Aspects of High-Rated Games

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Abstract—As the video game market grows larger, it becomes harder to stand out from the crowd. Launching a successful game involves different aspects. But what are they? In this paper, we investigate some aspects of the high-rated games from a dataset of 200 projects. The results show that the none of the aspects of this study have a strong relationship with the game’s success. A further analysis on the high-rated games shows that team, technical, and game-design aspects should be the main focus of the game developers.

Index Terms—software, video-games, development, success, project

I. INTRODUCTION

The game industry has generated US$174bi in worldwide revenue in 2020. This is a growth of 19.6% compared to the past year. While this shows the video game market is growing, this does not mean every game partakes on this.

The game market is large. Platforms such as Steam receive hundreds of new releases every month. Standing out from this crowd and making a profit from a game is a hard endeavour. A recent example of the difficulties in developing a video game is the case of “No Man’s Sky”. Crowdfunded and produced by the indie studio “Hello Games”, it suffered strong criticism for not delivering promised features [1]. Similar situations also happen with AAA studios, as in the cases of “Aliens: Colonial Marines” [2] and “Cyberpunk 2077”.

Pondering on the influence of various factors on a game’s success, in this paper, we aim to answer the following research question: Which aspects better describe high-rated games? To do so, we collected data from 200 video game projects and analyzed a set of different aspects: team size, levels-of-independence, game genre, game mode, game platform, graphical perspective, and problem types. We compare each one of these aspects with the game’s score classification: high-rated and low-rated games. In this work, we use the dataset of 200 video game projects and its problems presented by Politowski et al. [3]. Besides the problem types, all other aspects are new. They were gathered through project postmortems and search on publicly available resources.

Postmortems are used by game developers to share information about their projects in the form of “war stories”. These informal texts summarize the developers’ experiences with their games, and are often written by managers or senior developers [4], [5] right after their games launched. They often include sections about “What went right” and “What went wrong” during the game development:

• “What went right” discusses the best practices adopted by the game developers, solutions, improvements, and project-management decisions that helped the project.

The ratings of the games serve as a proxy for its success. They are a relevant measure of success both by the public and the game industry. For game studios, high ratings mean good sales and also potential financial incentives.

The results show that none of the aspects bear a strong relationship with game success. A further analysis on the high-rated games confirms a previous study [3] which states that team, technical, and game-design aspects should be the main focus of the game developers.

The paper is structured as follows. Section II describes the methods of data collection and inference. Section III discusses the results we found by analyzing the dataset and the relations between its variables. Section IV discusses the results. Section V lists the threats to validity. Section VI shows the related works. Section VII concludes the paper and discusses future work.

II. METHOD

This work uses seven aspects to analyze the projects in the dataset: team size, levels-of-independence, game genre, game mode, game platform, graphical perspective, and problem types. We compare each one of these aspects with the game’s score, our main metric. We divide the projects according to a score classification: high-rated and low-rated games. In this work, we use the dataset of 200 video game projects and its problems presented by Politowski et al. [3]. Besides the problem types, all other aspects are new. They were gathered through project postmortems and search on publicly available resources.

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• “What went right” discusses the best practices adopted by the game developers, solutions, improvements, and project-management decisions that helped the project.

*For example, in 2012, Chris Avellone, the creative director of the open-world RPG “Fallout: New Vegas”, declared the publisher “Bethesda Softworks” refused to pay a bonus to the studio “Obsidian Entertainment” because the game missed the target Metascore of 85 by 1 point (https://bit.ly/31L0L6t).
• “What went wrong” discusses difficulties, pitfalls, and mistakes experienced by the development team in the project, both technical and managerial.

A. Score

We used Metacritic’s Metascore\(^5\) as the main rating source. These ratings were manually collected from the site, using its search functionality. However, not all games from our list had this score. A minimum of 4 user ratings is needed for the Metascore to be generated and, in the case of less popular games, this number is often not reached. In such cases, we used digital game store ratings as a replacement. For games available on PC, we used Steam as the primary source. Apple App Store and Google Play were also queried when the game in question had mobile versions.

The ratings were normalized considering a 0-100 scale. So, for rating systems that considered 1-5 stars (e.g on Google Play or review websites), 5 was considered equivalent to 100, and the relative score was obtained through cross multiplication.

Steam has no numerical rating system, so we considered the ratings from Google, which converts the Steam rating system to a 1-10 scale. We discovered this relation by observing how results are displayed on Google and what “label” is given by Steam to this same rating. It goes as follows:

- 100 = Overwhelmingly Positive
- 90 = Very Positive
- 80 = Positive
- 70 = Mostly Positive
- 60 = Mixed
- 50 = Mostly negative
- <40 = Very/Overwhelmingly Negative (we found no games in this category)

B. Team size

The exact number of members in the team was found in 170 of 200 postmortems. For the remaining 30 projects, we inferred the number based in the postmortem author’s description and information we could find in other sources.

For example, when there was no data box in the postmortem\(^6\) we considered the numbers cited in the text. If the developer stated or implied the game was done solo, the team size was considered as 1.

If there was no exact number in the text, we looked for sources in other media, like articles or press releases. For example, for the data from the game’s credits in the MobyGames repository\(^7\), the number of developers credited was considered.

Finally, if no data was found in the media outlets, we only considered the postmortem statements. For example, when the postmortem author implied the team size, describing it as “small” or “large” or any other size definition. However, this information alone was not used as a verdict to decide the team size of the project. For example, for attesting a group as “small”, we considered evidences such as the project being “indie”, being sold by a small price, or getting little to no media attention.

C. Levels of independence

We adapted the framework defined by [6], which delimits creative, financial, and publishing independence. We defined a metric called level-of-independence to represent how much freedom the development team had. From zero to three (0-3), the bigger the number, the more independent the project is. For example, projects that present creative, financial and publishing independence have a sum of 3 and therefore are categorized as the “most independent”. We categorized projects which describe no types of independence (sum equals zero) as “least independent”. Other cases were categorized as “partially independent”.

a) Creative independence: When the game was self-published or when the PM author stated the creative director or development team as a whole had freedom to propose and execute their own ideas, we considered the game as creatively independent. The same was applied when the game was a sequel or expansion and the author stated that they added significant amount of new functionalities. However, if the game described in the PM is a port, a continuation that was not regarded by its creators as a significant evolution in the franchise, or when the PM author mentioned creative conflicts between developers and publishers, we considered the project did not have this type of independence.

“Armed now with a proprietary game engine, a robust tools pipeline, a talented and experienced staff, and the creative freedom and corporate mandate to innovate.” – Brutal Legend by Caroline Esmurdoc

b) Financial independence: We considered the project had financial independence if the team used their own resources to fund the development of the game. In the case of a single person or group of individuals, these resources may be personal earnings, savings, or credit. In the case of a company, the funding may come from crowdfunding, previous games sales, services provided to other parties, or from a parent company. External funding, coming from entities such as angel investors, government grants, contractors or third-party publishers does not qualify the game to be considered financially independent. Finally, when there was no comments regarding the origin of funding, we inferred the game was self-funded if it was also self-published. Otherwise, we inferred the project was financially dependent on its publisher.

“We decided to partner and fund the game with our own money. In the end this has worked very well, because we managed to do a good looking game in the time we had, and with scarce resources.” – NyxQuest: Kindred Spirits by Rob de Lara

\(^5\)https://www.metacritic.com/about-metacritic
\(^6\)Summary that appears at the end of some Gamasutra postmortems.
\(^7\)MobyGames is a video game data repository created in 1999 that “has amassed a database of over 33,000 games, comprising information including developer credits, screenshots, trivia, release dates, platforms and aggregated reviews” (https://bit.ly/3mG0mk6)
c) Publishing independence: If the game was self-published, we considered it had publishing independence. When the publisher is a parent company of the studio which developed the game, the same assumption was made. When the game was published by a third-party company, the project was not considered independent of publisher.

“As a self-publisher it’s key to invest in relationships – there are ten million other games out there so you can’t expect everyone to immediately realize why YOUR game is so special compared to everyone else’s. You have to make your case well and respect your partners to get traction when you’re an indie developer.” – Knightly Adventure by Doyon Kim

D. Game genre

The base game genre list was defined using the same classification used by [3] and the genres for each game were obtained on Wikipedia. When the genres listed on Wikipedia were not on the base list, they were inferred based on the definition given by the postmortem author through examples on text or screenshots. When Wikipedia listed more than three genres for a given game, we chose to keep only the first 3, to avoid excessive segmentation.

E. Graphical perspective

For the perspective analysis we are not considering the graphical projection rendered by the game engine, but the game-world view as experienced by the player. For this matter, 2D games created on a 3D engine are considered 2D on our analysis. For 2.5D, we followed the definition of [7], in which “2.5D is a simplified 3D (x,y,z) surface representation that contains at most one depth value (z direction) for every point in the (x, y) plane”. Therefore, any game that allows you to view a 3D through only one point of view (fixed-angle camera) is considered 2.5D on our analysis.

F. Platform, game modes and problem types

The platform, game mode and problem type analysis also followed the same classification used by Politowski, Petrillo, Ullmann, et al. [3]. Platform types are PC, console and mobile, the latter encompassing projects designed for all kinds of handheld devices. For the game modes we considered singleplayer, multiplayer (which encompasses local network or multiple controller play only) and online (which encompasses Internet multiplayer only). The problems types consist in a list of 20 items, grouped in 3 categories (production, management and business).

G. Investigating “What went right” (WWR)

We analyzed the “What went right” (WWR) section of the PMs for each one of the high-rated projects projects, collecting quotes that better summarized the strongest points described by the authors.

After gathering these excerpts, we related them with the problems types they described. These problem types were the same ones defined by [3] for the dataset, and we assigned multiple problems by excerpt based on what most closely related to the postmortem author’s description.

For postmortems that do not have a clear division between “What went right” and “What went wrong”, we have considered the entire text but only collected quotes that described factors that described solutions or factors for success and not problems.

III. RESULTS

This section shows the general analysis of the dataset. None of the variables seem to explain the game’s success. However, there are some minor findings described in the following sections.

A. Score (rating) analysis

The score variable has a minimum value of 40 and a maximum of 97. The median is 79, which indicates that higher ratings are the most common in the dataset. The mean value is 74.88 and the standard deviation is 14.14. The values below 45 are considered outliers. These occurred only for a few games for which no rating information could be found.

According to its score, the games were divided two groups: high-rated and low-rated. This division was made using the boxplot quartiles as reference (Figure 1). Projects with scores greater than 85 (Q4) were considered high-rated, while the remaining were considered low-rated. Therefore, out of 200 games, 48 were high-rated and 152 low-rated.

B. Team size comparison

The Figure 2 shows the team size of the projects. For the low-rated games, the median team size is 11, while for the high-rated ones it is 20. Yet, there are more outliers (above the Q4) for the low-rated games.

C. Levels-of-independence comparison

The Figure 3 shows the levels-of-independence of the projects – zero means less independent while three means more independent (indie). In this case, low-levels of independence (levels 0 and 1) occur slightly more frequently on high-rated games. On the other hand, high-levels of independence (levels 2 and 3) occur slightly more frequently on low-rated games.
FIG. 2: Project’s **team size** of the high-rated games in comparison with the low-rated ones.

FIG. 3: Game **level-of-independence** of the high-rated games (dark bars) in comparison with the low-rated ones (gray bars).

**D. Genre comparison**

The **Figure 4** shows the comparison of the games, i.e. high-rated and low-rated, according to its **genre**. **Shooter**, **rpg**, or **simulation** titles are the most prone to success, while **action**, **adventure**, **strategy**, and **platform** games are the opposite.

**E. Game mode, platform, and graphical perspective comparison**

The **Figure 5a** shows the game **modes**, **single-player** games are the most common, followed by **multiplayer**. There are very few occurrences of **online-only** games in the dataset. **Multiplayer** games occur slightly more frequently among high-rated than low-rated games.

The **Figure 5b** shows that the **PC** is the main **platform** for games in our dataset. On **PC** the high-rated games are slightly more common. The opposite of what happens in **console** and **mobile** platforms.

The **Figure 5c** shows the graphical **perspective** of the games. 3D games are slightly more common high-rated than in low-rated games.

**F. Problem types comparison**

The **Figure 5d** and **Figure 5e** show the **management** and production **problems** respectively. The most frequent problems, regardless of rating, are **team**, **planning** and **communication** (management); **design**, **technical** and **tools** (production). The proportion of problems regarding project **scope**, **delays**, **budget** and **crunch-time** is slightly larger for low-rated games.

**Results’ summary**

Most of the successful games in the dataset are 3D shooters, RPGs or simulations, available for PC in both single and multiplayer mode. These projects usually have teams ranging from 10 to 20 developers. Also, the problems in high-rated and low-rated games are similar. Finally, the freedom developers have does not correlate to better games.

**IV. DISCUSSING “WHAT WENT RIGHT” (WWR)**

This section explore, with further details, “what went right” (WWR) among the high-rated projects. The **Table 1** shows the main aspects that “went right” among the high-rated projects. We also compare it with the all the aspects that “went wrong”, that is, the problems. The results shows that the main aspects that went right and issues that went wrong are similar. This corroborates with previous findings [3]. Therefore, **team**, **technical**, and **game-design** aspects should be the main focus of the game developers.

**WWR#1. Team aspects**

Among the details related to the **team**, **teamwork**, **experience**, and **communication** are the characteristics developers cite the most. Others like **familiarity with technology** and **project’s vision** are also important for the team’s success.

“Several members of the programming team had worked together on previous Westwood RTS products...
TABLE I: The main aspects from the “What Went Right” (WWR) sections among the high-rate games. In the right, the problems from the “What Went Wrong” (WWW) sections [3], considering all the 200 projects.

| Aspects           | WWR (high-rated) | WWW (all projects) |
|-------------------|------------------|--------------------|
| Team              | #1 (60%)         | #3 (08%)           |
| Technical         | #2 (54%)         | #1 (11%)           |
| Game Design       | #3 (42%)         | #2 (11%)           |
| Planning          | #4 (21%)         | #5 (07%)           |
| Marketing         | #5 (19%)         | #6 (06%)           |
| Prototyping        | #6 (13%)         | #18 (02%)          |
| Testing           | #7 (04%)         | #8 (05%)           |

and were accustomed to each other’s coding styles.”
– Command and Conquer: Tiberian Sun by Rade Stojsavljevic

WWR#2. Technical aspects

Game studios often decides to keep using technologies they are familiar with, especially when it comes to developing sequel to successful titles. Examples are Baldur’s Gate II, Descent 3, and Galactic Civilizations 2.

“Much of the joy of working on a sequel comes from the fact that you can improve on an already established title, and in many cases, add features that were previously impossible to do. (...)” – Descent 3 by Craig Derrick and Jason Leighton

WWR#3. Game-design aspects

Game-design is a broad issue. However, many of the high-rated projects cite the search for a “concise vision”, “core game design” or “blueprint” as the main element to be addressed. Examples are Bioshock, Splinter Cell, No One Lives Forever and Startopia.

“A past history of successful games did much to strengthen the belief that Startopia’s design was an accurate blueprint for a fun and enjoyable game. This highlights the importance of a strong credible design blueprint at the early stage of game development.” – Startopia by Wayne Imlach

WWR#4. Planning aspects

The high-rated projects describe their scheduling as “flexible” and “iterative”, praising their ability to quickly adapt and correct mistakes. Also, having enough time to finish the game as intended is important. For example, Diablo II’s PM cites the team made sure the game was “as good as it can be before we ship it” and Prune’s PM author says that “Having the luxury of time allowed me to eventually find the soul of the game”.

“Perhaps Naughty Dog’s most important achievement is making large-scale games and shipping them on time, with at most a small amount of slip. (...) we prefer a much more flexible, macro-level scheduling scheme, with milestone accomplishments to be achieved by certain dates.” – Uncharted:
WWR#5. Marketing aspects

On marketing, the main elements of success among the high-rated games are advertising early, creating a strong online presence and focusing on understanding the characteristics of the target public. Also, getting help from experienced business partners and specialists is an effective way to create solid distribution, pricing and sales strategies.

“One of the best decisions we made was teaming up with Take 2. (...) For Galactic Civilizations II, they were the distributor, not the publisher. Their job was to take our game and put it into stores. (...) We also hired Brian Clair, who had been running Avault.com for many years to be in charge of our publishing efforts. Combining him with Take 2 resulted in having a first week sell-in to retail that was 3 times what the original had.” – Galactic Civilizations 2: Dread Lords by Brad Wardell

WWR#6. Prototyping aspects

According to the high-rated projects, prototyping early and quickly is the action to reach success. Finding a solid vision and shaping it through iteration is also important. The postmortems for Guacamelee, Deus Ex, and Prune suggest to keep the team lean and free to experiment during the early iterations.

“Although questions remained, the game was well defined. This was accomplished using a small group and rapid prototyping, with the freedom for people to try different things.” – Guacamelee by Chris Harvey

WWR#7. Testing aspects

QA and testing teams take relevant part for either small and large games. Testing might also involves end-users, which can help creating a community, as the postmortems from Myth: The Fallen Lords, Dark Age of Camelot, Bionic Commando Rearmed, and Armadillo Run recommend.

“There’s no big quality assurance department here at Bungie; the public did our testing for us, and we listened to them as seriously as if they were coworkers on the project.” – Myth: The Fallen Lords by Jason Regier

Discussions’ summary

The main suggestions from high-rated projects are: follow a well-defined design vision, take the time to develop the game, and control the game scope. As for the development team, technical skills (experienced and well-balanced team) as well as soft skills (close-knit team) are equally important.

V. Threats to Validity

Score: The game ratings were collected from multiples sources that used different scales. Normalizing these values to a common scale is not as precise as using only one source.

Team size: Not all sources of information offered a precise description of their teams, in terms of numbers and composition. While some focused in describing mostly technical personnel or key people to the project (e.g. leads and managers), others cited people from a broad range of positions and departments.

Levels of independence: Many postmortems refrain from discussing all phases of the project in detail and frequently offer vague information related to specific management and financial decisions. Therefore, it is possible that the occurrence of financial and creative independence could be wrongly inferred.

Game genre: Given the fact that any game could be classified into one or more genre or sub-genres, our genre definitions cannot be taken as absolute.

Graphical perspective: Considering that there is no standard definition for graphical perspective in the context of games, our classification cannot be taken as absolute. Some games could even fit more than one definition (e.g: switching between 2d and 3d view).

VI. Related Works

Many works have analyzed the factors of success for games through distinct approaches. Empirical studies, for example, evaluate marketing, monetization, brand and customer service strategies [8] [9], as well as company organizational structure, location [10] and publishing plan [11] to infer the success of its projects.

Other studies investigate success from the point of view of the public and critics, analyzing scores provided by specialized websites such as Metacritic or Gamespot [12], as well as Steam text reviews written by players [13]. The latter is analyzed in conjunction with the reviewer’s playing hours as a way to infer the level of player engagement.

By studying failure/success cases through postmortem documents [14] or analyzing a specific area of game development such as QA [15], some works also aim to describe good practices or even propose completely new project frameworks, built to avoid mistakes that occur in well-established approaches [16].

Some works used the “what went right” sections in the postmortems to create a set of good practices. First, Petrillo and Pimenta [14] made a parallel with the agile practices. Later on Washburn, Sathiyanarayanan, Nagappan, et al. [5] also created a list of the most common practices.

VII. Conclusion

This paper investigate which aspect better describe the high-rated game projects. We collected data from 200 video game projects and analyze a set of different aspects: team size, levels-of-independence, game genre, game platform, graphical-perspective, game mode and development problems.
We also collected numeric ratings for each game using Metacritic and other review aggregators. We use this data to investigate which of these aspects affect the success of the games.

The results show that the none of the aspects have a strong relationship with the game’s success. A further analysis on the high-rated games confirms previous study [3] were team, technical, and game-design aspects should be the main focus of the game developers.

Future works we should investigate how to apply better practices to the game development. For example, how to distribute the skill expertise of the team? Does it change depending on the game genre? How to keep a design vision given the iterative nature of the game development? There are many challenges that will require specific studies to address it properly.

VIII. ACKNOWLEDGMENTS

The authors were partly supported by the NSERC Discovery Grant and Canada Research Chairs programs.

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