MobyGames: Quantify Me.

A brief quantitative analysis of the gaming era according to MobyGames.

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DISCLAIMER

For this small essay I have refrained to go into depth concerning epidemiological pitfalls that are clearly apparent in the data if one takes a closer look. It is not my purpose to present a sound scientific analysis of the real world. I am going to treat this data as is, pointing at possible trends in the gaming era. In the discussion I will go into some more qualitative remarks concerning the data.

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Abstract

Introduction. MobyGames (MG) is the self-acclaimed "most accurate" database on the internet that documents computer games released on all known platforms. There have been many gaming platforms throughout the past decades, since computer games started to surface in the late 70s. Given the notion that the number of games released for a platform equals its success, it is of some interest to examine the number of games released for each platform in time. Thus, if the number of games listed at MG is in some way representative of the actual games released in our world, we may take a look at history and shed some light on the dynamics of game platforms in time. Of particular note, it might be possible to determine the importance of each platform and gain an estimate of their success. **Methods.** MG publically lists all the games in their database, with game title, platform, publisher, and year of release as relevant variables. A selection was made of all platforms listed there and excluded specific platforms not relevant to the current analysis (i.e. platforms specifically only used in one or very few countries). The following variables were obtained for each game listed there: platform, year of release (according to MG), publisher. The data were fed to SPSS 20.0 for further statistical analysis. Descriptive statistics were used to present the data. Duplicate game titles were identified by exact comparison of titles listed at MG. Unique game titles were ranked to the entered year of release. The data was gathered from MG between December 11th and December 13th 2012. **Results.** A total of 59936 game entries were found in the public MG database for 48 platforms selected for the time period of 1977 through 2012. Two peaks in yearly releases could be identified in 1990 and 2008. Out of the 59936 entries, the number of duplicate game titles was observed to be 33248 (55.47). The large majority of unique game titles at MG is associated with only 1 platform (20700 unique game titles, 62.26%), the list topped by Nintendo DS (63.4%), Atari 2600 (62.4%), Windows (60.6%), Nintendo DSi (59%) and GameBoy Advance (57.1%). The top 5 impact companies are Microsoft, Sony, Nintendo, Apple and Commodore. Though the number of games released for a Microsoft OS is dominating, the number of games released for the Commodore platforms (2nd most number of games for many years) has only recently been surpassed by Nintendo. **Discussion.** By far the most games have been released for Windows and DOS, and the market is still dominated by games running on a Microsoft OS. In the 1980s, 11 different companies were on the market of which Commodore was the most popular platform. Later decades showed the continued emergence of Nintendo, Apple and Microsoft OS, with Sony joining in 1994. To date those four companies define the market. The dynamics of games released for their platforms suggests different marketing strategies. The 1980s were dominated by games released for a multitude of platforms, while in the 1990s and early 2000s games were more unique to a platform. The last decade this has turned around back to a situation similar to the 1980s, most games released on multiple platforms. A dramatic decrease in the number of games released per year since 2009 indicates a possible issue at MG.

1. Introduction

MobyGames (MG, www.mobygames.com/) is the self-acclaimed "most accurate" database on the internet that documents computer games released on all known platforms. When the website started, anyone could simply contribute, but it evolved into a peer reviewed process where contributors can submit new information on games, that is then checked by a reviewer. Though this process has been criticized by some contributors, claiming reviewers do not know enough about the matter; it is still worthwhile taking the data as is for further analyses.

There have been many gaming platforms throughout the past decades, since computer games started to surface in the late 70s. Given the notion that the number of games released for a platform equals its success, it is of some interest to examine the number of games released for each platform in time. Thus, if the number of games listed at MG is in some way representative of the actual games released in our world, we may take a look at history and shed some light on the dynamics of game platforms in time. Of particular note, it might be possible to determine the importance of each platform and gain an estimate of their success.

2. Methods

MG publically lists all the games in their database, with game title, platform, publisher, and year of release as relevant variables. A selection was made of all platforms listed there and specific platforms not relevant to the current analysis (i.e. platforms specifically only used in one or very few countries) were excluded. The relevant information was then taken from the website via a custom programmed automated process. The following variables were obtained for each game listed there: platform, year of release (according to MG), publisher. The data were fed to SPSS 20.0 for further statistical analysis. Descriptive statistics were used to present the data. Duplicate game titles were identified by exact comparison of titles listed at MG. No quality driven analysis was done to further identify duplicates based on slight differences between game titles. Unique game titles were ranked to the entered year of release. In effect, the database entries were sorted to unique game titles by first year of appearance of that game title for sub analyses. The data was gathered from MG between December 11th and December 13th 2012. Prime time periods of platforms were defined by visual assessment of curves depicting the number of games released in time.

3. Results

3.1 Basic data

A total of 59936 game entries were found in the public MG database for the platforms listed in *Table 1*, as 48 platforms were chosen for the current analysis. The platform names are taken from the MG database as is. Out of the 59936 entries, the number of duplicate game titles was observed to be 33248 (55.47%). This suggests that around half of the entries at MG may be about the same game, released on different platforms. Indeed, the number of different platforms for each game title ranged between 1 and 22. For example, the game title "Monopoly" was the sole

game title found for 22 different platforms. See *Table 2* for an overview of the distribution of the game titles versus the number of platforms attributed to that game title. The large majority of unique game titles at MG is associated with only 1 platform (20700 unique game titles, 62.26%). Of the 59936 entries, 59912 (99.96%) had a Year of Release.

Table 1. The number of games listed at MG by platform.

Mobygames platform	Number of games	Percentage
Acorn 32-bit	93	0.20%
Amiga	2798	4.70%
Amiga CD32	164	0.30%
Amstrad CPC	1603	2.70%
Apple II	884	1.50%
Apple IIgs	128	0.20%
Atari 2600	556	0.90%
Atari 5200	82	0.10%
Atari 7800	65	0.10%
Atari 8-bit	796	1.30%
Atari ST	1995	3.30%
BBC Micro	237	0.40%
Commodore 16, Plus/4	132	0.20%
Commodore 64	3188	5.30%
Commodore PET/CBM	308	0.50%
DOS	5581	9.30%
Dragon 32/64	129	0.20%
Dreamcast	379	0.60%
Electron	154	0.30%
Game Boy	594	1.00%
Game Boy Advance	821	1.40%
Game Boy Color	439	0.70%
Game Gear	289	0.50%
GameCube	558	0.90%
Genesis	950	1.60%
Macintosh	3412	5.70%
MSX	982	1.60%
NES	1135	1.90%
Nintendo 3DS	119	0.20%
Nintendo 64	324	0.50%
Nintendo DS	852	1.40%
Nintendo DSi	83	0.10%
PlayStation	1956	3.30%
PlayStation 2	2255	3.80%
PlayStation 3	1555	2.60%
PS Vita	147	0.20%
PSP	871	1.50%
SEGA CD	190	0.30%
SEGA Master System	341	0.60%
SEGA Saturn	531	0.90%
SNES	1046	1.70%
VIC-20	194	0.30%
Wii	1242	2.10%
Windows	13894	23.20%
Windows 3.x	967	1.60%
Xbox	947	1.60%
Xbox 360	1852	3.10%
ZX Spectrum	2118	3.50%

Table 2. The number of platforms associated with unique game titles at MG.

Platforms (n)	Game titles (n)	Percentage
1	20700	62.26%
2	6263	18.84%
3	3104	9.34%
4	1362	4.10%
5	711	2.14%
6	472	1.42%
7	251	0.75%
8	143	0.43%
9	83	0.25%
10	57	0.17%
11	38	0.11%
12	18	0.05%
13	9	0.03%
14	12	0.04%
15	9	0.03%
16	3	0.01%
17	4	0.01%
18	3	0.01%
19	2	0.01%
20	2	0.01%
21	1	0.00%
22	1	0.00%

3.2 Platform dedicated titles

As stated, 20700 game titles listed at MG are associated with a single platform (Table 2). It is then possible to calculate which game titles are dedicated to which platform and compare that with the total number of game titles for those platforms. The result of that is shown in Table 3. The software for the Nintendo DS is dedicated to that platform for 63.4% of games listed. Conversely, no games released for the Commodore 16/Plus 4 or Acorn Electron were created solely for those platforms. For some titles, the same platform was listed more than once, possibly indicating that different games with the same title were released for that platform, during different years. Some sampling did confirm this. For example, for the MSX platform 6 games are listed with the same name but classified twice as separate entries in MG (2 times a game with the same name is attributed to the MSX platform). The games in question are Genghis Khan, Humphrey, Konami's Tennis, Picture Puzzle, Tetris and Turmoil. Of these, some are two different games with the same title, but others (e.g. Konami's Tennis) are double entries in MG.

Table 3. Distribution of unique game titles listed at MG by platform

Platform	Unique titles	Total titles	Percentage unique
Nintendo DS	540	852	63.4%
Atari 2600	347	556	62.4%

|			
Windows	8423	13894	60.6%
Nintendo DSi	49	83	59.0%
Game Boy Advance	469	821	57.1%
Commodore PET/CBM	152	308	49.4%
Dragon 32/64	63	129	48.8%
NES	542	1135	47.8%
Game Boy Color	203	439	46.2%
SNES	471	1046	45.0%
DOS	2441	5581	43.7%
Nintendo 64	138	324	42.6%
PlayStation	827	1956	42.3%
Dreamcast	150	379	39.6%
SEGA CD	74	190	38.9%
Game Boy	229	594	38.6%
Genesis	350	950	36.8%
PlayStation 2	821	2255	36.4%
MSX	335	982	34.1%
SEGA Saturn	173	531	32.6%
Nintendo 3DS	38	119	31.9%
SEGA Master System	103	341	30.2%
Xbox 360	535	1852	28.9%
PSP	247	871	28.4%
Wii	321	1242	25.8%
Atari 7800	16	65	24.6%
Windows 3.x	215	967	22.2%
Game Gear	59	289	20.4%
VIC-20	39	194	20.1%
GameCube	108	558	19.4%
Commodore 64	495	3188	15.5%
Apple II	134	884	15.2%
Xbox	142	947	15.0%
ZX Spectrum	304	2118	14.4%
Amiga	389	2798	13.9%
Atari 8-bit	109	796	13.7%
Atari 5200	9	82	11.0%
Atari ST	218	1995	10.9%
PlayStation 3	169	1555	10.9%
Amiga CD32	14	164	8.5%
Acorn 32-bit	6	93	6.5%
PS Vita	9	147	6.1%
BBC Micro	12	237	5.1%
Macintosh	164	3412	4.8%
Apple IIgs	4	128	3.1%
Amstrad CPC	44	1603	2.7%
Commodore 16, Plus/4	0	132	0.0%
Electron	0	154	0.0%

Of the first five platforms in *Table 3* more than 50% of the game titles are attributed to one platform only. Game names were unique for 63.4% of Nintendo DS, 62.4% for Atari 2600, 60.6% for Windows, 59% for Nintendo DSi and 57.1% for GameBoy Advance titles. The data suggests that the majority of the games released for these platforms were in fact specifically designed for these platforms. With three out of 5 in the top 5, Nintendo's strategy seems clear for the handhelds, perhaps using features of their hardware not found in other devices, as well as specific game franchises

(e.g. Mario, Donkey Kong and others). The Windows platform is also one with a strong dedicated game title base, again suggesting that specific PC features make it not feasible to release those games on other platforms that lack those.

3.3 Games by year

The results of paragraph 3.2 are further presented in the current paragraph. The number of games released on all platforms by each year is depicted in *Figure 1*. This includes duplicate titles on a multitude of different platforms. The highest peaks in the number of game releases were observed for the years 1990 (n=2580) and 2008 (n=2624). Visually, additional peaks can be identified for the following years: 1984 (n=1288), 1996 (n=2030), 2000 (n=1820) and 2002 (n=2039). Of note, from 2009 onwards, the number of games listed per release year shows a sharp decrease, to 1141 at database lock in December 2012. Relating to the value of 2624 game listings attributed to 2008 in the MG database, this represents a decrease of 56% in terms of yearly releases. The mean number of games per year was 1664, and a median of 1846.

Games per release year listed at MG
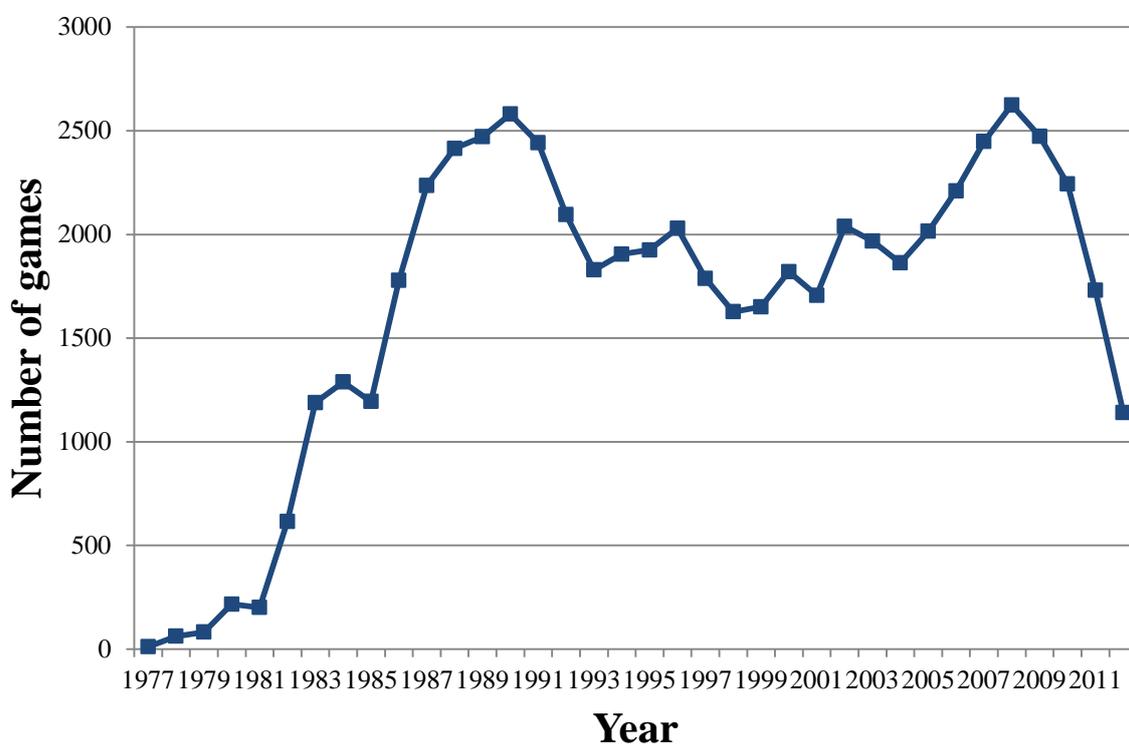
Figure 1. Number of games listed by release year at MG. Two high peaks are visible, in 1990, and in 2008.

3.3.1 Games by unique titles and year

When further ranking of entries at MG was done by selecting only unique game titles for the first year of appearance of this title, the total number of games released by

year is depicted in *Figure 2*. The figure suggests an increase in the number of unique games per year up to 2008, with a first, sharp increase in 1982 and 1983. In 1990, for the first time the number of games is higher than 1000. In this period, from 1990 through 1999 there is a 10 year plateau in the number of games released according to MG. More specifically, the number of releases remains between lowest number of 1027 (in 1990) and highest number of 1171 (in 1994) for a full decade. Growth continues only from 2000 onwards through 2008. From that period on there is a sharp decrease in games listed as released from those years at MG. From 2008 to 2012 a 73% decrease in yearly games released.

Yearly releases of unique game titles listed at MG by first year of appearance
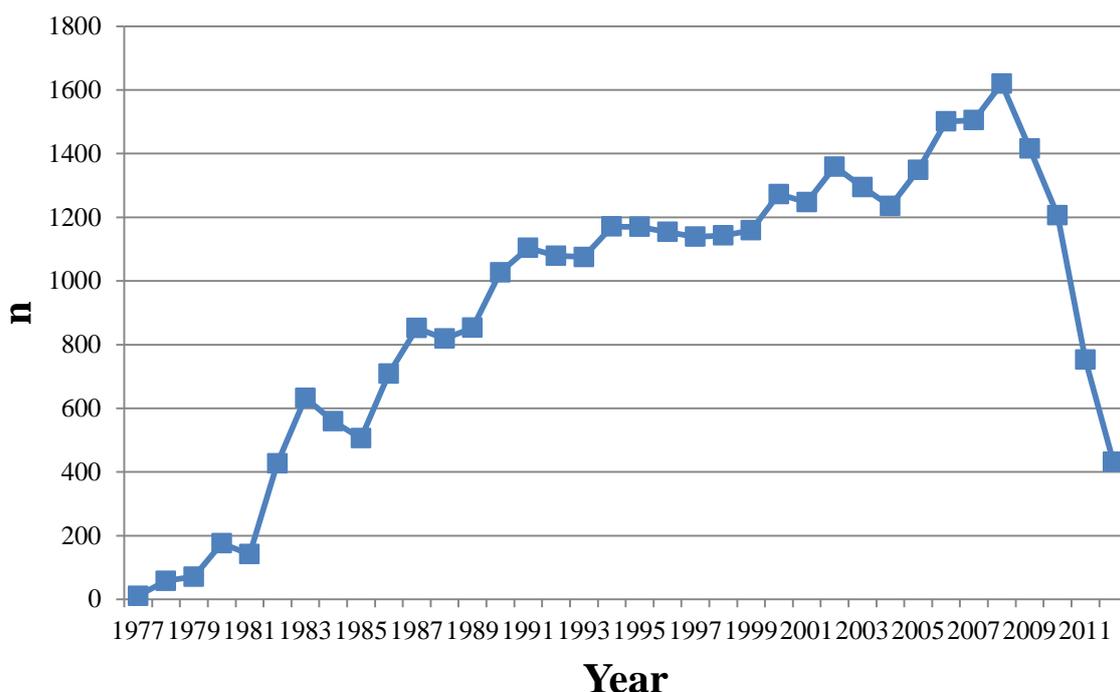
Figure 2. The number of games released by year with unique titles as listed at MG. The data from the figure suggests a continued increase in the number of games released by year through 2008. From then on, MG lists less each year, going from 1620 in 2008 to 432 (-73%) in December 2012.

3.3.2 Games by unique titles for single and multiple platforms

The 33248 unique game titles at MG can be further separated by platform, of particular interest the number of games with unique titles released on a single platform. When the distribution of these "platform specific unique titles" by year is plotted, the result is *Figure 3*. In the first age of home computers, there is a sharp drop in platform-dedicated titles reaching a peak low of 12.2% in 1988. In effect, according to MG, in that year 87.8% of games released were released on multiple computer platforms. In contrast, in 2001 55.7% of game titles were attributed to a single platform only. Indeed, from 1990 onwards the trend was reversed, peaking at

1994 (40%), 2001 and 2006 (51.9%). However, from 2007 onwards, there is another sharp decrease in game titles unique and specific for a single platform, hitting a low 20% in 2012. Remember that the number of unique game titles (regardless of number of platforms attributed to them) also declined as was shown in *Figure 2*. So, when comparing the percentage of unique game titles by year at MG, with the percentage of platform specific unique titles, it is evident that both follow the same trend closely (*Figure 4*).

Distribution of unique-per-platform game title at MG by year
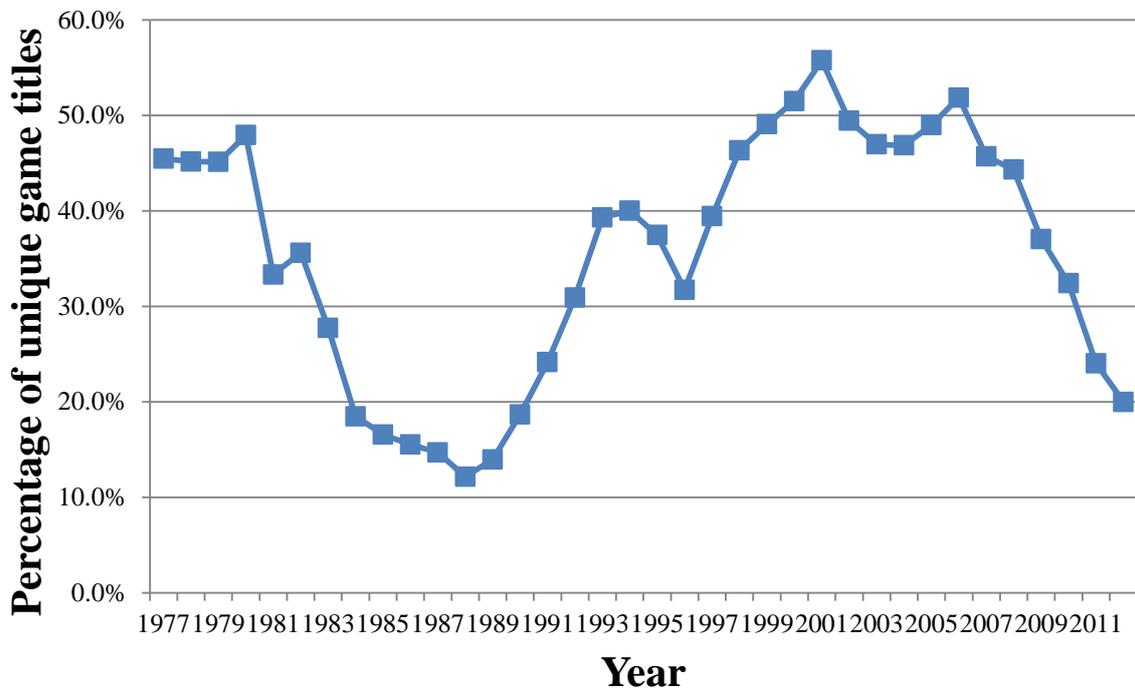
Figure 3. Percentage of unique game titles with only one platform at MG by year.

Distribution of unique game titles vs unique game titles on single platform
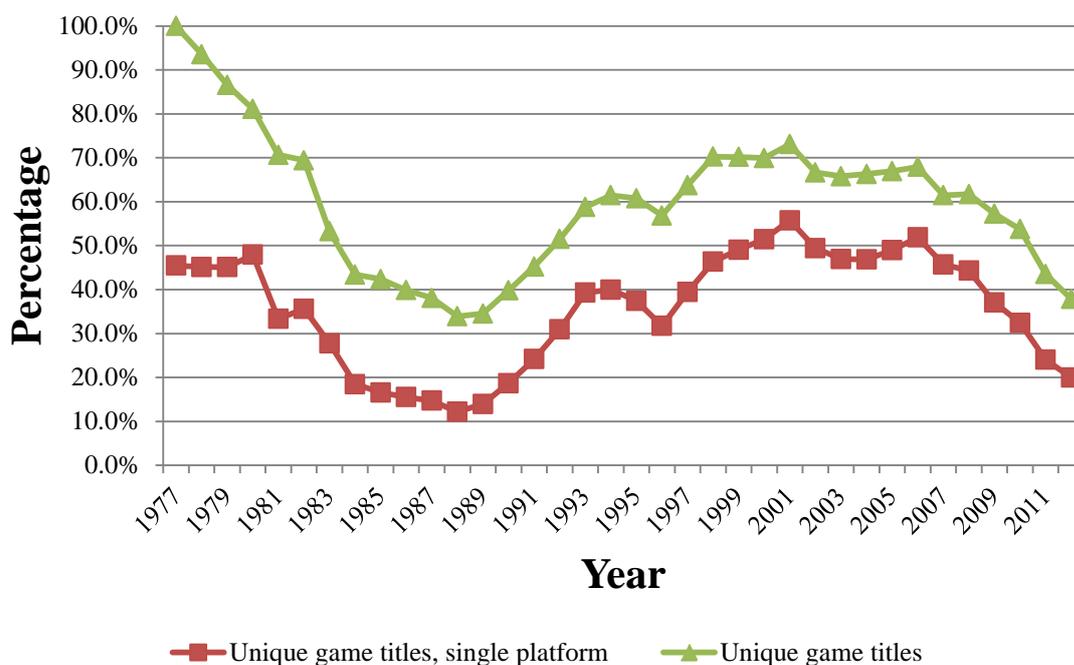
Figure 4. Percentage of unique game titles with only one platform versus unique game titles overall at MG by year.

Even though percentages are informative, the difference in number of unique game titles on a single platform versus unique game titles on multiple platforms is best shown as is. This is depicted in *Figure 5*. For each of the 33228 (20 listed titles had missing years of release) unique game titles for either a single platform, or for multiple platforms, the data are plotted. Note that those game titles found on multiple platforms may be released years apart from first appearance of the title. So, if a game called "Monopoly" was released in 1984 for the first time, and it lasted until 2000 for a second game to appear with the same name, the game title is still marked as "unique, multiple platforms" for 1984. The first period both categories seem to be distributed equally, but from 1984 onwards to 1991 more identical game titles are released on multiple platforms. However, from 1991 on, the yearly release of unique game titles for a single platform is higher than those released for multiple platforms. Indeed, the number of unique game titles for single platforms shows a steady increase through 2008, after which a sharp decline is apparent. In contrast, from 1992 onwards through 2007, the number of unique games released for multiple platforms seems to hold steady at around 400 per year. In addition, a slight peak to 500 in 2009 is clear, as well as a sharp decline from 2011 on.

Unique game titles for single and multiple platforms by year
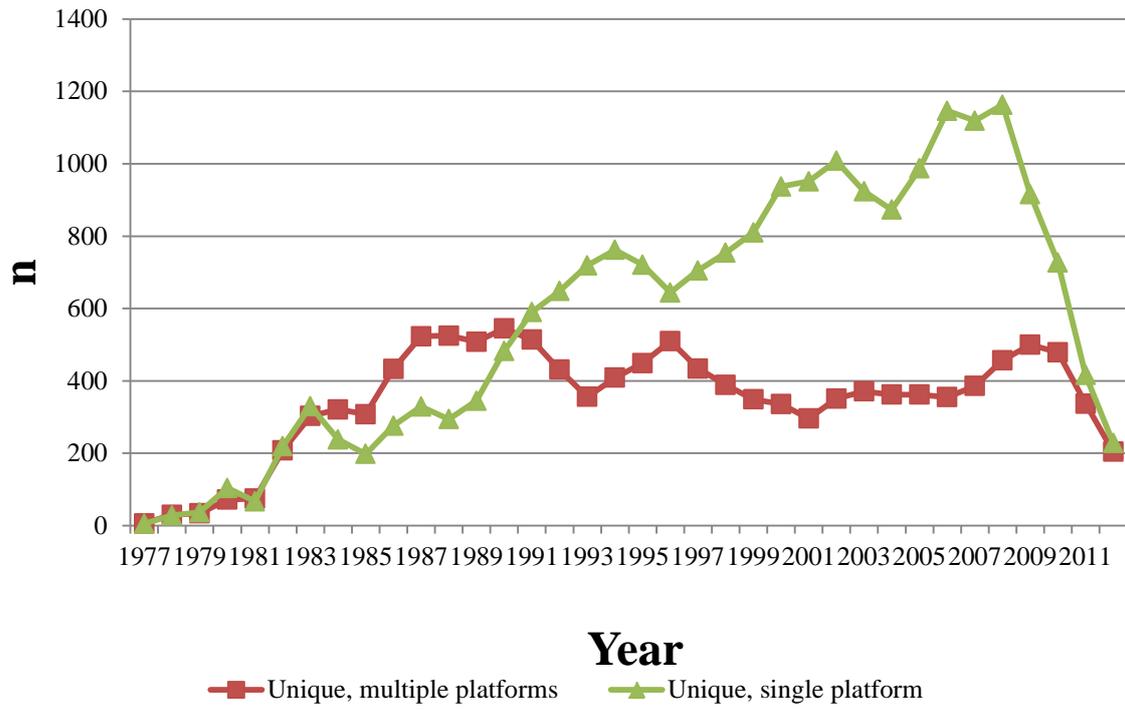
Figure 5. Number of unique game titles for single platform, versus multiple platforms, by first year of appearance of the game title.

3.4 Game titles for all platforms by year

The games listed at MG can be separated by the 48 platforms and year, and the result plotted in a single chart. This is done for *Figure 7A* (all games) and *7B* (single platform games). The data in the figures can be viewed to represent the rise and fall of the platforms shown. They are rather large charts with 48 differently colored lines for each platform. Looking at the average number of games listed per platform at MG (using each year that has at least 1 release) it is evident that some platforms are "bigger" than others in terms of games released for them. When plotting the average yearly releases, we get *Figure 6*.
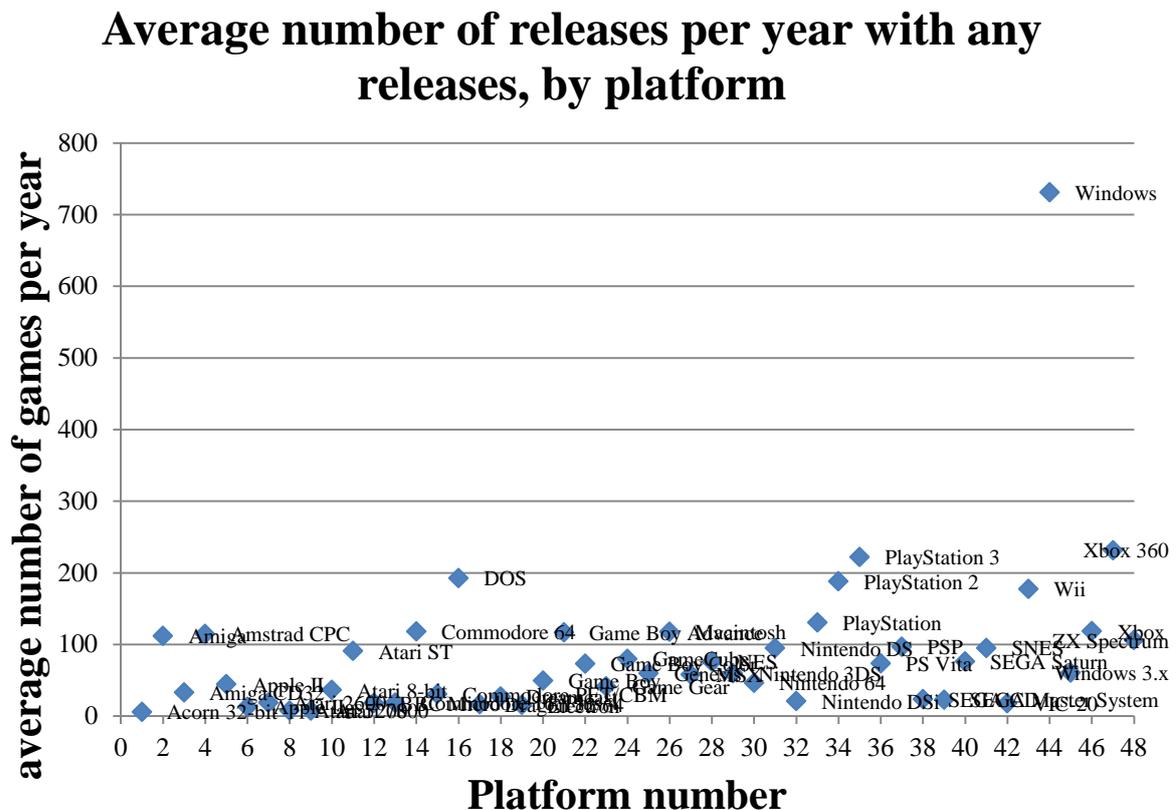
Figure 6. Average number of games per year by platform.

3.5 Game titles for impact platforms by year

The average number of releases per year for all platforms is 87.1 games. The impact platforms were then selected on the basis of their points ranking (from 48 points to 1 point) for both highest yearly releases as well as total number of games ever released. So the max number of points for any platform is 96 (48 for yearly releases + 48 for total number of games ever). In *Table 4* the thus gotten points are presented for each platform. Those platforms scoring at least 49 points (impact platforms) can then be further separated from the rest for clarity. *Figure 8* represents the yearly releases for impact platforms by year. 24 platforms were identified as impact platforms, as shown in the chart, and also presented in *Table 4*.
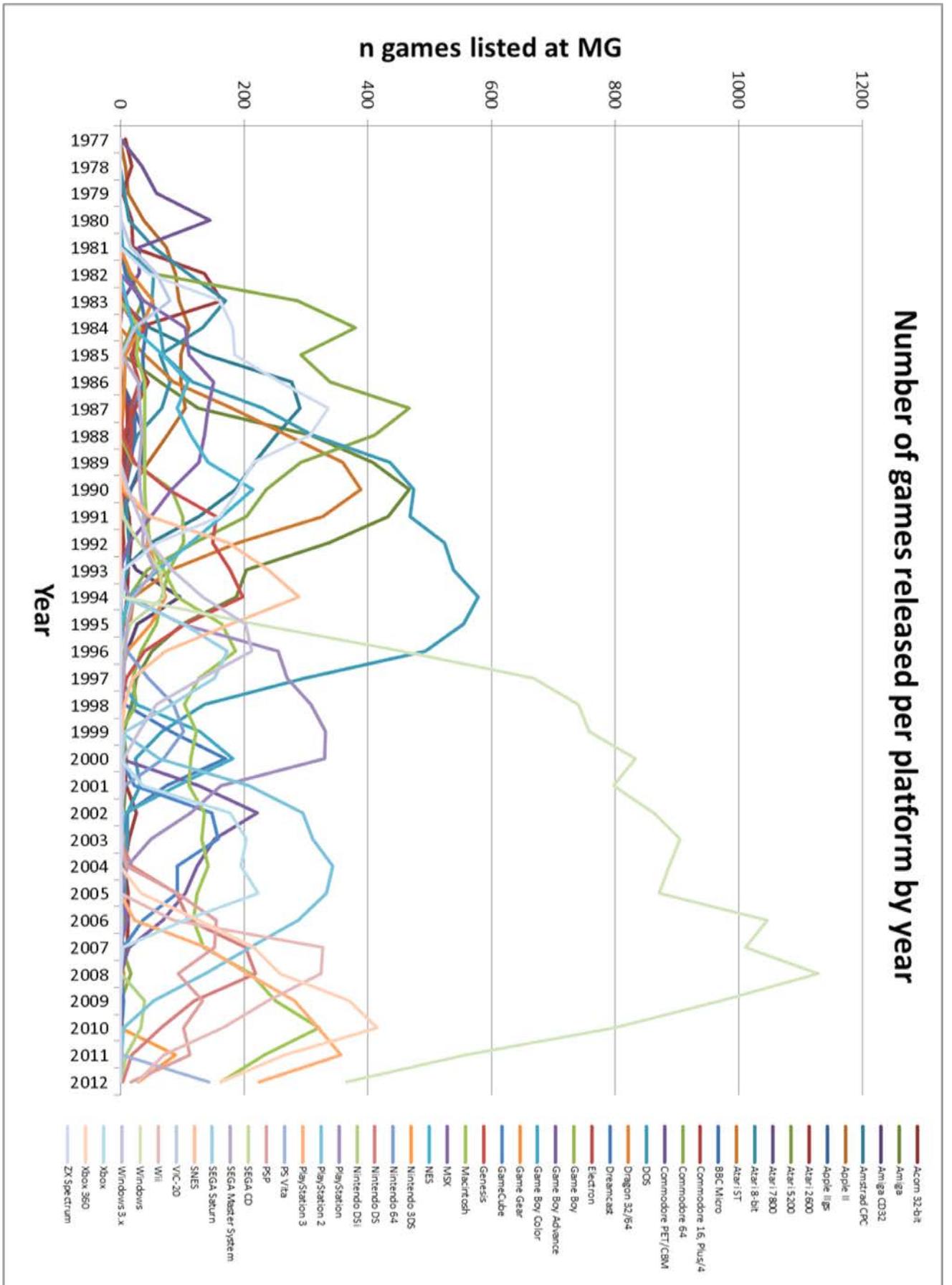
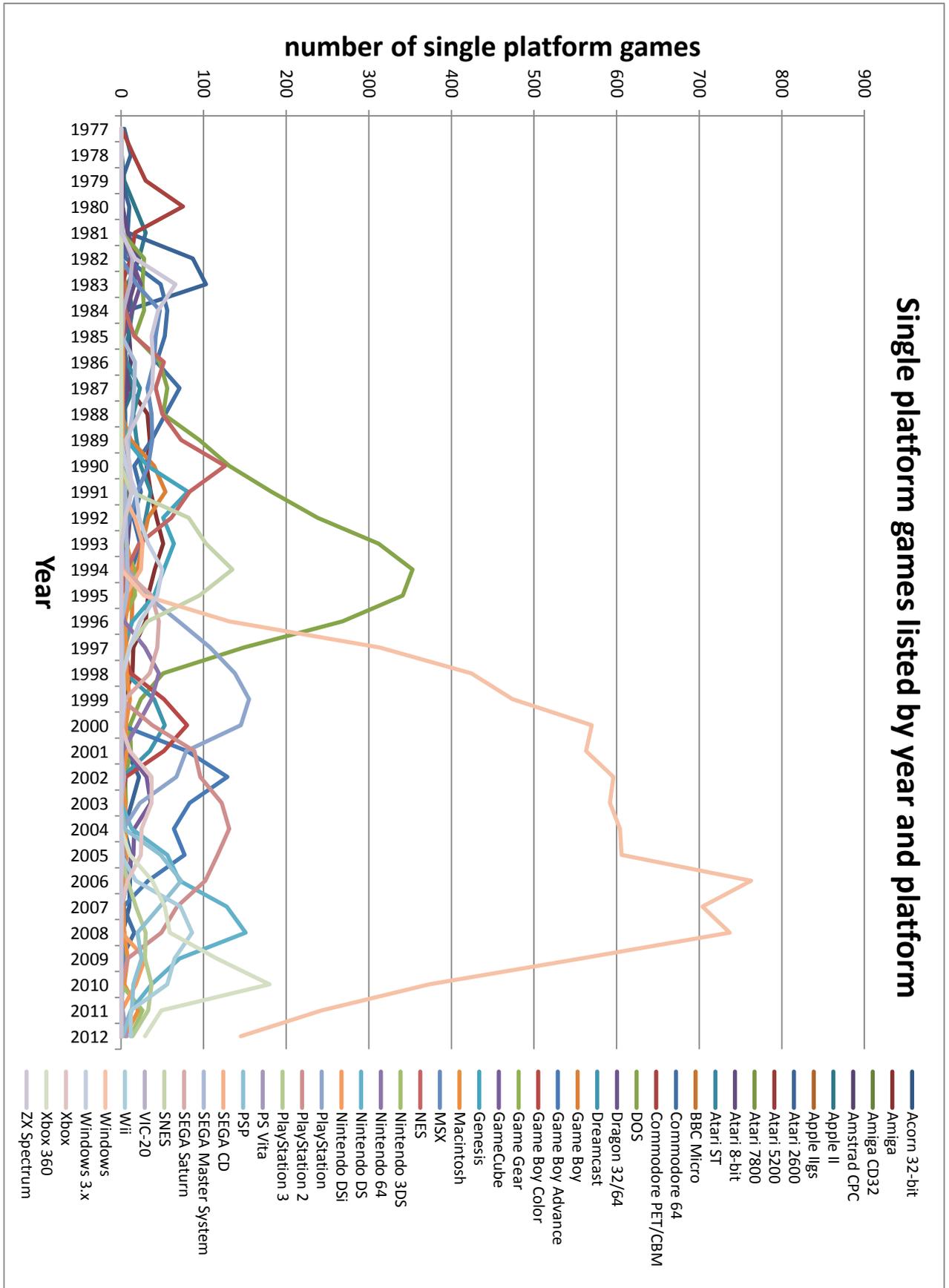*Figure 7A. Number of games listed at MG by platform and year.*

Figure 7B. Number of unique games listed for a single platform by year and platform.

Table 4. Impact Points-ranking of platforms listed at MG

| Platform	Total points
Windows	96
DOS	92
PlayStation 2	87
Xbox 360	86
Commodore 64	85
Macintosh	85
PlayStation 3	83
PlayStation	82
Amiga	80
Wii	79
ZX Spectrum	77
Amstrad CPC	75
Atari ST	72
Xbox	71
SNES	67
Game Boy Advance	65
NES	63
PSP	62
Nintendo DS	58
Windows 3.x	56
Genesis	56
MSX	54
GameCube	52
SEGA Saturn	50
Apple II	48
Game Boy Color	46
Game Boy	45
Atari 8-bit	42
Nintendo 64	35
Game Gear	34
Dreamcast	33
Commodore PET/CBM	32
Atari 2600	32
PS Vita	31
SEGA Master System	30
Nintendo 3DS	29
Amiga CD32	29
SEGA CD	24
BBC Micro	22
Commodore 16, Plus/4	17
VIC-20	17
Electron	17
Nintendo DSi	12
Dragon 32/64	12
Apple IIgs	12
Acorn 32-bit	10
Atari 5200	6
Atari 7800	4

Number of games per year by impact platform
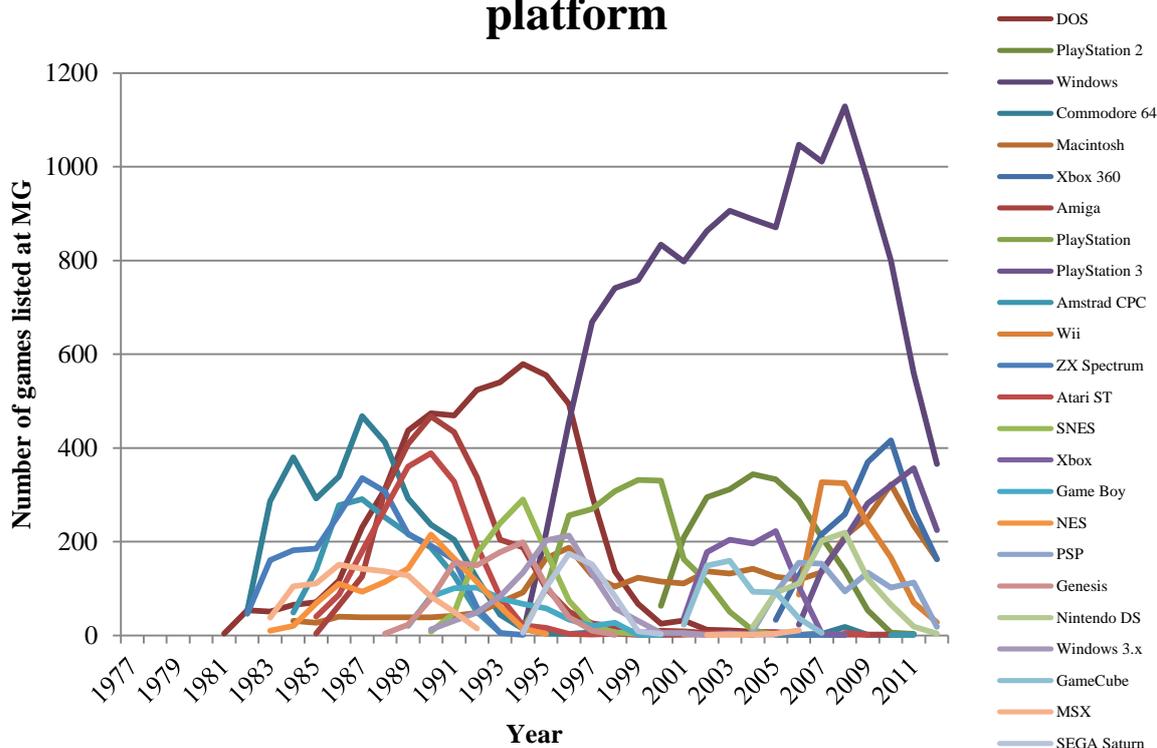
Figure 8. Number of games at MG attributed to impact platforms per year.

The impact of a platform producing company can also be assessed. In the case of Nintendo, they have released the Wii, SNES, Game Boy Advance, NES, Nintendo DS, GameCube, Game Boy Color, Game Boy, Nintendo 64, Nintendo 3DS and Nintendo DSi, 11 platforms overall. It is therefore of interest to examine the overall "games market share" of each company that is behind the different gaming platforms. Nintendo has the above mentioned 11 platforms. Then the following companies can be further defined: Microsoft (DOS, Windows, Windows 3.1x, Xbox and Xbox360), Commodore (PET/CBM, VIC-20, 64, 16, Amiga and Amiga CD32), Sony (PlayStation 1-3, PSP and PS Vita), Sega (Dreamcast, Game Gear, Genesis, SEGA CD, SEGA Master System and SEGA Saturn), Apple (Apple II, Apple IIgs and Macintosh), Atari (Atari 2600, Atari 5200, Atari 7800, Atari 8-bit and Atari ST), Acorn (Electron, BBC Micro and Acorn 32) and the others are Sinclair, Amstrad, Dragon and MSX (though that is not a company, but a platform). As can be seen from the pie chart of *Figure 9*, there are 4 companies that each have more than 10% of the total number of games listed at MG: Microsoft (39%), Nintendo (12%), Commodore (11%) and Sony (11%). Together they represent about three quarters of the total number of games. The top 5 is completed by Apple with 7%.

Distribution of total games listed for each platform building company
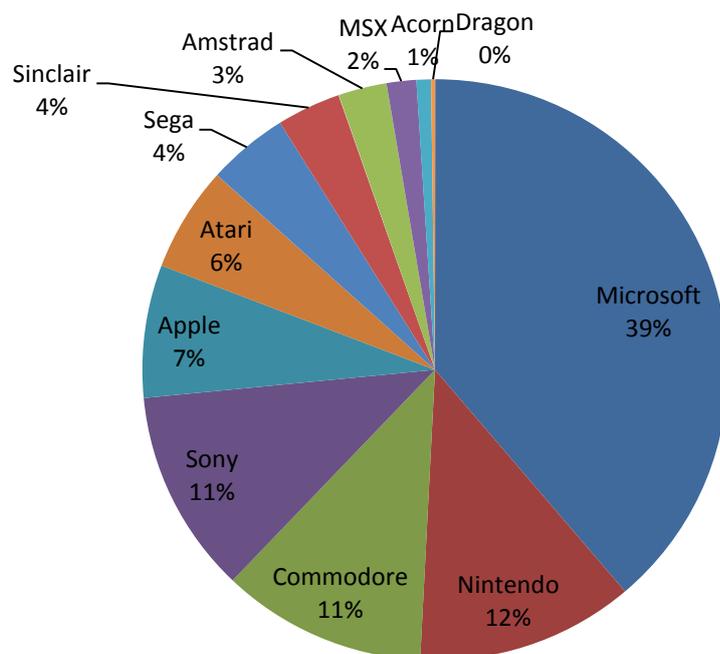
Figure 9. Distribution of total games listed for each platform building company

The dynamics of games released for platforms created by these companies can be expressed as seen in *Figure 10*. Commodore was the biggest player in the first decade of home computers, while the second and third decade are dominated by Microsoft (by far), Nintendo and Sony. Apple's Mac seems to rise as a gaming platform from 2008 on, but has otherwise been holding steady at around 126. One can also take a look at the accumulation rate of games by year for the companies (*Figure 11*). Clearly, Microsoft OS based platforms dominate with the steepest and highest accumulation of games, while Commodore has been first until 1997, and from then on second for decades. Commodore was only recently surpassed by Nintendo (2010), while Sony managed to match it this year (2012). When defining the major time periods where games were released for these platforms, only 4 companies are left in 2012 (*Figure 12*), Microsoft, Apple, Nintendo and Sony.

3.6 The big 5 in time

Finally, the dynamics of games released (as listed at MG) for platforms attributable to each of the top 5 aforementioned companies are presented in *Figure 13*. Different dynamics per group of platforms is clear from the figure.

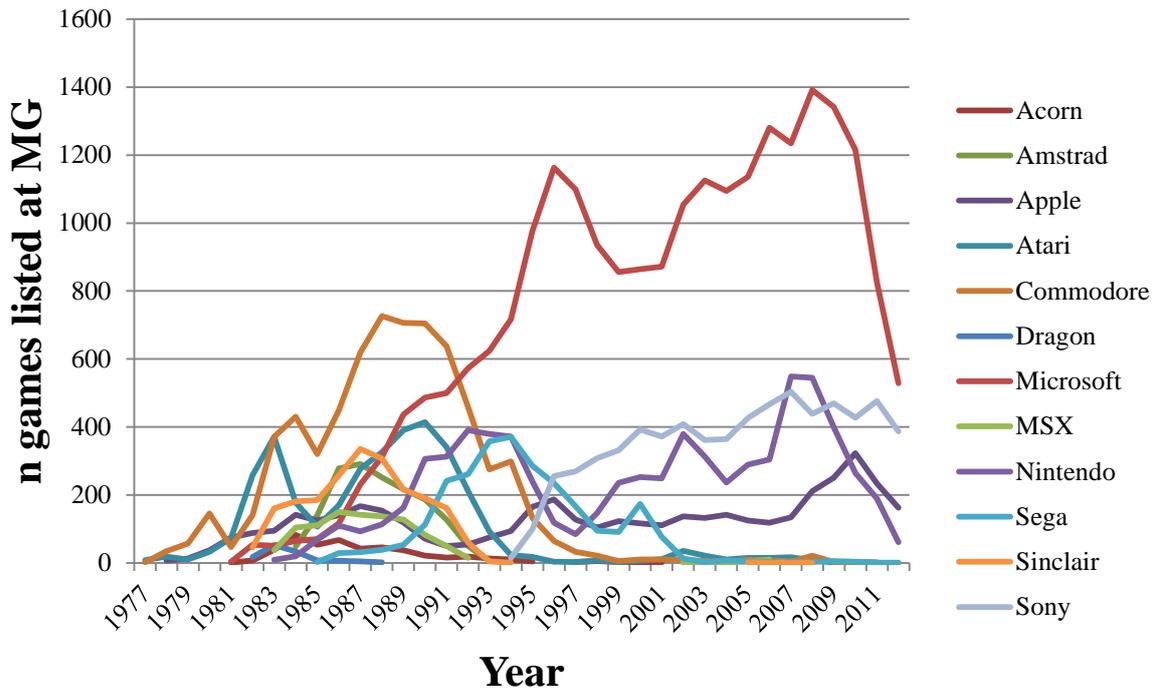## Total number of games listed per platform-company by year

Figure 10. Total number of games released yearly on platforms created by 12 companies.

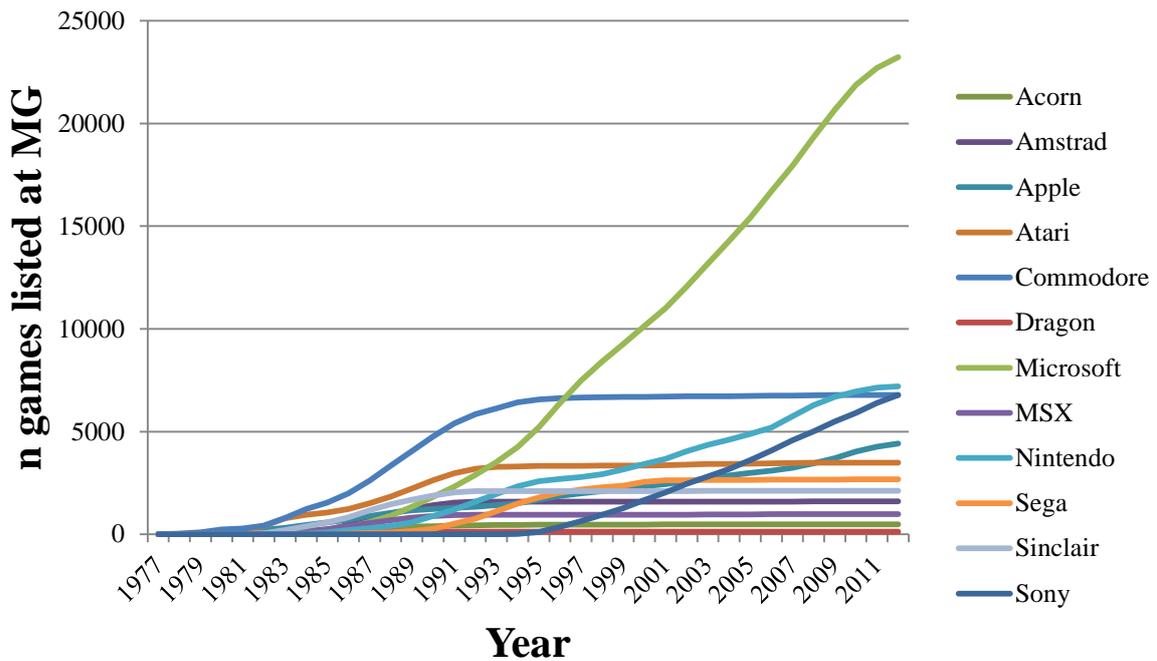## Cumulative number of games by year

Figure 11. Cumulative number of games released by year created for platforms from 12 companies.
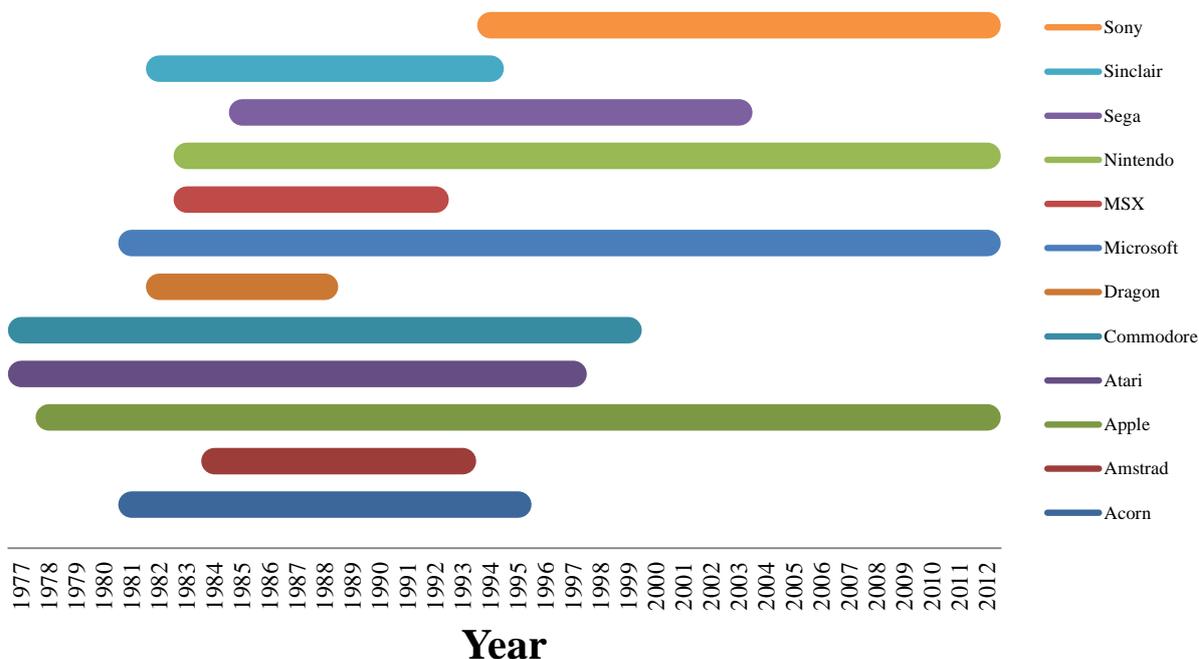
Defined time periods of platform-company

Figure 12. The time periods where the bulk of games were released by platform-company.

4. Discussion

This is the first descriptive analysis of the data presented by MobyGames to date. According to the information listed there, there are two big peaks in number of games per year, one in 1990, and the other in 2008. The data further indicate that 5 companies had the biggest impact on the gaming industry by creating platforms for the development of games: Commodore, Apple, Microsoft, Nintendo and Sony. While the Commodore 64 is the most successful 8-bit gaming platform, Windows-based computers have totally dominated the games market for 15 years, with more games per year than the three other players (Apple, Sony and Nintendo) together. However, in 2011, for the first time, there were more games released on the Mac, Sony platforms and Nintendo platforms together, versus Windows.

Unique game titles. In terms of unique game titles listed, the 1980s and the early 1990s seems to be a period where it was popular to release the same game on a multitude of platforms, or at least use the same name for a game on multiple platforms. As low as 12.2% unique game titles in 1988. All games were released on practically all platforms in those days the data suggests. The top 5 of platforms where the most unique game titles were found are: Nintendo DS (63.4%), Atari 2600 (62.4%), Windows (60.6%), Nintendo DSi (59.0%) and Game Boy Advance (57.1%).
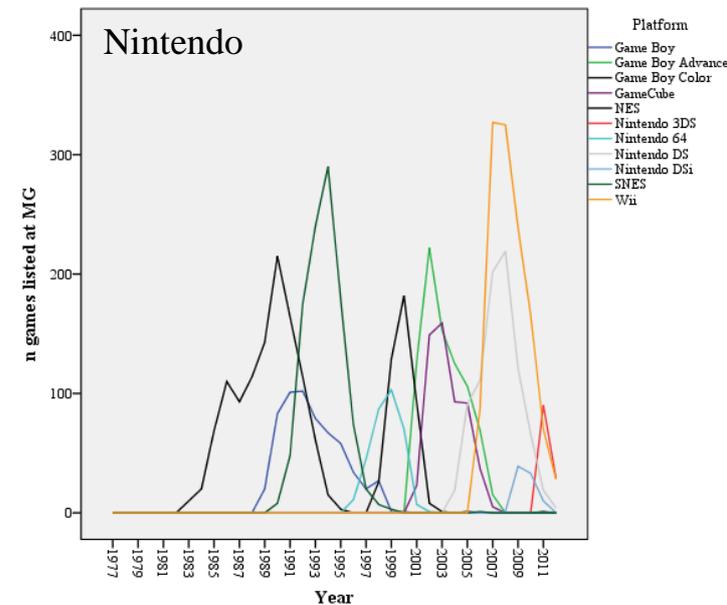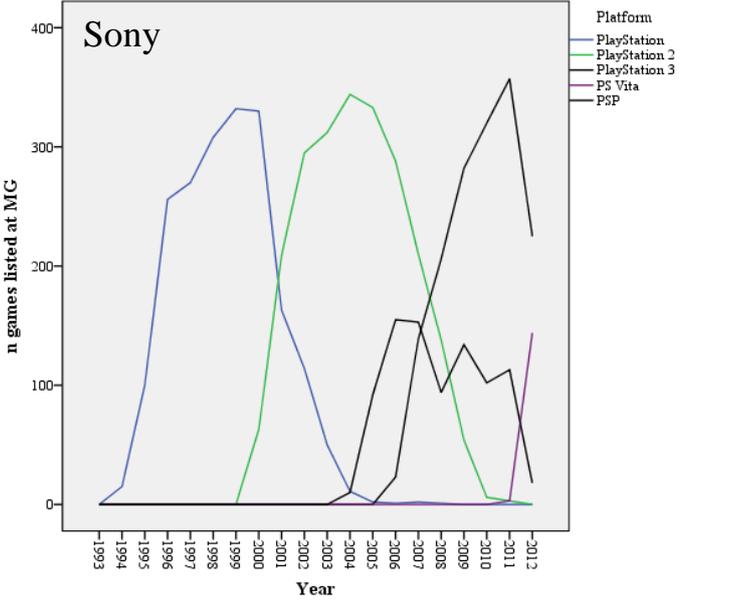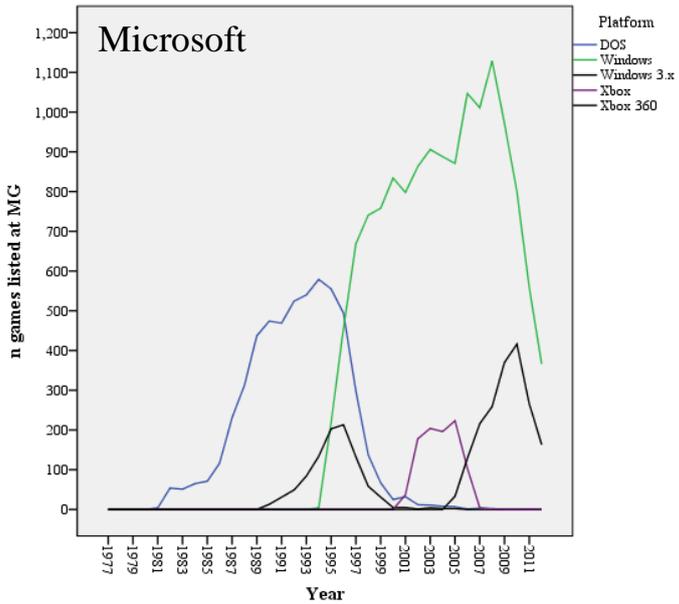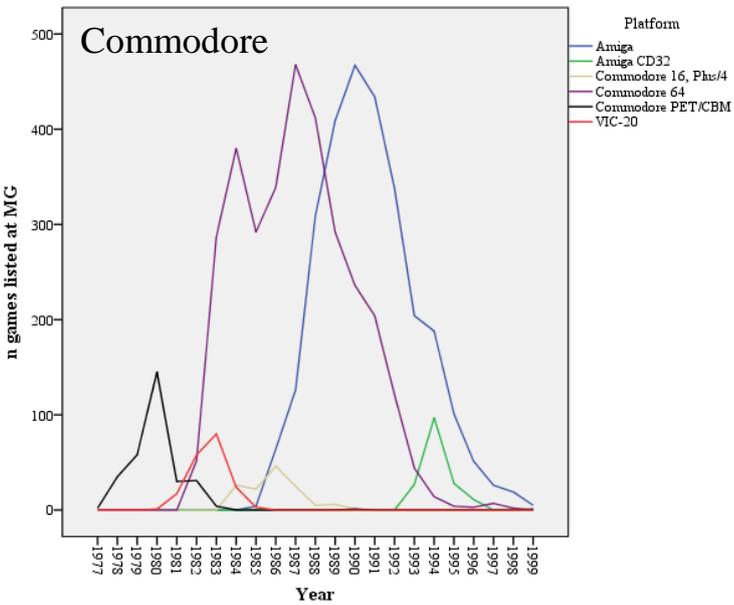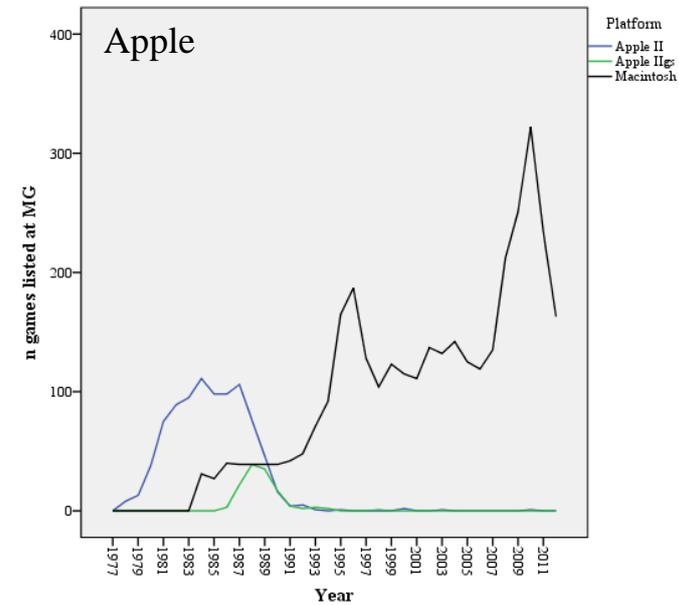
Figure 13. Dynamics of games released by platforms attributed to top 5 companies.

With three platforms by Nintendo in that list, it underlines the strategy of Nintendo to license game franchises specifically for their own platforms. Windows-based as well as DOS games are also quite dedicated to that platform (see *Figure 7B*), suggesting that the PC gaming system is the most popular to create new games for throughout the decades. However, in general from 2007 on, the games listed at MG are less and less dedicated to any platform, with games again released on multiple platforms at the same time, just like in the 8-bit era. Indeed, while the Xbox titles became more unique from the Xbox (15%) to the Xbox 360 (28.9%), the PlayStation platform became less dedicated from the PlayStation (42%), PlayStation 2 (36.4%) to PlayStation 3 (10.9%), with increasing number of games. It remains to be seen if that phenomenon will continue with the next generation of consoles.

Impact platforms. When ranking impact platforms according to the average number of games released per year, and the total number of games released ever the top 5 platforms are, in order of ranking (*Table 4*): Windows, DOS, PlayStation 2, Xbox 360 and Commodore 64. Though this ranking is a very rough estimate, it does further show the continued prominence of game platforms based on Microsoft OS, with Sony and Commodore sneaking in the top to complete the list.

"Market shares". When platforms were ranked under their producers (companies) about 39% of all 59936 games were also listed for Microsoft, 12% for Nintendo, 11% for Commodore, 11% for Sony and 7% for Apple. Taking only the 20700 unique games released on a single platform, these percentages are 56.8%, 15.0%, 5.3%, 10.0% and 1.46% for Microsoft, Nintendo, Commodore, Sony and Apple respectively (data not shown).

Gaming eras. In the 1980s the game industry was crowded with 11 major companies battling it out, with Sony only jumping in the market in 1994. At the turn of the millennium only 5 remained, of which Sega also had to fold in 2003. Today the market is defined by gaming platforms based on Microsoft OS, Sony, Nintendo and Apple. The PC seems always one step ahead of the consoles and is not likely to be overthrown any time soon. The next gen consoles will continue the fight, but focus on different audiences. The PlayStation platform seems to become more of a console where you can play games you can also play on other platforms, with hardly any PlayStation dedicated titles. The Nintendo consoles are continued aimed at a kids and family market with hardware (new controller for Wii U, 3DS) to set them apart from the others, and franchises only available for those consoles, especially the hand helds (e.g. Mario, Zelda etc.). The Xbox seems to go somewhere in the middle, but there is an increase in Xbox specific titles.

Issue at MobyGames or big drop in games? The dramatic drop in number of games released from 2009 onwards according to MG (2624 in 2008 to 1141 in 2012) is striking. This could implicate something is wrong with the data gathering at MG, and people contribute less and less. Either that or the market is really declining. But

that seems unlikely taking in mind the big boost of the Indie game industry and continued new releases.

Final words and limitations. There are new players coming up (e.g. Valve), and this review left out the games market for the tablets. Things might look a little different if the tablets were included. Importantly, the data at MG is hardly collected in a controlled manner, and only recently (a few years back) a review process was set up. There can be a lot of bias and contamination in the data, as well as incomplete data. Some preliminary sampling does suggest existence of double entries at MG and underreporting. Such a qualitative analysis is beyond the scope of this paper, but can affect the overall outcome. As this review is not aimed to be the final word on the matter, but more descriptive in nature, caution is advised to draw any solid conclusions. I will also release the raw data that I used for anyone to take a crack   at.

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Data taken from MobyGames

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