industry is a new territory that systems of production is getting formed by them.

The developer, publisher, distributor, and retailer were four key actors that held by corporations for a time, but meaning and structure of them are shifting with the speed of technological advances.

Developers segmented into two group, where one is professional developers who develops AAA titles with highest budgets & promotions, and holds professional agreements with publishers, retailers, and distributors. Second segment is independent developers, which develops video games without the financial support from publisher in general. Definition of the independent game term is still an ongoing discussion within literature with other terms such as AAA, mainstream, video game, etc. Maria & Pawel proposes three separate types of independency in their article: (a) Financial independence that constituted by the developer & investor relation, (b) Creative independence that constituted by the developer & intended audience relation, and (c) Publishing independency that constituted by the developer & publisher relation (2016). Even though there are different combinations of independent products and developers within industry, all of those combinations fall under categories proposed above.

1.1. Significance of Topic

In search of *"what innovation is in the realm of games"*, Kati Alha defines five major aspects to outline a guide whether a game is innovative or not: (a) Being familiarly new rather than completely new (game compared to existing games). (b) Overall quality of the game, which well enough in more than one area (game as such). (c) Influences of cultural, economic, political events and timing within the environment (context). (d) Not necessarily on sales, but widely distributed (reception). (e) Attract follower developments and affect them (influence) (Alha, 2012, p. 3).

Game development is costly in terms of time and money like movie industry, sometimes bigger than that nowadays. Trying new ideas and being creative without knowing its success probability directs developers to produce AAA games, repetitions of sale-proven titles within the industry without any risk. Publishers and distributors profit-based concerns direct them to support AAA games too. In summary of this process, innovation becomes expensive factor and it is the foundation of the independent development.

Success in only one major aspect from list above do not define a game as innovative. Within that research, *"the game that is ultimately remembered as bringing something new to the industry is usually not the first of a kind"* (Alha, 2012, p. 4) statement becomes a key point that defines the problem of nowadays industry. In the procedure mainstream development that employed before rise of independent development, innovative ideas from not-so-successful games collected and developed by corporations as an AAA game and presented to market within the consideration of all five major aspects Kati Alha listed. Especially that kind of product is not accidental, it presented to the market with a plan where all key actors settle beforehand and it is a result of a serious work.

However, key actors and the procedure within digital video game industry is changing, and this research is aiming to understand how power structures take their place within this changing model.

1.2. Literature Review

When James Gee was analyzing video game industry in 2008, he stated that digital games are new form of popular cultures, and he warned that no one should mistake their present state for their potential in the context of a diverse array of new technologies, designers, players, and learning and playing situations (Gee, 2008, p. 198). We are experiencing that future where its potential shows a resistance against capitalist structures in terms of power relations. Major resistance sourced in the desire of innovation that developers wished to perform but corporations never permit. It is very unfortunate that independent products were an abundant resource of approved ideas for professional developers. In his guest column, Dan Scherlis focuses into the cloning issue that corporate publishers practice: *"they copy innovative games while changing artwork, text, and titles just enough to avoid infringing copyright law.*" (Scherlis, 2012)

New era of free production tools and digital distribution provides advantage to independents to develop innovative ideas. In 2010, independent game development company named *Wolfire Games* offered six independent games within a bundle which price would determine by purchaser, percentage of the amount would go to charities. Within purchaser determined price system, there was a slider for the purchaser to decide the percentage of the amount they wish to send developer, charity etc. Within the first week, this offering raised more than a million dollar for developers and *Humble Bundle* became an independent distribution platform where every month they bundle different independent games and kept support for charities (Humble Bundle Company Information, 2016). This offering was challenging the economic understanding of the game industry; on the other hand, that event represented major signals for the whole industry to switch from physical distribution to digital distribution. This is a brief explanation of how AAA developers began to provide digital distribution systems.

While Christiansen explains the history of independent game development as a movement and resistance to dominant mainstream discourse, he mentions that perhaps the greatest contributions to the independent developer community have been from developers who have created entire game engines and then released them as open source projects (Christiansen, 2013, p. 128). Game development was

already required intense knowledge of programming, but developing a game engine was required much higher time and knowledge than that. This *open sourced game engine* idea boosted independent developer's production and became another way of profit for AAA developers where they began to open licensing features for game engines that they develop and use for their own games.
Acquisitions of small companies by corporations and merge activities are another result of those changes. Martin & Deuze were able to see the rise of independent development in part as the result of an increasing global economy, fueled by the rise and availability of free and easy-to-use development and distribution technologies, and they argue this as alienation between producer, product, and consumer from traditional Marxist viewpoint (Chase Bowen Martin, Mark Deuze, 2009, p. 292). Market's global structure is getting more company concentrated while they create corporate synergy, which means alternative ways of economic and technologic profit for corporations with merging and acquisition (Hardy, 2014, p. 90). Those corporate actions cost billions of dollars where only ideas and copyrights traded. It is important to remember that all major console manufacturers set the sale price of devices lower than production cost and accept an economic loss in expectancy of profit within long run via game sales of future (Nichols, 2013, p. 27). Corporations acquisition considered within such long-term expectations, even its cost is higher than profit in short term.

1.3. Research Objectives

Acceptance and usage of those mentioned tools and systems could observed as fast adaptation to changes within key actors. Independent game development rooted by an idea that against mainstream corporation. This is why it is important to remember the discourse and keep questioning the political economy of production and distribution tools to be able to identify power relations.
This research investigates these questions:

1. Are free game engines free to independent developers?
2. Is there any company concentration within key actors of digital distribution services?
3. What is the concentration of independent development and acquisitions in the market?

As result of this research, we will have a detailed understanding about answers to all three questions, and this will provide us the possibility to anticipate future of game development.

2. **Methodology**

A mixed method of qualitative and quantitative approaches used together in order to develop sufficient answer for research questions. Production tool and distribution system owners do not share their data or statistics in transparency. Laws and regulations that do not force those companies for being transparent is another aspect of the issue, which is worth to mention at this point. Their available & accessible data, consultant reports, and market research used together in order to develop consistency. Researchers' long-term participant observation of 15 years was another essential source of information in this research. Journal articles, online blogs, and web publications included to these observations since most of their writers are observers and participants of topic too.
Scratchware Manifesto is a manifesto that published in 2000 by video game industry workers who accuse corporate machines with suppressing creative vision and repressing innovation in order to minimize risks and increase profit. (Anonymous, 2000). Due to the sensitivity of topic and protection from the sanction of capital structures workers preferred to publish that manifesto anonymously. Their argument is a very close example to critical theorist Theodor Adorno's Culture Industry framework.

"The cultural producer, or the artist, had no real agency and that the industries produced massively homogenized goods in order to integrate people into the capitalist way of life, therefore contributing to its reproduction." (Ommen, 2016, p. 4)

When we consider AAA titles that developed and published by professional corporations, we should able to observe homogenized and reproduced goods within the industry. Since artist's agency considered as *not real* within the framework, the corporation remains as a cultural producer in essence. Richard & Anand's research on the production of culture perspective focuses on how the symbolic elements of

culture are shaped by the system, within which they are created, distributed, evaluated, taught, and preserved (Richard A. Peterson, N. Anand, 2004, p. 311). Their six facets of production are technology, law and regulation, industry structure, organization structure, occupational careers, and market. This research includes technology, law and regulation, and occupational careers facets within introduction and literature review. In the other hand, this research highly focuses on industry structure, organization structure and market within research part in order to draw clear outlines of production.

In game engines and digital distribution systems, there are hundreds of alternatives available that any developer can choose. In order to select major ones within all for keeping research sample manageable, columnists of video game development magazines, blog writers from industry, product and system reviewers, and statistical data collected together to form out of order list within best-evidence approach. This approach used to prevent cherry picking for sample.

At this point, it is important to understand that participants of industry constantly wrote blogs and online publications, which are now enlightening remains of a digital history.

2.1. Sample of Game Engines

Statistically, *indiedb.com* and *moddb.com* provides a minor difference within their *All Time Popular Engine* list even though *moddb.com*'s game engine database have 150 additional game engine in its list where totally lists 660 game engines (2017) (2017).

Mark Wilcox from *DeveloperEconomics.com* publishes four major game engines for independent developers based on their survey done within their twitter audience (Wilcox, 2014), Craig Chapple from *Develop-Online.net* publishes observations (Chapple, 2014), Rita Turkowski from *GameSpark* provides analysis and comparison of major game engines (Turkowski, 2016).

Best-evidence approach used for synthesizing from a representative sampling of web articles and statistical data and determined to consider *Unity3D*, *Unreal Engine*, *CryEngine*, *GameMaker: Studio*, *Source*, and *Construct2* game engines since they are most widely reviewed/suggested in game development area.

2.2. Digital Distribution Systems

Due to research that based on *compete.com*'s unique visitors at April 2010, *Steam* was leading distribution service with 52% score. Nevertheless, 6 year is even enough for paradigmatic change within the technological speed and there is no solid proof/statistic based data available to understand demographics of digital distribution.

With *Entertainment Retailers Association*'s research and statistical results, we are able to see that digital format sales are increased 17.1% where physical format sales are decreased -2.2% which means 2015 is the first year in history that digital share of entertainment was higher than physical share (Butler, 2016). *Steam*, *Origin*, *UPlay*, *GOG.com*, *Battle.net*, *Green Man Gaming*, and *GamersGate* appears to be most common digital distribution platforms. I conclude to focus on these seven platforms by averaging common mentions of Michael Klappenbach from *Lifewire* (Klappenbach, 2016), Henry Winchester from *TechRadar* (Winchester, 2012), Christian Bonilla from *MakeUseOf* (Bonilla, 2016), and Shamus Young from *The Escapist* (Young, 2015).

2.3. Market Concentration

In order to investigate and understand the popularity of independent ideas within market and concentration of acquisitions, analyses divided into two different part. The first part is based on *Steam*, which is the largest and most used digital distribution system that developed by *Valve Corporation. Steam*'s live and accessible statistical data is the reason for this decision. Most actively playing game data, which shows highest live active player numbers of top 100 games. Highest 10 games taken consideration and their development backgrounds investigated in order to see if there is a pattern. The second part includes analysis of recent data about biggest video game acquisitions, which data cited from Wikipedia since I personally contributed to gathering information for that page personally (Fares Ketbi, Baris Parlan, 2016).

2.4. Limitations

Statistical research reports about the digital video game industry and consultant reports prices are relatively high (above 2.000$) since they are produced for assisting technology companies with their future planning. There are no law or regulation policy, which enforces companies to be transparent about their statistical information. Therefore, this research was limited to available public information of consultant reports and statistical data.

Microsoft (Xbox), *Nintendo (Wii)*, and *Sony (PlayStation)* are major corporations that manufacture hardware within game console industry. Additionally, they all function as a developer, publisher, and distributor of digital video game industry. They are major global corporations of industry and excluded from this research as production tool and distribution service owners since they all have their own development, publishing, and distribution tools, which focuses on their own hardware platforms.

3. **Finding and Discussion**

3.1. Findings of Means of Production

In this part of research, economical limitations and royalty basis of six major game engines cited from their End User License Agreements to provide information about real prices of products.

a) Unreal Engine by Epic Games: *"You agree to pay Epic a royalty equal to 5% of all worldwide gross revenue actually attributable to each Product"* (Unreal® Engine End-User License Agreement, 2017)

b) Unity3d: *"If your company currently makes more than $100k in annual gross revenues or has raised funds in excess of $100k, you are not permitted to use Unity Personal as defined in our EULA Agreement."* (Unity Personal Software Additional Terms, 2016)

c) CryEngine by CryTech: *"The basic version of the CryTech Services can be used indefinitely and without restrictions."* (CryEngine - Terms of Service, 2017)

d) Construct2 by Scirra*: "The individual is permitted to make up to $5,000 USD lifetime revenue (or equivalent in other currencies/payments/benefits) from their creations."* (Scirra - Licensing Agreement, 2017)

e) Source Engine by Valve*: "Source engine is completely free if developers will distribute their games free. In order to earn profit from Source Engine, the developer should pay $25.000 licensing fee."* (Source Engine Games on Steam, 2017)

f) GameMaker: Studio announced to discontinue due to the release of newer version *GameMaker Studio 2*. It does not provide a free version option anymore.

3.2. Findings of Digital Distribution Systems

In this part of research, owners of digital distribution systems identified to see whether they develop or publish digital video games in addition to distribute other video games. In addition to that, information about those companies' game engines listed if any exist. It is important to mention that there is no claim, branding, or advertisement about free distribution. Six of those digital distribution systems charge various amount of share from distributions, where one of them do not distribute independent developments.

a) Steam: owned by *Valve Corporation* (game developer and publisher), developer of Source Game Engine. Source2 Engine is under development and announced that Source2 will be available for free to content developers.

b) Origin: developed and owned by Electronic Arts (game developer and publisher), developer of two proprietary game engines that not on sale or open to the public: Ignite and Frostbite.

c) UPlay: owned by Ubisoft Entertainment (game developer and publisher), developer of the proprietary game engine: Anvil.

d) GOG.com: owned by CD Projekt (game developer and publisher), developer of the proprietary game engine: REDengine.
e) Battle.net: owned by Activision-Blizzard (game developer and publisher), developer of proprietary game engines. Used Unity3d (free game engine) for “Hearthstone” game.
f) Green Man Gaming: Worldwide serving online video game retailer. Additionally provides game publishing service and have no game development function.
g) GamersGate: Worldwide serving online video game retailer. Even though developed by Paradox Interactive (game developer and publisher), they divide distribution service as a separate company to make it more “independent” and equal for all other developing and publishing partners.

3.3. Findings of Company Concentration over Steam

Table 1 is showing concurrent active player of each game on Steam. The number of active user changes during day/night shifts and games may switch positions between each other but main importance of graph remains solid when we group those games as AAA and Independent products. Respective numbered paragraphs are explanations about development background of each title in this list in order.

CURRENT PLAYERS	PEAK TODAY	GAME
424,809	901,129	Dota 2
381,215	661,144	Counter-Strike: Global Offensive
60,281	111,545	Grand Theft Auto V
58,199	74,413	ARK: Survival Evolved
55,162	73,690	Team Fortress 2
53,142	70,446	Football Manager 2017
48,707	63,941	Rocket League
45,385	59,780	Rust
43,935	63,107	Garry's Mod
43,797	49,557	Sid Meier's Civilization V

Table 1 - Steam's live active player stats of 2017 Jan 09.

1. Original DotA was a game modification done by players at their homes over another AAA production *Warcraft III* by Blizzard Entertainment. DotA’s intellectual property rights acquired by Valve Corporation in 2009 to develop a sequel for it named DotA 2.
2. Counter-Strike is another game modification done by players, over an AAA production *Half-life* by Valve Corporation in 1999. Games intellectual property rights acquired by Valve Corporation and they produce 7 official Counter-Strike games. *Counter-Strike: Global Offensive* is one of them.
3. *Rockstar Games* developed first *Grand Theft Auto* (GTA) in 1997, and within 20 years, 15 different / sequel *GTA* games developed for various platforms.
4. *ARK: Survival Evolved* was a game developed by *Studio Wildcard* in co-operation with *Instinct Games*, *Efecto Studios*, and *Virtual Basement*. *ARK* was company’s first game and developed with *Unreal Engine*.
5. *Team Fortress* was a game modification done by players in 1996. *Valve Corporation* developed and published *Team Fortress Classic* version in 1999 and *Team Fortress 2* in 2007.
6. *Football Manager* firstly developed in 2005 by *Sports Interactive* and published by *Sega*. From that, date game repeatedly developed 12 times every single year, excluding some other platform versions.

7. Psyonix, an independent video game development company that uses *Unreal Engine* technology, develops *Rocket League*. They provide support to big game development titles independently.
8. *Facepunch* is an independent video game development company who employees only 20 people and developed both *Garry's Mod* and *Rust*, 8th and 9th most played games in the *Steam* list.
9. *Civilization* is a game firstly developed in 1991 by *Sid Meier* while his co-founded company *MicroProse*. After that company's acquisition, *Meier* formed a new company named *Fraxis* and kept developing *Civilization* as series with many other games. From 1991 until today, 13 different *Civilization* game developed, 6 of them was sequels.

1	DotA 2	Mod - Acquired to AAA - 2 Sequels
2	Counter Strike: G.O.	Mod - Acquired to AAA - 7 Sequels
3	Grand Theft Auto V	AAA - 15 Sequels
4	ARK: Survival Evolved	Co-Developed - Unreal Engine
5	Team Fortress 2	Mod - Acquired to AAA - 2 Sequels
6	Football Manager 2017	AAA - 12 Sequels
7	Rocket League	Independent - Unreal Engine
8	Garry's Mod	Independent - Source Engine
9	Rust	Independent - Unity Engine
10	Civilization V	AAA - 13 Sequels

Table 2 - 10 Most Actively Played Steam Games & Production Info

3.4. Findings of Company Acquisitions

It is important to notice that acquisitions between developers, publishers, and distributors topped $25 billion from beginning of 2016 until July 2016 up to *Digi-Capital*'s research reports (Games acquisitions top $25 billion to July 2016, 2016). Here is the list of most expensive video game acquisitions of all times:

- *Supercell*, the developer of *Clash of Clans* game was a development studio with 180 workers. Relatively small, where its major competitor was King Digital with 1,400 workers. Chinese company *Tencent Holdings*, which has minor stakes in *Epic Games* (Owner of Unreal Engine) and major stakes in much other game and technology industry, acquired Supercell in 2016 for $8.6 billion.
- *King Digital*, the developer of *Candy Crush* game acquired by *Activision-Blizzard* in 2016 for $5.9 billion.
- *Mojang*, the developer of *Minecraft* was a self-made independent studio. *Microsoft* acquires *Mojang* for $2.5 billion in 2014, and three founders of Mojang left the company.
- *Oculus* was an independent company established two months prior to *Kickstarter* campaign in the promise to develop virtual reality headset. The successful project raised $2.5 million. *Facebook* acquired Oculus for $2 billion in 2014.

We can observe that three out of four companies are independent, especially within the definition that established in the beginning of research.

3.5. Discussions

In terms of game engines as production tools, all companies except *CryEngine* announce and promotes their game engine as free to support independent developments, but they force royalty within specific

circumstances. Those circumstances mostly related with income of the project, which enforces the developer to share a percentage of the profit with game engine producer if they earn more than specified amount of income. Calling a product free within written rules is a branding technique of product, which announced with intention to democratize game development. This information should be accounted by the independent developer and future bindings should considered before development (Amber Rowland, Chris Clarke, 2011). It is important to note down that this model became popular within many other game engine providers, and actually, they should be marked down as a new dominant power within the industry.
Within seven digital distribution services, *Green Man Gaming* is the only retailer that have no development or publishing interest, and *GamersGate* has no development but publishing service. Six major digital distribution systems (Steam, Origin, UPlay, GOG.com, Battle.net, GamersGate) developed by game publishers to distribute their own games, and five of them (Steam, Origin, UPlay, GOG.com, GamersGate) opened their systems to other publishers as distribution service in return of profit share by percentage. It is important to understand that those service owners are already mainstream game development and publishing companies. This profit share based agreement means opportunity for independent developers since they use a free distribution service in return. Physical distributions disadvantages make it obsolete against digital distribution, and this process makes digital distribution systems another new dominant power in an industry that takes share from the profit of independent developers.
In analyze of *Steam's* Current Active Player data by its titles, we observe that three games are completely independent production, one co-developed which makes four games out of ten using game engines that contained by this research. Remaining three games are AAA productions of professional developers that do not prefer to innovate new things to avoid risks. That decision leads them 13 sequels per game on average. If we include all acquired games by professional developers to calculation, we end up 9 sequels game per title on average.
The last step of this process within game industry is to acquire the suitable independent company and make it an asset of global corporation in order to maintain profit in future. Especially last two acquisitions are virtual reality technology related examples, which means hundreds of independent developers preparing projects about it, and corporations are clearly harvesting successful ones by providing them means of production.

4. Conclusion and Further Suggestions

4.1. Conclusion

This research was giving analysis of corporations within digital video game industry. Free game engine idea as branding technique and comfort of digital distribution systems simply directing independent developers to try innovative ideas within their initiatives. Independent developers should consider real offering underlying this system because providing production tools such as game engines for development is a new way of free research & development solution for corporations. This very same situation is valid for distribution too. Those are supportive developments from corporations to the independent developer to innovate new ideas and experiment them on market. Corporations will take share from projects; even project can acquired depending on its success rate. At this perspective, independent development becomes exploited risk-free research & development service for corporations. When we consider corporation concentration within the industry, mainstream dominant structures keeping pace with new technology to establish their control.
Very similar progress can observe in the movie industry, music industry, and book industry. Within technological advancement that affects means of production and distribution systems, corporations put themselves in a place where makes them able to share from a profit of developers.

4.2. Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

4.3. Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

REFERENCES

Maria B. Garda, Paweł Grabarczyk. (2016). Is Every Indie Game Independent? Towards the Concept of Independent Game. *The International Journal of Computer Game Research , 16* (1).

Aliyu, A. A., & Tasmin, R. (2012). The Impact of Information and Communication Technology on Banks‟ Performance and Customer Service Delivery in the Banking Industry. *International Journal of Latest Trends in Finance and Economic Sciences , 2* (1), 80-90.

Turan, O. (2006). *Bilgisayar Ağları ile İlgili Suçlar (Siber Suçlar).* Retrieved 2016 from T.C Kalkınma BakanlığıBilgitoplumu: http://www.bilgitoplumu.gov.tr/wp-content/uploads/2015/01/Bilgisayar_Aglari_ile_ilgili_Suclar_OguzTurhan.pdf

Gorgieva-Trajkovska, O. (2009). Електронско банкарство - поим и ризици . *Годишен зборник, Економски факултет* , 162-172.

(n.d.).

Unity Personal Software Additional Terms. (05 de 11 de 2016). From Unity: https://unity3d.com/es/legal/terms-of-service/software

United Nation Genral Assembly. (22 de January de 2001). *55/63. Combating the criminal misuse of information technologies.* Retrieved 2016 from International Telecominications Union: https://www.itu.int/ITU-D/cyb/cybersecurity/docs/UN_resolution_55_63.pdf

United Nations . (2010). *General Assembly resolution 65/230 Twelfth United Nations Congress on Crime Prevention and Criminal Justice .* Retrieved 2016 from United Nations office on Drugs and Crime: https://www.unodc.org/documents/justice-and-prison-reform/AGMs/General_Assembly_resolution_65-230_E.pdf

UNMICT. (n.d.). *Legacy website of the International Criminal Court for Rwanda*. From http://unictr.unmict.org/

Unreal® Engine End-User License Agreement. (07 de 01 de 2017). From Unreal® Engine: https://www.unrealengine.com/eula

Wilcox, M. (16 de September de 2014). *Top Game Development Tools: Pros and Cons*. From Developer Economics: https://www.developereconomics.com/top-game-development-tools-pros-cons

Winchester, H. (24 de January de 2012). *5 Best Game Download Services*. From TechRadar: http://www.techradar.com/news/computing/pc/5-best-game-download-services-1049981

Young, S. (12 de May de 2015). *The Digital Distribution Wars Are On Again*. From The Escapist: http://www.escapistmagazine.com/articles/view/video-games/columns/experienced-points/13908-The-Digital-Distribution-Options-Available-And-How-They-Rate

Advanced persistent threat (APT). (2016). From TechTarget: http://searchsecurity.techtarget.com/definition/advanced-persistent-threat-APT

African Commission on Human and Peoples Rights. (n.d.). *African Court on Human and Peoples Rights*. From http://www.achpr.org/about/afchpr/

African International Courts and Tribunals. (n.d.). From www.aict-cita.org: http://www.aict-ctia.org/courts_subreg/amu/amu_home.html

Alha, K. (2012). The Concept of Game Innovation: The History of Winners. *Games and Innovation Research Seminar 2011 Working Papers* , pp. 8-12.

All Time Popular Engines. (06 de 01 de 2017). From IndieDb: http://www.indiedb.com/engines?sort=visitstotal-desc

All Time Popular Engines. (06 de 01 de 2017). From ModDb: http://www.moddb.com/engines?sort=visitstotal-desc
Anonymous. (2000). *The Scratchware Manifesto.* From Home of the Underdogs: http://www.homeoftheunderdogs.net/scratch.php
Amber Rowland, Chris Clarke. (20 de July de 2011). *Unity Technologies Lands $12 Million in Series B Funding Led by WestSummit Capital and iGlobe Partners*. From MarketWired: http://www.marketwired.com/press-release/unity-technologies-lands-12-million-series-b-funding-led-westsummit-capital-iglobe-partners-1540593.htm
Amnesty International. (2016). *Amensty International Online* .
Butler, L. (2016). *ERA Yearbook 2016.* From Entertainment Retailers Association: http://www.eraltd.org/insights/era-yearbook/
Beckman, R., & Butte, D. (n.d.). *Introduction to International Law* . Retrieved 2016 from International Law Student Organisation: https://www.ilsa.org/jessup/intlawintro.pdf
Bonilla, C. (22 de April de 2016). *Tired of Steam? Here Are the Best Alternative Gaming Clients* . From MakeUseOf: http://www.makeuseof.com/tag/tired-steam-best-alternative-gaming-clients/
Cybercrime. (2015). Retrieved 2016 from Interpol: https://www.interpol.int/Crime-areas/Cybercrime/Cybercrime
Cybercrime. (2016). Retrieved 2016 from TechTarget: http://searchsecurity.techtarget.com/definition/cybercrime
Cybercrime. (2016). Retrieved 2016 from Europol: https://www.europol.europa.eu/crime-areas-and-trends/crime-areas/cybercrime
Chapple, C. (30 de April de 2014). *The Top 16 Game Engines for 2014*. From Develop-Online.net: http://www.develop-online.net/tools-and-tech/the-top-16-game-engines-for-2014/0192302
Chase Bowen Martin, Mark Deuze. (2009). The Independent Production of Culture: A Digital Games Case Study. *Games and Culture , 4* (3), 276-295.
Christiansen, P. A. (2013). *Breaking Out Of The Industry: The Independent Games Movement As Resistance To Hegemonic Videogame Discourse.* Doctoral Dissertation, The University of Utah, Department of Communication, Utah.
Council of Europe. (2001). *Treaty no 185 Convention on Cybercrime.* Retrieved 2016 from Council of Europe: https://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/185
Cole, R.J.V. (2013). Africa's relationship with the International Criminal Court: More political than legal. *Melbourne Journal of International Law , 14*, 670.
CryEngine - Terms of Service. (06 de 01 de 2017). From CryEngine: https://www.cryengine.com/terms
ECOWAS. (2012). From www.courtecowas.org: http://www.courtecowas.org/site2012/index.php?option=com_content&view=article&id=2&Itemid=5
Definition of E-Banking. (2016). From FFIEC IT Examination HandBook InfoBase: http://ithandbook.ffiec.gov/it-booklets/e-banking/introduction/definition-of-e-banking-
DRC v Belgium. (2002).
Fares Ketbi, Baris Parlan. (2016). *List of most expensive video game acquisitions*. Retrieved 16 de January de 2017 from https://en.wikipedia.org/wiki/List_of_most_expensive_video_game_acquisitions

Gaumer, Q., Mortier, S., & Moutaib, A. (2016). Financial Institutions and cyber crme – Between vulnerability and security. *Financial Stability Review,* (20).
Games acquisitions top $25 billion to July 2016. (July de 2016). From Digi-Capiral: http://www.digi-capital.com/news/2016/07/games-acquisitions-top-25-billion-to-july-2016/
Gbrerie, L. (n.d.). The Special Court for Sierra Leone rests for good. From http://www.un.org/africarenewal/magazine/april-2014/special-court-sierra-leone-rests-%E2%80%93-good
Gee, J. P. (2008). Learning Theory, Video Games, and Popular Culture. In S. L. Kirsten Drotner, *International Handbook of Children, Media and Culture* (pp. 196-213). London: SAGE.
ICC. (2016). *The States Parties to the Rome Statute* .
ICC. (2016).
ICTR Brief. United Nations Mechanism for Internationl Criminal Tribunals.
International Justice Resource Centre. (n.d.). South African Development Community Tribunal. From http://www.ijrcenter.org/regional-communities/southern-african-development-community-tribunal/
Imoedemhe, O. (2015). Unpacking the tension between the African Union and the International Criminal Court: The way forward. *African Journal of International and Comparative Law* , 74.
(2013). *Human Security Report 2013.* Human Security Report Project.
Humble Bundle Company Information. (2016). Retrieved 18 de January de 2017 from http://jobs.humblebundle.com/company/
Haselmann, R., & Vig, V. (2007). *and Vikrant Vig, "The Differential of Bank Liberalization",*. From Bundesbank: https://www.bundesbank.de/Redaktion/EN/Downloads/Bundesbank/Research_Centre/Conferences/2007/2007_06_21_eltville_01_haselmann_vig_paper.pdf?__blob=publicationFile
Hardy, J. (2014). *Critical Political Economy Of The Media: An Introduction.* New York: Routledge.
Jalloh, C.C. (2011-2012). Africa and the International Criminal Court: Collision course or cooperations? *North Carolina Central Law Review , 34*, 203.
Keçeci, O. (2012). *Siber Suçlar ve Terörizm.* Retrieved 2016 from Academia: http://www.academia.edu/2333087/Siber_Su%C3%A7lar_ve_Ter%C3%B6rizm
Kessem, L. (18 de August de 2015). *Gozi Goes to Bulgaria — Is Cybercrime Heading to Less Charted Territory?* . Retrieved 2016 from SecurityIntelligence: https://securityintelligence.com/gozi-goes-to-bulgaria-is-cybercrime-heading-to-less-chartered-territory/
Klappenbach, M. (01 de November de 2016). *Top PC Game Digital Download Services*. From Lifewire: https://www.lifewire.com/top-pc-game-digital-download-services-813065
Lupu, V. (13 de August de 2015). *Malware designed to attack 12 banks in Romania exclusively, revealed by IBM*. Retrieved 2016 from The Romania Journal.
Levin, A., & Ilkina, D. (2013). *Ryerson University Privacy and Cyber Crime Institute.* Retrieved 2016 from Ryerson University: http://www.ryerson.ca/tedrogersschool/privacy/documents/Ryerson_International_Comparison_ofCyber_Crime_-March2013.pdf
Levitt, T. (May de 1983). *The Globalization of Markets.* From Harvard Business Review, : https://hbr.org/1983/05/the-globalization-of-markets

Nam, J.F.W. (2015-2016). Jurisdictional conflicts between the ICC and the African Union: Solution to the dilemma. *Denver Journal of International Law and Policy , 44*, 41.
NATO. (2016). *Cyber defence*. Retrieved 2016 from NATO: http://www.nato.int/cps/en/natohq/topics_78170.htm#
Nichols, R. (2013). Who Plays, Who Pays? Mapping Video Game Production and Consumption Globally. In N. Huntemann, & B. Aslinger, *Gaming Globally: Production, Play, and Place.* New York: Palgrave Macmillan.
Mudukuti, A. (2012). South Africa abandoning the International Criminal Court? The build up and potential consequences. *European Human Rights Law Review* , 1.
Maria B. Garda, Pawel Grabarczyk. (2016). Is Every Indie Game Independent? Towards the Concept of Independent Game. *the international journal of computer game research , 16* (1).
Mills, K. (2012). "Bashir is dividing us": Africa and the International Criminal Court. *Human Rights Quarterly , 34*, 404.
Ommen, M. v. (2016). Guild Wars 2, the Frankfurt School and Dialectical Fairy Scenes: A Critical Approach Towards Massively Multiplayer Online Video Games. *Games and Culture* , 1-21.
Prosecutor v Charles Ghankay Taylor. (31 de May de 2014). *Case No SCSL-2003-01-I Appeleas Chamber of the SCSL* , par 52.
Protocol on the Amendments to the Protocol of the ACJHR. (2014). *The 23rd Ordinary Session of the African Union Malabo* .
Sarkin, J. (2009). The role of the United Nations, the African Union and Africa's sub-regional organisations in dealing with Africa's human rights problems: Connecting humanitarian intervention and the responsibility to protect. *Journal of African Law* , 1.
Scirra - Licensing Agreement. (06 de 01 de 2017). From Scirra: https://www.scirra.com/store/licensing#license2
Scherlis, D. (9 de March de 2012). *Guest column: Don't clone my indie game, bro*. From Digital Media Wire: http://digitalmediawire.com/2012/03/09/guest-column-dont-clone-my-indie-game-bro/
SCSL. (n.d.). *The Special Court for Sierra Leone its history and jurisprudence.* From http://ww.rscsl.org
Sluiter, G. (2005). VI International Criminal Court (ICC). *Netherlands Quarterly of Human Rights , 23*, 480.
Source Engine Games on Steam. (07 de 01 de 2017). From SteamWorks: https://partner.steamgames.com/documentation/source_games
Stories. (2016). From Kaspersky Lab: https://www.kaspersky.com/about/stories/news~2Fvirus~2F2015~2FCarbanak-cybergang-steals-1-bn-USD-from-100-financial-institutions-worldwide%20
Rwanda Clarification. (2016). From Ministry of Justice Rwanda: http://www.minijust.gov.rw/fileadmin/Documents/Photo_News_2016/Clarification2.pdf
Richard A. Peterson, N. Anand. (2004). The Production of Culture Perspective. *Annual Review of Sociology , 30*, 311-334.
Turkowski, R. (06 de April de 2016). *Game Engine Analysis*. From GameSparks: https://www.gamesparks.com/blog/game-engine-analysis/

The Organisation for Economic Co-operation and Development. (2016). Retrieved 2016 from https://www.oecd.org/
Treaty of the Economic Community of West African States. (1975).