

Evaluating the Successful Factors of Arknights as a Mobile Gacha Game with GameFlow

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Abstract. GameFlow is a widely used model of player enjoyment, with numerous applications to game designation and evaluation. Derived from a general set of heuristics for creating enjoyable player experiences, GameFlow has already become a general model of player enjoyment, suitable for all kinds of game genres and platforms. However, research so far has been focused on traditional mobile games while gacha game has not received enough attention. Arknights is a famous gacha games released in 2020 worldwide. This study evaluates how Arknights grows into one of the most successful mobile gacha games and IP in recent years, using the GameFlow model as a conceptual foundation. One reason is that designers of Arknights are good at dealing with the balance between game challenges and increasing players' skills. In other words, the complexity management of Arknights is pretty good. Another one is that players can get high concentration and immersion due to Arknights' excellent auditory and visual experience. The two advantages behind the success of Arknights are worth studying for global mobile game industry.

Keywords: Arknights; story; gacha; GameFlow.

1. Introduction and Method

GameFlow is a model of player enjoyment, including 38 criteria within eight elements (Concentration, Challenge, Player Skills, Control, Clear Goals, Feedback, Immersion, and Social Interaction)[1]. GameFlow was originated from games user experience heuristics and mapped to the factors of Csikszentmihalyi's concept of flow[2]. Since the publication of the GameFlow model, it has seen extensive use in the designation and evaluation of games and game-like experiences, as well as other related areas. Besides, the GameFlow model has been used to design and evaluate games for a variety of platforms, including mobile games [3, 4], console games [5], and VR games [6]. New models have been derived from the original GameFlow model, including EGameFlow [7], MIU-GameFlow [8] and Pervasive GameFlow [9]. The GameFlow model has also been evaluated in the literature. The inclusion of the Social Interaction element has been argued and tested [10]. There are other researches like the GameFlow model's connection to flow [11] and the relationship between Social Interaction and Immersion[12].

A gacha game is a video game that implements the gacha (a toy vending machine) mechanic. Similar to loot boxes, in gacha games, players pay virtual currency which is bought with real money or acquired in-game to acquire random game characters or pieces of equipment of varying rarity and usefulness. Most Gacha games are free-to-play mobile games. The gacha model began to be popular in the early 2010s in Japan. The game mechanism is also widely spread in Chinese and Korean games, as well as Western games. Some research focuses on the pattern of F2P gaming and gambling[13,14]. Some people evaluated the design rules for F2P games[15]. Until today, gacha game has become one of top money-making mobile games in Asian countries. Gacha mechanics have become an integral part of worldwide mobile game culture. Some famous gacha games can be turned into highly profitable IP in ACGN industry. Despite the many uses and applications of the GameFlow model, there is little research that attempts inquiry into the field of gacha games. Given the prevalence and significance of gacha mechanics, it is important to take gacha mobile games into consideration discussing GameFlow model.

The article promises to provide well-rounded and detailed insights into how the GameFlow criteria are shown in gacha mobile games taking Arknights for example, as well as experience for designing similar gacha games to enhance enjoyment.

2. Analysis and Discussion

2.1 Hypergryph's Biggest Success: Arknights

Arknights is a mobile tower defense (TD) game developed by Hypergryph(Shanghai, China), originally released in mainland China on May 1, 2019. It received a release in Japan, Korea, North America, Europe, and Southeast Asia by Yostar on January 16, 2020. It turned out to be the best-selling game in 2019 and world wide players have highly praised the stories and art style presented by it.

As a mobile game, Arknights has received great commercial achievements. Gamma Data, also referred to as CNG or CNG(New Game Research) is a Chinese research institute specializing in video games, movies and television programmes. According to Gamma Data's 2019 discovery, the revenue of Arknights for the first month after the release was over 600 million RMB, which turns to be a great success for a newborn gacha game.

According to Sensor Tower, 9 months after launch, Arknights' revenues were very stable by gacha standards. Arknights made \$170M net of apple/google fee from Nov.2019 to Nov.2020. This excludes revenues made in China, with probably add another 30 to 50%. Revenues from western countries are around \$30M, with \$22M in the US alone. Strong asian market and successful global launch means Arknights is just beginning its exploitation phase. Four years later, Arknights is still going strong. According to Sensor Tower, until May 2023, Arknights' total overseas income has surpassed \$600 million. Arknights has also won the Best for Google Play Games on PC 2023.

Hypergryph spends lots of efforts on manga and anime making as a supplement to the mobile game. There are a variety of comics with high quality illustration and storytelling skills like The Arknights Comic Anthology and A1 Operations Preparation Detachment. As for animation, Prelude to Dawn is the first anime adaptation of Arknights produced by Yostar Pictures released in 2022. Perish in Frost is the second one which was released in 2023. The transformation among animation, comics, games and novels is a traditional and irresistible method for successful promotion of an IP in the field of cultural industry. Arknights features its own soundtrack, which includes background musics and promotional music or songs produced specifically for the game. Ambience Synesthesia is a series of real-world concerts featuring Arknights' music, held under the oversight of Hypergryph (as Monster Siren Records) since 2021. It has already been a auditory banquet for players very year with high incomes and reputation. Ambience Synesthesia 2023 Wanted has won the Hollywood Music in Media Awards (HMMA) under Live Concert for Visual Media.

As for the contents of Arknights, it is set in a post-apocalyptic world named Terra where a disaster known as the Originium has caused a global collapse of civilization, leading to the emergence of a new era of technology and magic. Players take on the role of Doctor as specialist in the field of Originium who leads a team of Operators in combat against various threats. Players belong to Rhodes Island Pharmaceuticals Inc., commonly known as Rhodes Island (R.I.). Made up almost exclusively of the Infected, R.I. legally operates as a pharmaceutical company that provides care and treatment to the Infected. There are a variety of countries and regions on Terra which originate from real world. As far as race is concerned, Terra is populated by various races which resembles the homo sapiens of earth, but with physical traits from various animals, legendary creatures, and mythological beings. They can be considered humanoid or anthropomorphic. These are Operators. Arknights utilizes a gacha system for players to obtain the Operators.

The basic information of Arknights is stated above. This study tries to evaluate the successful factors of Arknights as a mobile gacha game with GameFlow. The following two aspects may account for the success of Arknights.

2.2 Challenge and Player Skills

P. Sweetser and P. Wyeth put forward a point of view that games should be sufficiently challenging and match players' skill[1]. Games should provide different levels of challenge for players of different levels. Through the game playing, players should experience progresses and increase their skills. In the case of Arknights, the strategy of distributing missions reaches the balance between increasing players' skill and challenges set-up which can arouse the interest and skills of players at the same time.

2.2.1 The Main Gameplay of Arknights: Tower Defense and Gacha System

Gacha games has a variety of genres. The methods of combining gacha mechanics and game contents are diverse. For instance, Dragon Collection, the first popular Japanese gacha game, released in 2010, belongs to card battle. Fate/Grand Order uses tactical role-playing. The famous Genshin Impact is of open-world action role-playing. As for Arknights, it is tower defense.

Tower defense is a sub-genre of strategy games where the goal is to defend a player's territories or possessions by obstructing the enemy attackers or by stopping enemies from reaching the exits, usually achieved by placing defensive structures on or along their path of attack. This typically means building a variety of different structures that serve to automatically block, impede, attack or destroy enemies. Tower defense is seen as a sub-genre of real-time strategy video games, due to its real-time origins, even though many modern tower defense games include aspects of turn-based strategy. Strategic choice and positioning of defensive elements is an essential strategy of the genre. Arknights is the first popular gacha games utilizing tower defense. It is common sense that tower defense is a kind of rather challenging game genre which means Arknights can deal with mission distribution in a smarter way than other gacha game.

The main gameplay of Arknights involves players assembling a team of Operators with unique skills and abilities and deploying them on tactical missions. Each mission requires players to navigate through a series of obstacles and challenges, including enemy units, environmental hazards, and various traps. Players must make strategic decisions in real-time, managing their resources and deploying their Operators effectively to achieve victory.

While it first appears to be a deceptively simple tower defense, Arknights is usually more difficult than the run-of-the-mill tower defense game due to tricky maps and enemy design, and provides challenging combat puzzles. A strong aspect of the game is the management of the player's Operators and correct use of their abilities to achieve victory. Arknights also features the important base building feature. Arknights utilizes a gacha system for players to obtain the Operators. However, the game has designed stages to be solvable using Operators of the most common rarities. Additionally, the Recruitment system permits the free, albeit rare acquisition of most of the oldest high rarity Operators.

Arknights is mostly a single-player puzzle game, each level of the game has at least one set solution to beat it. The characters that players can roll for in the gacha system are the units they place down to beat the incoming swarm of enemies. Each character has a unique set of abilities and are divided into classes, like medics or snipers. The thing about Arknights that makes it so nice is that each level can be completed using the low-rarity units. At the same time, it can be amazing that gameplay can be quite challenging designed to be beaten by low-rarity units. While power and ability creep happens with meta-breakers like Surtr or Thorns etc. But they are never required for the majority of content. Further rewards are never gated such that players need a specific super-rare six-star unit because they just make things easier. Thus, it is not necessary for ordinary players to spend money on gacha system.

2.2.2 Complexity Management in Arknights

For game designation, it is hard to manage complexity. The problem is that increasing complexity is likely to mean that the workings of the games or simulations are harder to understand.[16] But Arknights has a delightful complexity management. For players, there is

something satisfying about being stumped on a hard level, not knowing how to beat a new boss or get past a certain wave of enemies, and then figuring it out. Besides, the game does not see new levels or events often, so that downtime can be used to take a break from the game or farm materials to power up characters. The steady addition of new content is reasonable, and potentially a little overwhelming if players invest in the optional character interludes. Arknights keeps a fairly reasonable requirement for engagement without feeling overly burdensome.

Tons of other gacha games have a multiplayer competitive element to it, forcing players to roll for new gacha units to avoid being left behind. However, Arknights' only multiplayer features involve helping out friends by letting them borrow one's own units or sending them items they need to earn some cash. There isn't anything competitive, and players who do not have the game's rarest units are not dragging their friends down.

With a bit of grinding and powering up, players can effectively beat the hardest levels in Arknights with nothing but low-rarity characters. Furthermore, optional challenge is often available in things like Contingency Contract and rogue-like events for players with more powerful teams to freely experiment with. The game's difficult Contingency Contract events do shake this up a bit. Only players with the rarest units will be able to beat the hardest levels, but a majority of players are able to get the event rewards, as long as they power up their characters. While the last few levels of Contingency Contract will be too tough for most players, the only thing players will miss out on are bragging rights.

Arknights is also fairly straightforward. Players can level up the characters, but there is no extra additional things for them to have to funnel materials into. Games like Genshin Impact or Granblue Fantasy feature summons, weapons, and other equips for characters that players also have to level up. If players want a strong team, they will have to put a ton of time and energy into making sure they do not only have a strong character, but a strong summon and a strong set of weapons. While these games overwhelm player with a seemingly endless list of things they will be powering up for the rest of natural life, Arknights only has characters and their skill levels to upgrade.

It is concluded that Arknights takes itself seriously as a narrative, pursues reasonably fair gameplay. Although it is admittedly still infested with the filth of gambling gacha but not to the exploitative measures of games that require necessary meta-chasing to keep up with the power-creep. Gameplay feels strategic but not in the way a lot of games make players figure out the optimal gear stat and character combo. Therefore, Arknights can provide appropriate and adequate challenges to players. The process of promoting players' skills is subsequently interesting.

2.3 Concentration and Immersion

One of the most important criteria of GameFlow is concentration and immersion[1]. Games should provide a lot of stimuli from different source. Besides, players should feel viscerally and emotionally involved in the game. It means a high-quality game should provide players with attractive auditory and visual experience. Actually, Arknights is good at telling a thought-provoking story with excellent visual art and auditory methods.

It seems that books are the ultimate medium for telling a story. But with the appearance of electronics like smartphone, ipad and so on, it is possible for readers to digest a multimedia story in an unprecedented method. In gacha games, players can encounter a touching story in the form of a combination of music, artworks and texts.

2.3.1 Auditory Experience: Eclectic Music, Cosmopolitanism and Multiculturalism

Arknights music selection is extremely eclectic. Tracks range from experimental jazz pieces to techno, pop and electro tracks, to rock music to symphonic music. For instance, Winter Absolution (Shining's Theme) is a symphonic piece with Latin chorus. Autumn Moods (Angelina's Theme) is more traditional kind of pop. Renegade (W's theme) belongs to rap. Classical music also matters. Several tracks are modern version of classics. For instance, Der Hexenkönig is adopted from Schubert's Erlkoenig. In some cases, a track can be a crossover of multiple genres, case in Near

Light's boss theme track. Arknights soundtrack has also attempted something more like an anthem piece straight out of a musical like Towards Her Light (Saileach's theme) and Silver Lining (Silver Ash's theme). Furthermore, Hypergryph takes the time and makes the effort to ensure that every event and so on gets its own music. It ensures that the music in question fits the theme of the event. This is not just lobby music, but also the music in the stages themselves.

Arknights show a tendency of cosmopolitanism and multiculturalism in language use. There are a variety of countries and regions on Terra which have their own archetype in real history. For example, Ursus comes from Russia. Yan origins from China. Iberia is an alter version of Iberian Peninsula. Siracusa is born of Italy. Leithanien derives from Austro-Hungarian Empire. Higashi represents Japan. Laterano is based on Vatican.

The official languages of Arknights are Chinese, Japanese, Korean and English. There are special dialects dubbing for Yan Operators. For instance, Ch'en, Lin, Swire, and Hoshiguma have Cantonese dialect. Besides, several Operators have their mother tongue. Siracusa Operators like Lapland and Texas the Omertosa have Italian dubbing. Lessing and Viviana who come from Leithanien have Germany dubbing. Ursine Operators like Hellagur, Absinthe and Poca have Russian dubbing.

Not every operator can use mother tongue. But most CV(character voice) will keep specific accent. For instance, Kazimierz in Arknights is based on Poland and various events and characters use Polish words. For example, the famous Kazimierz operator Młynar's English CV is Anthony Howell. He displays Polish accent and several Polish expressions in the dialogue.

2.3.2 Visual Experience: Stylish Visual Art and Solid Story

The visual art style of Arknights is also impressive. Hypergryph illustrators have spent efforts on keeping character consistency. Despite different artists, all characters fit with each other without egregious changes in art-style. Arknights keeps things uniform enough that even the tiniest goat-girl does not look out of place when next to a giant tiger-man. The UI (User Interface) designation is highly praised for the clean and upfront style. Taking Side Stoy Lone Trail as example, it is referred to loosely as NASA Punk. Its typeface would be ITC Avant Garde Gothic Demi Bold. The entire aesthetic revolves around the whitish cream colour with hints of red, orange and teal, as well as a focus on geometric shapes.

What really makes Arknights a successful gacha game is its highly literary story. One of Arknights's motif is the fight of the Infected, in other words, the struggle for justice and peace and the battle against discrimination and oppression. Oripathy is a progressive, terminal disease in the world of Arknights. The Infected are very common in Terra, owing to the fact that Originium, the primary cause of Oripathy, plays an important role in Terran industry and technology. The Terrans hold a deeply rooted hatred towards the Infected since ancient times, causing them to be systematically discriminated and marginalized by virtually all parts of the non-Infected Terran society. This ire most likely stems from the widespread belief that Oripathy is virulent. Although in reality, person-to-person Oripathy transmission is theoretically impossible as proven by various studies, which has went on for too long that it is very difficult to convince most of the Terrans otherwise.

Another important element in Arknights is Catastrophes and nomadic cities. Natural disasters of many types, from earthquakes to meteor impacts, occur much more frequently on Terra than on Earth and are referred to as Catastrophes, since such occurrences are cataclysmic in scale—often far worse than Earth's natural disasters. Despite the many forms Catastrophes can take, they all leave behind active Originium crystals, which are extremely dangerous and contaminate the affected area. Due to the threat of Catastrophes, most modern cities on Terra are nomadic cities. They are capable of moving its structures and inhabitants safely away from Catastrophes when necessary.

The deep lore and engaging storyline is presented through a series of campaign missions and character interactions. The game features a diverse cast of Operators, each with their own backstory and personality. Players are encouraged to build relationships with them through dialogue and

special events. The main story begins with the Chernobog crisis. The Ursine nomadic city of Chernobog is currently suffering a bloody riot led by Reunion Movement, a pro-Infected violent non-state organization. The chaos has spread across the city, and no one could escape from that. And a Catastrophe is on the road. Rhodes Island is involved in the riot trying to resolve any issue with peace by stopping the riot. And their first and foremost goal was to get the Doctor out from the city.

For the Rhodes Island rescue team, however, there is something worse than the Catastrophe. Standing in front of them are numerous skilled fighters and their leader: Talulah. All she wants to see is the common folks suffer the disease that the Infected have been bearing for ages.

Another crisis lies in the clash between Sarkaz and non-Sarkaz races which leads to the biggest war in Arknights. Sarkaz are more vulnerable to Oripathy than other races as part of their racial curse. This is seen as a bitter blessing that allows them to both enhance and resist Originium Arts, which gives them a unique strength among Terra's races. All Sarkaz trace their ancestry back to Kazdel, where they were called Teekaz in ancient times. The Sarkaz are said to be the genuine, original inhabitants of Terra who were expelled from their homeland after the invasion of other alien Terran races. To this day, Sarkaz are heavily demonized by other Terran races who depict them as blood-thirsty warmongers. Hence, racial discrimination against Sarkaz is very common in Terran society; they are called demons or devils as racial slurs and sometimes exempt from social welfare. Because Sarkaz are frequently dehumanized, some have become victims of exploitation and other crimes against humanity, such as human experimentation.

Far from Chernobog, in Londinium, the capital of the Victorian Empire, the signs of world war are becoming oblivious. After years of slowly spreading Sarkaz influence in Londinium and planting his loyalists into Victoria's defense force and aristocracy, Regent Theresis has finally secured his position in the Royal Court thanks to the support of several Sarkaz kings. Theresa, Theresis 's sister, the former Sarkaz King of Kazdel, has also been resurrected thanks to the Arts of the Confessarius. However, it seems she is intended to be used as a puppet for the Regent in order to rally the Sarkaz.

After being invited by a Grand Duke to pacify the civil revolt, Theresis has been actively building up his military there. He has ordered the reconstruction of the Shard into a gigantic Catastrophe manipulator and the building of an airship fleet around the tower. He has also redesigned the function of Londinium's defense artillery system, made up cannons built around the city's outer walls with the ability to automatically track targets, to face inward instead. His ultimate wish is to launch a world war against all nations of Terra to end the Sarkaz's never-ending disunity and restore Kazdel's former glory. In this way, Theresis becomes the most important antagonists in the main theme.

The main story of Arknights feels like real dystopia. War and riot of varying sizes constitute the background of Arknights. Ethnic hatred and discrimination are underlying theme. Thus, understanding and lenience is extremely precious in miserable Terra. As the game name suggests, Doctor and Operators are knights of Ark, bringing peace and hope to the suffering people, seeking a brighter future and positive reformation. Rhodes Island show its idealistic tendencies in a series of events.

In addition to the main story, Arknights offers stories in a variety of forms, like Intermezzo stories, Side Story stories and Vignette stories. They are related with the main story but own their telling style and figures which serve as supplements to the main story. Near Light trilogy, Stultifera Navis and Darknights Memoir are all excellent side stories. Darknights Memoir (DM) is the fifth major event and first Intermezzo in Arknights. Released on April 21, 2020, DM serves as a bridge between Chernobog crisis and Sarkaz issue in the game. In DM, the relationship among Rhodes Island, Babel and Kazdel is shown to the players. The miserable history of Sarkaz preludes the later warfare lit by Theresis which accounts for most part of Victorian story. The struggle life of Sarkaz mercenaries like W and Hoederer is clearly described. All in all, DM is regarded as a highly literary story in Arknights.

In a word, Arknights's core is serious and solemn literature under the surface of a gacha mobile game. With its unique blend of strategy gameplay and engaging storytelling, high-profile music and skillful art-style, Arknights has attracted players' concentration and immersion, earning it critical acclaim and a loyal fan base.

3. Summary

The Chinese mobile game market has been on a trajectory of explosive growth since the 2010s, and this pattern is expected to continue in the forthcoming years.[17] The competition of Chinese mobile game market is very fierce at the same time. Gacha products with high quality come out and enter the market one by one. It seems that every game can gain lots of attraction and pretty incomes at the very beginning while it is hard for them to survive a rather long lifespan. But Arknights has made it. In every sense, it has become one of the most successful gacha and new IP launched in the recent years which enjoy high reputation and incomes.

Due to its controversial mode of operation, Gacha games have been criticized for being addictive, and are often compared to gambling. But it is difficult to deny that gacha game has already become an important part of game culture and industry worldwide. GameFlow is the classical theory for game evaluation and designation. It is necessary to evaluate the excellent examples such as Arknights with GameFlow. Actually, when distributing missions, Arknights reach the balance between increasing players' skill and challenges set-up. Besides, Arknights is good at telling a story with multimedia for attracting players' concentration and immersion. With the help of GameFlow, it is easy to dig up desirable features of Arknights in attracting the younger generation of players and enhancing the infectiousness of the game.

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