

ARMeet:
Report visualization tool for
Augmented Reality

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Introduction

This project report contains information and knowledge of a dataset for video game sales ranging from the early 80's to 2016. The idea of this report itself is to also serve as a platform to visualize through augmented reality the data contained in the report.

This report was developed in conjunction with a mobile app called ARMeet; *ARMeet* is an app used to easily visualize information contained in reports shared in meetings, ARMeet lets the user compare visualizations just by placing an extra label next to each image at the end of each chapter.

ARMeet was build because it's critical for everyone in a meeting to understand what a report contains. And the faster this task is achieved the better as users are able to make questions about the data contained in the report instead taking the time to understand the data itself in the meeting.

With the help of Augmented Reality, ARMeet aims to ease the understanding of the data contained in the report and to some extent, it will let the users compare information in it. The knowledge in the report pages is able to be visualized through a smart phone using the report pages themselves as anchor points to draw the data it contains.

In this report we are going to visualize a dataset called Video Game Sales from *Kaggle*[3]. This dataset contains sales from 1980 throughout 2016 from different video game consoles and their respective platforms. Each game contains sales dissected from US, Europe, Japan and other countries.

This project is built in Vuforia[2] which takes care of the Augmented Reality part in conjunction with Unity3D[1] for the rendering side.

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1 The Data

The data that is used in this project comes from the Kaggle webpage, specifically the *Video game sales and ratings* dataset[3]. This data comes in a csv file with the following fields:

Name, Platform, Year_of_Release, Genre, Publisher, NA_Sales,
EU_Sales, JP_Sales, Other_Sales, Global_sales, Critic_score,
Critic_count, User_score, User_count, Developer, Rating

From these fields, Critic_score, Critic_count, User_score and User_count where discarded as only 6900 out of 16720 games are complete.

From the data processed, 6 Major consoles where extracted and a total of 31 platforms from all the consoles where found.

1.1 The games

As mentioned, there are a total of 16720 games; these games where parsed and separated by their respective consoles and console platforms.

Each game belongs to a major console and a specific platform within the console, the games are organized as a 3D column with different colors; on the bottom of the column there is a blue color which represents the sales if US; then there is a yellow color wich represents the sales in europe, next is a red color which represents the sales in Japan and finally a white color that represents the sales in other countries.

If one of these colors lacks in the 3D image; it means that there are no registered sales in that country. Finally, along all the colors there is a purple cylinder that covers all the sales across all the countries; this color represents the total sales of that game.

1.2 Consoles

As mentioned, 6 Major consoles were extracted from the data; each console contains a set of platforms where every game belongs to. The extracted consoles are: Nintendo, Sony, Microsoft, SEGA, PC and Other consoles.

The ***Other*** console, groups all the smaller platforms that don't have a renowned vendor.

Finally each of these consoles are discussed with more detail in later sections of this report with all the platforms each of them has along with their most significant game sales.

1.3 The platforms

There are a total of 31 platforms; each platform serves as a way to group games and also helps minimizing the amount of data that needs to be shown at the same time.

Some platforms contain more games than others and every platform belongs to a console. The platforms to be visualized are organized as follows:

- 1. Nintendo:** Nintendo Entertainment System, Super Nintendo, Gameboy, Gameboy Advance, Nintendo DS, Nintendo 3DS, Nintendo 64, Game Cube, Wii and Wii-U.
- 2. Sony:** Playstation, Playstation 2, Playstation 3, Playstation 4, Playstation Portable (PSP) and Playstation Vita.
- 3. Microsoft:** Xbox, Xbox 360 and Xbox One.
- 4. SEGA:** Sega Saturn, Sega CD, Sega Genesis, Sega Gamegear and Sega Dreamcast.
- 5. PC:** PC.
- 6. Other:** Atari 2600, Wonder Swan, Neo Geo, Turbo Grafx 16, Panasonic 3DO and NEC PC-FX.

2 Nintendo

Nintendo is a Japanese multinational consumer electronics and video game company headquartered in Kyoto, Japan. Nintendo is one of the world's largest video game companies by market capitalization. Founded on 23 September 1889 by Fusajiro Yamauchi[4].

Nintendo is one of the 6 main consoles analyzed in this report; it has 10 platforms (mobile and house-only). and is one of the most known video game consoles. Each platform has several games and has one *iconic* game that has the most sales, the platforms discussed with their respective games are:

2.1 Nintendo Entertainment System (NES):

The platform is an 8-bit console initially released in Japan as the Family Computer in 1983, 1985 in US and between 1986-1987 in Europe.[4]. According to the data, there are registered 98 games for this platform; for a total sales of \$251.07 million dollars. The most significant games are *Mario Bros*, *Duck Hunt* and *Mario 3*.

2.2 Super Nintendo (SNES):

This was a 16-bit video game console, which was released in North America in 1991, and in Europe in 1992. The console was initially released in Japan in 1990[4]. The most representative game for this platform is *Super Mario World*, released in 1990 with total sales of \$20.61 million dollars.

2.3 Gameboy:

Released in Japan on 21 April 1989, and in North America on 31 July 1989[4]. It got a total sales of 255.45 million dollars with 98 games released in total. The most representative games for this platform where *PokemonRed/Blue* with a total sales of 31.37 million dollars, *Tetris* (1989) with a total sales of \$30.26 million dollars and *pokemon gold / silver* with \$23.1million dollars in 1999.

2.4 Nintendo 64:

Released in 1996, it featured 3D polygon model rendering capabilities and built-in multiplayer for up to four players[4]. This platform accounted \$218.88 million dollars in total sales spread in 319 released games. Its most representative game is *Mario 64*, published by Nintendo itself with total sales of \$11.89 million dollars.

2.5 Gameboy Advance:

Introduced in 2001 as a redesigned version of the Gameboy[4]. The most representative game for this platform is *Pokemon Ruby / Sapphire*, with a total sales of \$15.85 million dollars in 2002.

With 822 games released for this platform; the total sales where just 24% more than the Gameboy according to the data for \$318.5 million dollars in total sales.

2.6 GameCube:

released in 2001, in Japan and North America, and in 2002 worldwide. Its the successor of the Nintendo 64 and competed with Sony's PlayStation2, Microsoft's Xbox and SEGA's Dreamcast[4]. The GameCube managed to get a total sales of \$199.36 million dollars with 556 games. Sales wise it did worse

than its predecessor the Nintendo 64. The 3 most representative games sales wise are *Super Smash Bros Melee* (2001) with a total sales of \$7.07 million dollars, *Mario Kart: Double Dash* (2003) with \$6.95 million dollars in total sales and *Super Mario Sunshine* with \$6.31 million dollars in 2002.

2.7 Nintendo DS:

In 2004, Nintendo released the Nintendo DS, its fourth major handheld system. The DS is a dual screened handheld featuring touch screen capabilities[4]. These novel features account for the great total grand sales of \$807.1 million dollars from 2152 released games. Its the platform under Nintendo with the most games released. The most representative game is *New Super Mario Bros* which got released in 2006 accounting for sales of \$29.8 million dollars. Other relevant games are Mario Kart DS with \$23.21 million dollars in sales and *Nintendogs* with \$24.67 million dollars in sales.

2.8 Nintendo 3DS:

This platform was an attempt to further expand the Nintendo DS line, the Nintendo 3DS uses the process of autostereoscopy to produce a stereoscopic three-dimensional effect without glasses. The 3DS got off to a slow start, initially missing many key features but price cuts and game releases helped to boost the 3DS sales. In August 2013, the 3DS was the best selling console in the United States for four consecutive months. The total sales of this platform was \$259.1 Million dollars; Representative games for this platform are *Pokemon X/Y* (2013) with \$14.6 million dollars in sales and *Mario Kart 7* in 2011 with \$12.66 million dollars.

2.9 Nintendo Wii:

The Wii was released during the holiday season of 2006 worldwide. The system features the Wii Remote controller, which can be used as a handheld pointing device and which detects movement in three dimensions. Another notable feature of the console is WiiConnect24, which enables it to receive messages and updates over the Internet while in standby mode. It also features a game download service, called "Virtual Console", which features emulated games from past system.[4]. This is the console from Nintendo that has the most sales; it sold in total \$908.13 million dollars with 1320 games that belong to this platform. *Wii Sports* is the most prominent game with \$82.53 million in sales followed by *Mario Kart wii* with \$35.52 million.

2.10 Nintendo Wii U:

The Wii U is the successor to the Wii, it was released during the holiday season of 2012 worldwide. The Wii U is the first Nintendo console to support high-definition graphics. The Wii U's primary controller is the Wii U GamePad, which features an embedded touchscreen. The system supports most Wii controllers and accessories[4]. In contrast with the Wii; the Wii U was a total failure. Up until 2016 it has 147 games and only sold \$82.16 million dollars.

In conclusion the best selling platform Nintendo has had is the Wii with a total of \$908 million dollars in sales followed by the Nintendo DS with \$807 million dollars. The most relevant game across the whole nintendo Brand is Mario and sometimes is has the game that sells the most in its platform. For more info on all the games each platform has, point *ARMeet* to Figure2.1 to see each platform detailed sales.

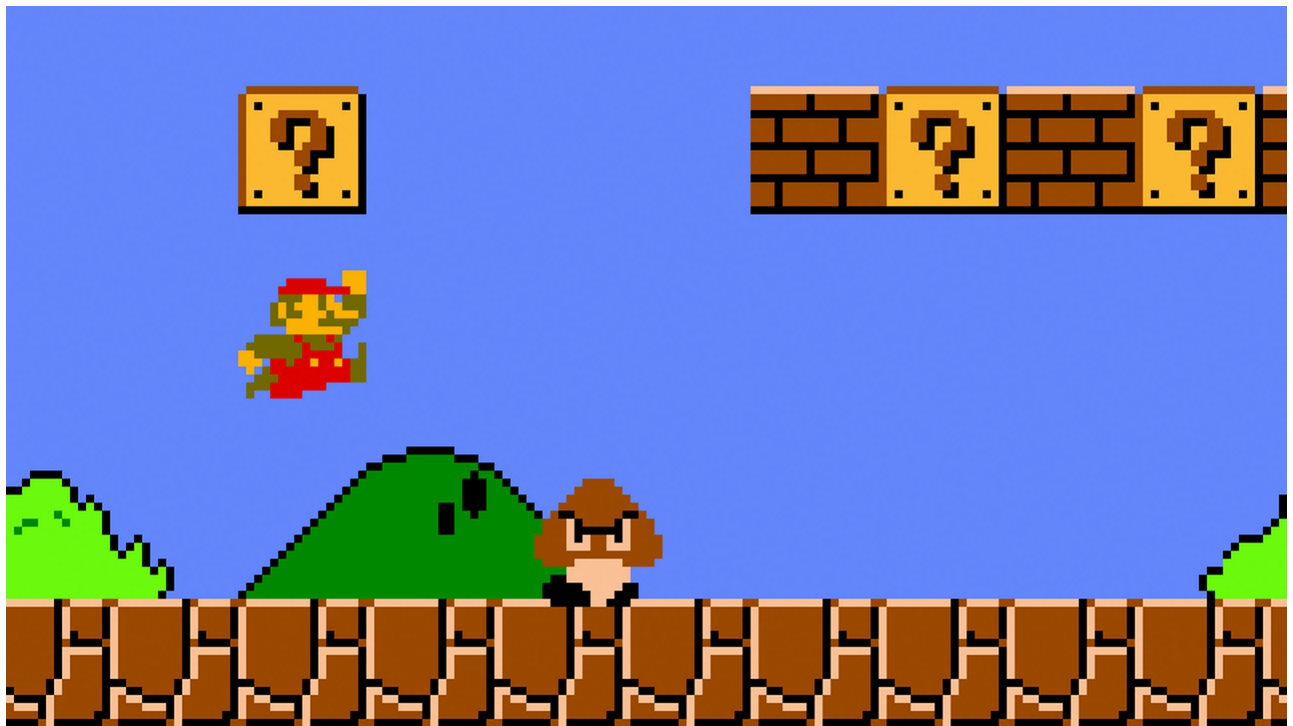


Figure 2.1: Representative picture of Nintendo, point ARMeet to this image to see the different sales on each platform.

3 Sony Interactive Entertainment

Sony Interactive Entertainment (abbreviated as SIE and formerly known as Sony Computer Entertainment Inc. (SCEI) and Sony Network Entertainment) is a multinational video game company and is an owned subsidiary and part of the Consumer Products and Services Group of Sony.

The company was founded and established on November 16, 1993, as Sony Computer Entertainment, to handle Sony's venture into video game development. Since the successful launch of the original PlayStation console in 1994, the company has since been developing the PlayStation lineup of home video game consoles and accessories[5].

3.1 Playstation:

The PlayStation was released in Japan on December 3, 1994, and later in North America on September 9, 1995[5]. Games in this platform go from 1994 to 2003. According to the data the platform contains 1197 games and holds \$730.68 million dollars in sales across these years. On this platform the game with most sales is *Gran Turismo*, released in 1997 with \$10.95 million dollar sales worldwide. Followed by *Final Fantasy VII* (1997) with \$9.72 Million dollars and *Gran Turismo 2* in 1999 with \$9.49 million dollars in sales.

3.2 Playstation 2:

This was SCE's second home platform, the PlayStation 2 (PS2) was released in Japan on March 4, 2000, and later in North America and Europe in October and November 2000, respectively. The PS2 is powered by a proprietary central processing unit, the Emotion Engine, and was the first video game console to have DVD playback functionality included out of the box. The PS2 stands as

the best-selling home video game console in history, with a total of 155 million consoles sold[5].

On regard to game sales (according to the parsed data), the PS2 made 1255.65 million dollars with 2161 released games. The PlayStation 2 has the most sold games in Sony's history. On this platform, the most relevant games are *Grand theft auto: San Andreas* (2004) with \$20.81 million dollars in sales, followed by *Grand Theft Auto: Vice City* (2002) with \$16.15 million dollars and *Gran Turismo 3: A-Spec* published in 2001 with sales for \$14.98 million dollars.

3.3 Playstation Portable(PSP):

The Sony PSP was the first handheld platform Sony announced in E3 on 2003 and unveiled in E3 again in the next year. It got released in Japan in 2004, US March 2005 and later in Europe in September 2005 along with Australia[5].

The PSP only sold \$294.3 million dollars (Compared to the Nintendo DS (\$807)) from 2005 to 2015. The most prominent game the PSP platform has is *Grand Theft Auto: Liberty City Stories* released in 2005 with a total sales of \$7.69 million dollars.

3.4 Playstation 3:

The PS3 was announced in 2006 and released in Japan the same year in November 11 followed by US in November 17 of the same year. The PS3 utilizes a unique processing architecture, the Cell microprocessor, a proprietary technology developed by Sony in conjunction with Toshiba and IBM. The graphics processing unit, the RSX "Reality Synthesizer", was co-developed by Nvidia and Sony[5]. Sales wise the PS3 holds the second best sales in Sony's platforms with total sales of \$939.43 million dollars. With titles released from 2006 to 2016 spread on 1331 unique games according to the data. Sony's PS3 most representative title is *Grand Theft Auto V* released in 2013 with \$21.04 million dollars in total sales followed by titles like *Call of Duty: Black Ops II* (2012) with \$13.79 Million

dollars in sales and *Call of Duty: Modern Warfare 3* (2011) with \$13.32 million dollars.

3.5 Playstation Vita:

The PS Vita is the successor of the PSP, It was released in Japan and other parts of Asia on December 17, 2011, and then in Europe, Australia and North America on February 22, 2012. Internally, the Vita features a 4-core ARM Cortex-A9 MPCore processor and a 4-core SGX543MP4+ graphics processing unit[5].

According to the data, is the worst performing platform money wise; it has sold \$54.12 million dollars and it has 432 games. The game that has sold the most is *Minecraft* with \$1.96 million dollars.

3.6 Playstation 4:

The PS4 was announced as the successor to the PS3 and was launched in North America on November 15, 2013, in Europe on November 29, 2013 and in Japan on February 23, 2014[5]. So far until December 2016 it has sold \$314.23 million dollars in games worldwide. According to the data, it spans 393 games and the most representative game is *Call of Duty: Black Ops 3* released in 2015 with \$14.63 million dollars in sales followed by *Grand Theft Auto V* in 2014 producing \$12.61 million dollars.

From all the data in the Sony's ecosystem we can say that the most representative game (sales-wise) is the *Grand Theft Auto* series. from the PS2 onwards. And *Gran Turismo* on the original PlayStation. You can see each Sony's platform with more detail using ARMeet and pointing the camera towards the image in Figure 3.1.

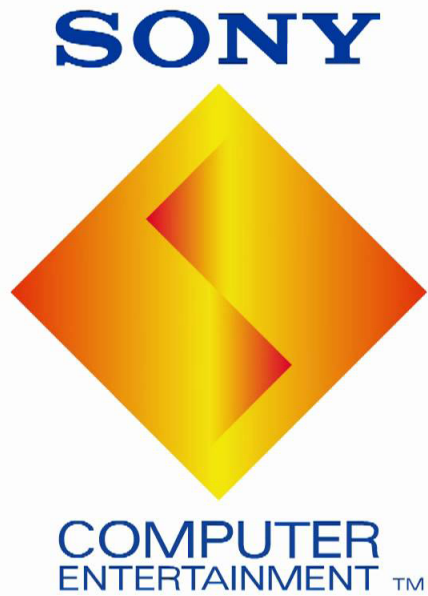


Figure 3.1: Representative picture of Sony, point ARMeet to this image to see the different sales on each platform.

4 Microsoft

The Xbox line belongs to Microsoft's gaming platforms. It represents a series of video game consoles developed by Microsoft, with three consoles released in the sixth, seventh, and eighth generations respectively. The brand also represents applications (games), streaming services, and an online service by the name of Xbox Live. The brand was first introduced on November 15, 2001 in the United States, with the launch of the original Xbox console[6].

4.1 Xbox:

The Xbox is a home video game console and the first installment in the Xbox series of consoles manufactured by Microsoft. It was released on November 15, 2001, in North America, followed by Australia, Europe and Japan in 2002. It was Microsoft's first platform into the gaming console market. The sixth-generation console competed with Sony's PlayStation 2 and the Nintendo GameCube. It was also the first console produced by an American company since the Atari Jaguar ceased production in 1996[6].

The Xbox platform is mostly represented by the *Halo* franchise in 2001 with *Halo: Combat Evolved* with sales of \$6.43 million dollars and with *Halo 2* in 2004 with \$8.49 million dollars.

The total sales for the Xbox platform where \$258.26 million dollars from 2001 to 2008 with 824 games released in total.

4.2 Xbox 360:

The Xbox 360 was released as the successor of the original Xbox in November 2005, competing with Sony's PlayStation 3 and Nintendo's Wii as part of the seventh generation of video game consoles[6].

Sales-wise, the Xbox 360 performed the best with sales of \$971.63 million dollars with 1262 registered games under this platform. The most iconic games for the

360 are *Kinect Adventures!* in 2010 with sales of \$21.81 million dollars, followed by *Grand Theft Auto V* (2013) with \$16.27 million dollars in sales and *Call of Duty: Modern Warfare 3* in 2011 with \$14.73 million dollars.

4.3 Xbox One:

The Xbox One was released on November 22, 2013 in North America, as the successor of the Xbox 360. The Xbox One competes with Sony's PlayStation 4 and Nintendo's Wii U as part of the eighth generation of video game consoles[6]. This platform is still early to judge with only 3 years in with sales. According to the dataset there have been sales of \$159.44 million dollars on 247 released games with the most representative title of *Call of Duty: Black Ops 3* released in 2015 with 7.39 million dollars.

In order to view with more detail Microsoft's sales please point *ARMeet* to Figure 4.1 and select a platform to view.



Figure 4.1: Representative picture of Microsoft, point ARMeet to this image to see the different sales on each platform.

5 SEGA

Originally short for *Service Games* and officially styled as SEGA, is a Japanese multinational video game developer and publisher headquartered in Tokyo, Japan, with multiple offices around the world. Sega developed and manufactured numerous home video game consoles from 1983 to 2001, but the financial losses incurred from its Dreamcast console caused the company to restructure in 2001[7].

5.1 Sega Genesis:

The Sega Genesis, known as the Mega Drive in most regions outside of North America, is a 16-bit home video game console which was developed and sold by Sega Enterprises, Ltd. The Genesis was Sega's third console and the successor to the Master System. Sega first released the console as the Mega Drive in Japan in 1988, followed by a North American debut under the Genesis moniker in 1989[8].

According to the data the Sega Genesis only released 29 games with sales for \$30.78 million dollars, its most representative game is *Sonic the Hedgehog 2* released in 1992 by SEGA itself with sales of \$6.03 million dollars.

5.2 Sega CD:

The Sega CD, released as the Mega-CD in most regions outside North America, is a CD-ROM accessory for the Sega Genesis video game console designed and produced by Sega as part of the fourth generation of video game consoles. The add-on was released on December 12, 1991 in Japan, October 15, 1992 in North America, and 1993 in Europe. The Sega CD lets the user play CD-based games and adds extra hardware functionality, such as a faster central processing unit and graphic enhancements[10]. With total sales of \$1.87 millions and 6 released games according to the dataset; is the 2nd lowest performing platform of SEGA. The most representative title for this platform is *Sonic CD* with \$1.5 million

dollars (more than half of the whole platform sales) released in 1993.

5.3 Sega Saturn:

The Sega Saturn is a 32-bit fifth-generation home video game console that was developed by Sega and released on November 22, 1994 in Japan, May 11, 1995 in North America, and July 8, 1995 in Europe as the successor to the successful Sega Genesis. The Saturn has a dual-CPU architecture and a total of eight processors. Its games are in CD-ROM format, and its game library contains several arcade ports as well as original titles[9].

This platform contains 173 registered games according to the data with total sales of \$33.59 million dollars; the most representative game is *Virtua Fighter 2* released in 1995 with \$1.93 million dollars in sales.

5.4 Sega Gamegear:

The Game Gear is an 8-bit handheld game console released by Sega on October 6, 1990 in Japan, 1991 in North America and Europe, and Australia in 1992. The Game Gear primarily competed with Nintendo's Game Boy, the Atari Lynx and NEC's TurboExpress. The handheld shares much of its hardware with the Master System and is able to play its own titles as well as those of the Master System, the latter being made possible by the use of an adapter. Containing a full-color backlit screen with a landscape format, Sega positioned the Game Gear as a technologically superior handheld to the Game Boy[11]. The only game available from the dataset is *Sonic The Hedgehog 2 (8-bit)* with sales only in Japan for \$0.04 million dollars.

5.5 Sega Dreamcast:

The Dreamcast is a home video game console released by Sega on November 27, 1998 in Japan, September 9, 1999 in North America, and October 14, 1999 in Europe. It was the first in the sixth generation of video game consoles, preceding Sony's PlayStation 2, Nintendo's GameCube and Microsoft's Xbox. The

Dreamcast was Sega's final home console, marking the end of the company's 18 years in the console market[12]. With global sales for \$15.97 million dollars and 52 registered games is the 3rd worst performing platform according to the dataset. Its most notorious game is *Sonic Adventure* released in 1998 with sales for \$2.42 million dollars.

To see with more detail SEGA's sales across the different platforms, point *ARMeet* to Figure ??



Figure 5.1: Representative picture of SEGA, point *ARMeet* to this image to see the different sales on each platform.

6 PC

The PC console is a special one as the dataset contains only labels for the PC platform but it doesn't specify the OS that was designed for.

PC Home computer games became popular following the video game crash of 1983 leading to the era of the "bedroom coder". In the 1990s, PC games lost mass-market traction to console games before enjoying a resurgence in the mid-2000s through digital distribution[13].

In general the PC "console" is the one that covers most of the years; from 1985 to 2016 according to the dataset. It's not fair to have a representative game across all these titles but it's worth mentioning that the *Sims 3* published by Electronic Arts in 2009 is the game that has the most sales with \$8.01 million dollars.

It is also important to note that the whole PC platform contains 974 registered games with 260.299 million dollars in sales. Curiously enough the PC platform doesn't have Japan sales like the other platforms. In order to see with more detail the PC platform, point *ARMeet* to Figure 6.1.



Figure 6.1: Representative picture of the PC console, point *ARMeet* to this image to see the different sales across the years.

7 Other consoles

This chapter talks about the less known / small consoles that either had a short lifespan or their sales were not significant enough to compete with the major video game consoles previously exposed. These consoles are drastically different and were produced in different years. The consoles:

7.1 Atari 2600:

The Atari 2600 (or Atari VCS before 1982) is a home video game console by Atari, Inc. Released on September 11, 1977, The console was originally sold as the Atari VCS, an abbreviation for Video Computer System. Following the release of the Atari 5200 in 1982, the VCS was renamed to the "Atari 2600", after the unit's Atari part number, CX2600. The 2600 was typically bundled with two joystick controllers, a conjoined pair of paddle controllers, and a game cartridge: initially *Combat*, and later *Pac-Man*[?]. The total games registered in the dataset for the Atari 2600 were 133 with total sales for this platform for \$97.08 million dollars with its most representative game being *Pac-Man* released in 1982 with sales for \$7.81 million dollars.

7.2 Wonder Swan:

The WonderSwan is a handheld game console released in Japan by Bandai. It was developed by Gunpei Yokoi's company Koto Laboratory and Bandai. Released in 1999, the WonderSwan Color and SwanCrystal were officially supported until being discontinued by Bandai in 2003. During its lifespan, no variation of the WonderSwan was released outside Japan. It was Powered by a 16-bit central processing unit, the WonderSwan took advantage of a low price point and long battery life in comparison to its competition, Nintendo's Game Boy Color and SNK's Neo Geo Pocket Color[15]. The dataset only contains 6 registered games for this platform with sales for \$1.42 million dollars; the most

representative game is *Final Fantasy* released in 2000 making half a million dollars.

7.3 Neo Geo:

the Neo Geo MVS and its home console counterpart, the Neo Geo AES. Both the arcade system and console were powerful for the time and the AES allows for perfect compatibility of games released for the MVS. However, the high price point for both the AES console and its games prevented it from directly competing with its contemporaries, the Sega Mega Drive (Genesis), Super NES (Super Famicom), and Turbo-Grafx 16[16].

Its most representative game was *Samurai Showdown II* released in 1994 and making \$250.000 usd. The NeoGeo only has 12 registered games in the dataset and according to it, it produced \$1.44 million dollars on its lifespan.

7.4 Turbo Grafx 16:

The TurboGrafx-16 Entertainment SuperSystem, known in Japan and France as the PC Engine, is a home video game console jointly developed by Hudson Soft and NEC Home Electronics, released in Japan on October 30, 1987, in the United States on August 29, 1989, and in France on November 22, 1989. It was the first console released in the 16-bit era, albeit still utilizing an 8-bit CPU. Originally intended to compete with the Nintendo Entertainment System (NES), it ended up competing with the Sega Genesis, and later on the Super Nintendo Entertainment System (SNES)[17].

The Turbo Grafx only has 2 games registered in the dataset with total sales of 160.000usd.

7.5 3DO Interactive Multiplayer:

The 3DO Interactive Multiplayer, often called simply the 3DO, is a home video game console platform developed by The 3DO Company. The 3DO was not a console manufactured by the company itself, but a series of specifications, that

could be licensed by third parties. Panasonic produced the first models in 1993, and further renditions of the hardware were released in 1994 by Sanyo and Gold-Star (now LG Corp).

Despite a highly promoted launch (including being named Time magazine's "1993 Product of the Year") and a host of cutting-edge technologies, the 3DO's high price and an oversaturated console market prevented the system from achieving success comparable to veteran competitors Sega and Nintendo. As a result, it was discontinued in late 1996, three years after its first release[18]. According to the dataset, the console only generated 100.000usd with 3 registered games.

7.6 NEC PC-FX:

The PC-FX is a 32-bit home video game console made by NEC Home Electronics. It was released in Japan on December 23, 1994, just weeks after Sony's PlayStation and a month after the Sega Saturn. It is the successor to the PC Engine, known as TurboGrafx-16 in North America. PC-FX was only released in Japan. The console is shaped just like a tower PC and was meant to be similarly upgradeable. However the PC-FX was using an outdated graphics chip that rendered the system underpowered in comparison to its competitors, which caused it to be a commercial failure[19]. The PCFX only has 1 registered game and according to the data it only sold 30.000usd.

To check with more detail the sales for these platforms just point *ARMeet* to Figure 7.1.



Figure 7.1: Representative picture of all the other platforms, point ARMeet to this image to see the different sales on each platform.

8 Conclusions

I have exposed 6 consoles with 31 platforms some of them are still present, some of them didnt even make it outside of their country. With the aid of the Augmented Reality application, the user would have hopefully understood better the data contained in the dataset.

No dataset is fully complete and unfortunately this dataset was not the exception; there are interesting visualizations that could have been implemented if the `Critic_score`, `Critic_count`, `User_score` and `User_count` fields where complete.

Performance is critical when developing mobile apps and one has to put more attention to detail when working with Augmented Reality in mobile devices as processing time not only has to be spent rendering images but also doing image processing to recognize image targets where the processed data is going to be anchored.

Comparisons are possible to be made just by dragging another image target to draw another UI to the right representing the console; unfortunately the comparisons that can be made are limited just to sales as the years of each platform differ vastly.

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