AN UPDATE PARADIGM FOR IMPROVED GAME EVOLUTION

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ABSTRACT

Updates are a fundamental component of game evolution and their impact on communities has become highly relevant in the digital age. There is a need to standardize data collection and discuss update impacts on disruptive behavior in a systematic manner to further the success and benefit of the games medium and industry. This thesis analyzes the current state of three influential games and their current update strategies, and proposes a paradigm using visualizations to characterize data that will enable the industry to systematically dissect the impact of updates on game communities and demonstrate the need for further study.

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INTRODUCTION

Games are an integral component of society for leisure and social stimulation, as they impact our community behavior. “We go in to games today to play together”, since it has become a primary space for socialization and 2.2 billion people play games, 30% of the world's population (Voll). Much of the $134 billion industry capitalizes on the engaging experience of competitive online multiplayer games (Newzoo). The competition is fierce, and from the industry and gamer culture, toxicity spreads through gaming communities to destroy the experiences of players. The anonymity of online play and ubiquity of the negative behavior makes the gaming community as a whole very toxic (*Blackburn and Kwak* 1). In 2017 the Pew Research Center reported that 41% of internet users have experienced harassment (Duggan). 42% of females and 25% of males report harassment as moderate or severe (Fair Play Alliance). 62% of internet users view harassment as a major problem and 79% believe companies need to step in (Duggan). The problem is complex. Toxicity is vague description and to best combat it a central definition is required. The Fair Play Alliance, an industry-wide organization set to create positive gaming communities, has arrived at this definition: toxicity is player behavior that disrupts the experience of other players. It takes away from the core intended experience of the game, hence, disruptive player behavior. For the sake of clarity and consistency, this is the definition used throughout the piece. However, disruption can come in many forms.

Updates are a cornerstone of the industry and any successful game product. They enable the product to evolve and continue to engage the community. Much like how games change the world, updates change the game. Updates can be better, or worse. They can have negative, even crippling, side effects for a community because they change the meta and functionality of the

game. As a result, it is only logical for them to change the player behavior of a community, including the disruptive behavior. However, updates provide a unique and remarkable opportunity to improve and conceptualize communities. They can make communities better and create a bright future for the evolution of a game and society itself. This paper proposes an unprecedented model for systematically examining updates and calls for a games evolution surrounding disruptive behavior.

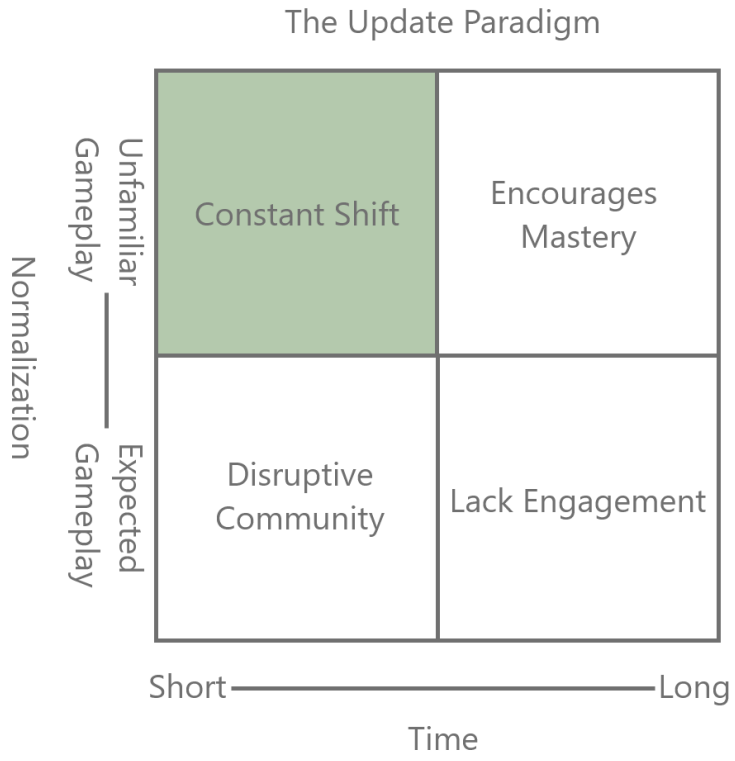

Figure 1. *The Update Paradigm*

This proposed update paradigm represents the presence of the update and how it is received by the community. It makes use of two spectrums (Figure 1). The normalization spectrum represents the expectations of players to be proficient at certain areas of gameplay. It

asks the question, “Has this feature been normalized in the community, and to what extent?” The ability for a player to execute on a normalized feature creates a point of friction with other players. If they fail to perform to the expected standard, another player may see that as disruption and in turn behave disruptively. The time spectrum represents the tempo of a games evolution. How frequently is the product updated? When is new content introduced? How fast are bugs fixed? These can have different effects on the community such as players feeling overwhelmed in short update cycles or board with longer time between updates. These to spectrums combine to create four quadrants.

The normalization spectrum and time spectrum come together to formulate four quadrants representative of the effect of an update. The constant shift quadrant represents when a game is moving very fast and the features and content of the update are not becoming normalized. Players are most likely experiencing a lot of meta shift without being able to grok. In this quadrant, there is no expectation for them to know the content. The encourage mastery quadrant represents long update cycles with content not normalized so it is constantly challenging players and encouraging them to master the system. The disruptive community quadrant represents updates which possibly create extreme “toxicity”. They create or play into expectations for player to know the content, and the game iterates too fast for them to learn it. The last quadrant, lack of engagement, is when the updates minimally evolve the game in an engaging manner and the features become normalized so players are not interested. Hypothetically, the optimal updates exist somewhere in the middle of the four quadrants. It is a balancing act to create the least amount of negative disruption and provide positive evolution for

the product. This is the basis of the paradigm, though other graphics and iterations will be used to help explain varying systems and examples.

I spoke with industry leaders and extensively studied the games medium to arrive at this paradigm. In speaking with experts in the field such as Natasha Miller of Blizzard and Kimberly Voll of Riot Games, I found a clear need for research on updates, but with two caveats. First, no company is able to share the raw data of their games, let alone any data surrounding disruptive behavior. Second, if I wanted to gain access to data or work with a company I would need to show there is a major problem or need for the research for resolutions. This is difficult to do without data. It creates a paradox where data is necessary to show the problem but cannot be obtained without already having a problem to show. I did manage to receive some data from Ubisoft, which showed me there is no established strategy to measure update repercussions on behavior. It is from this and my examination of game news and research which lead to the conclusion that no one has thought systematically about updates or created a paradigm to analyze them. I want to open an entry point for considering the evolution of products and industries of gaming and IT. It is fundamental to the IOT world we live in now and core to the study of communities in the digital age. My proposed paradigm, found in these data visualizations, is the first step to creating a universal method for game evolution analysis and a prioritization of understanding the impacts of updates.

FORTNITE

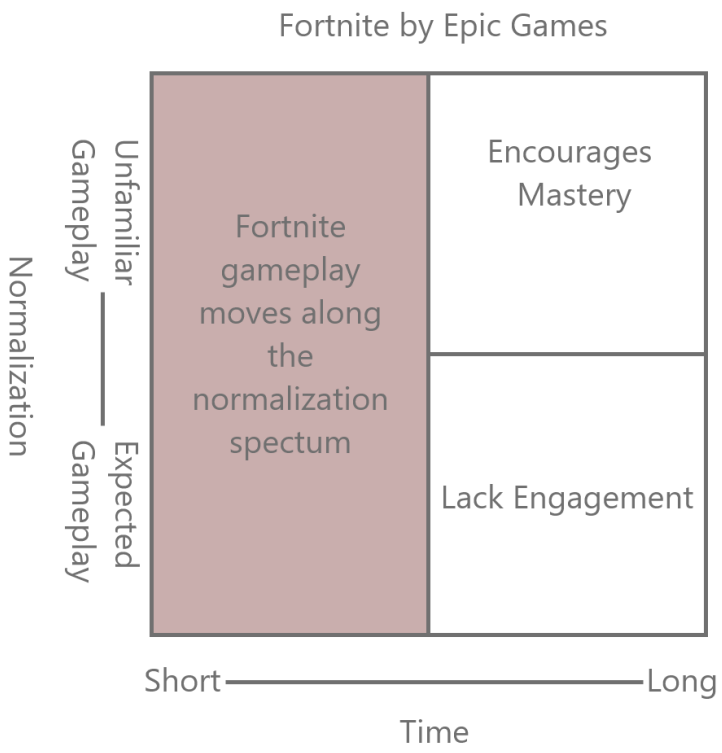

Figure 2. *The Fortnite update pattern*

Fortnite, developed by Epic Games, has been on the battle royale scene and dominates the industry with its unique building mechanic. Battle royale style games see players fight to be the last person standing in an ever-shrinking area. Epic has pursued a very aggressive games as a service (GaaS) model. The GaaS model provides the game a continued life, supported with new content and gameplay changes. Fortnite has seasonal content, of which it is in its 9th season, and major updates every two weeks with more as required. The game continually evolves. However, Epic seems to release frequent updates with content changes and seemingly minimal testing, then observes to see how they play in the live game. As a result, the state of Epic's updates constantly moves on the normalization spectrum (Figure 2). A core mechanic such as building widely goes

unchanged, with professionals recommending specific control setups to help optimize the process. This feature exists very much in the expected gameplay realm of Figure 2. Occasionally though, the community sees an infinity blade situation.

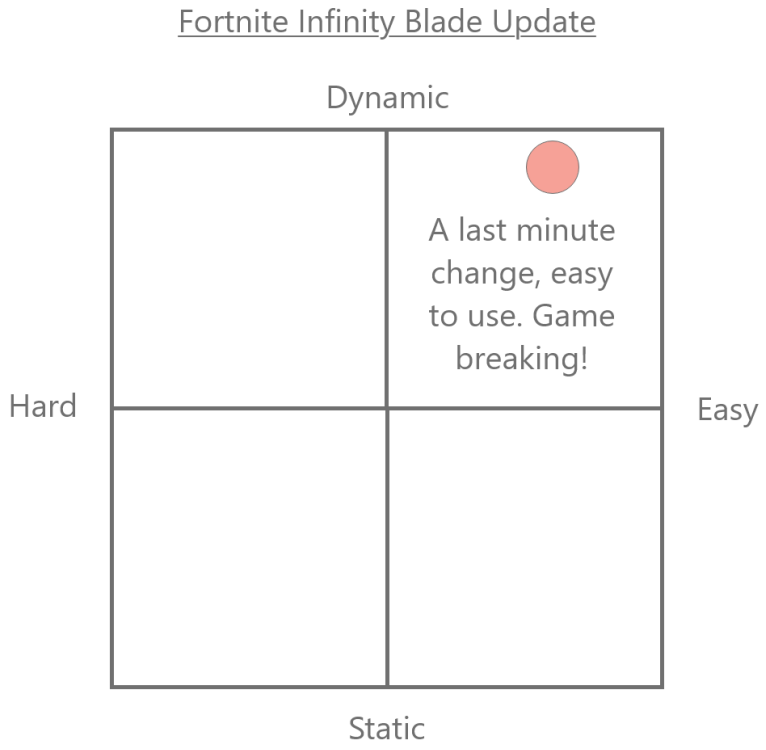

Figure 3. *The infinity blade was easy to use and completely changed the meta making the update game breaking.*

The infinity blade update was a blunder of game design resulting in disruptive behavior in the community. The infinity blade is an in-game item which completely broke the balance of *Fortnite* the day of a major tournament and outraged players (Goslin, “Epic Pulls Overpowered Infinity Blade from Fortnite, Says It 'Messed up' Article”). It was a combination of ease of use mixed with dynamic ability to greatly impact gameplay (Figure 3). The item specifically

countered the building mechanic allowing players to break structures with ease. As a result, Epic Games admitted their mistake and thanked the community for their cooperation. This mishap caused players, even major streamers, to behave in unexpected manners. They became disruptive because of the update, and they "raged" (Fortnite 4Head). This is an example where the update caused the game to shift to very unexpected gameplay, and since it clearly broke the balance, it created mass frustration.

More recently, *Fortnite*'s Season 8 content angered players forcing them to lash out. One player took it upon themselves to punish Epic Games and hacked the Fortnite Twitter account (Turunen). In the article on Fortnite Intel, it states the player expressed their frustration with the changes to the competitive scene of Fortnite. This was most likely referencing the removal of the benefit from screen stretching. Screen stretching is a tactic used to increase the size of players on screen by changing the display resolution so they are easier to hit. With professionals relying on this feature, their expected gameplay, it is logical the removal would anger them in the middle of the tournament line up. The repercussions of the hack were felt outside of the game, but one can only wonder what behavior these changes inspired in game.

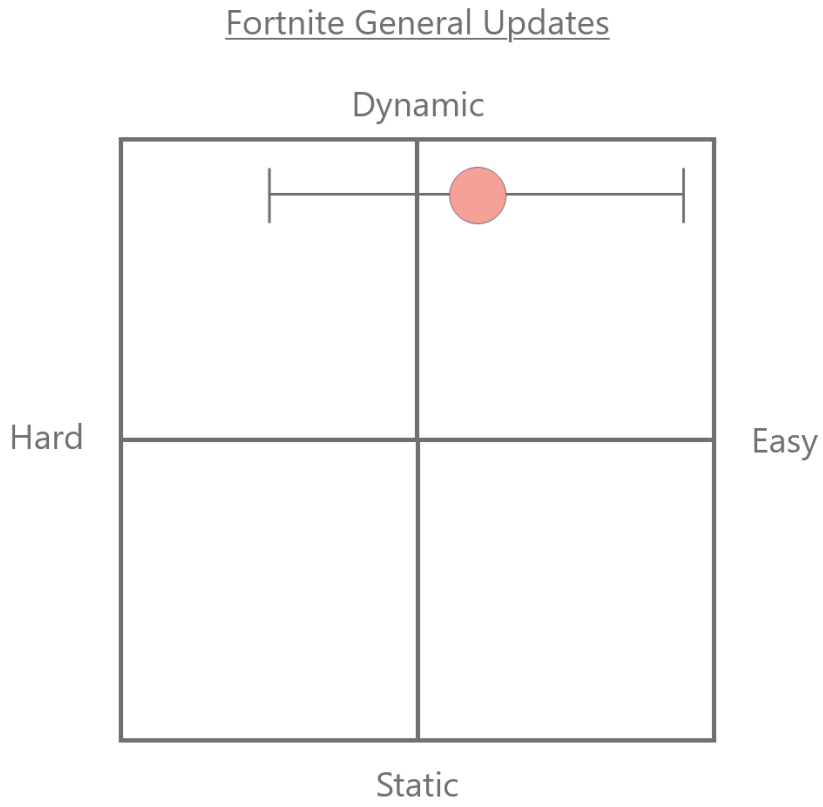

Figure 4. *The general update strategy of Fortnite varies in difficulty of use but generally creates extensive meta shift and evolution for the game which can spark disruptive behavior if done poorly*

The recent reintroduction of the drum gun puts Epic Games' intentions into question. The drum gun, a weapon which counters the core mechanic of building and is reported by the community to be overpowered and "sucks" (Davenport). This update has already angered the community, as shown in the article on PC Gamer by James Davenport. It seems "Epic is just playing with our expectations a few days before the launch of Season 9" which reinforces this argument of *Fortnite* moving along the normalization spectrum (Davenport). The real worry with

the drum gun is the instant "metafication" (the act of something becoming meta) of the item in competitive play as "players rolling with a couple drum guns in their inventory, just for the non-stop damage output" (Davenport). Thankfully, the drum gun will not be in competitive play for the weekend but it still has the potential to redirect the course of *Fortnite*'s $40 million tournament series in a very negative manner upon introduction at a later date (Davenport). It is questionable if Epic has learned from the infinity blade incident. The drum gun instance unfortunately fits the model of previous updates which also happens to merge well with the general pattern for *Fortnite*'s updates (Figure 3 & Figure 4). The weapon specifically counters building, similar to the infinity blade, which uproots the whole Fortnite experience and strategy with a mindless weedwhacker. It's really a simple question: if it seems to disrupt the community, why fuel the fire? Or is there a more underlying malevolent intent behind this? Maybe there is benefit to upsetting players to increase retention, or this is just a poorly executed strategy to keep players on their toes. This is a strong instance where more research of updates is warranted so developers can better understand the implications of their design decisions to ultimately build positive communities. Overall, Epic swings back and forth on a large update pendulum and further research could improve the outcome.

Epic has a crunch problem which is reflected in the shortness of their updates. Their aggressive update schedule is what places them to the left-most of the time spectrum in my update paradigm. These fast updates have put immense pressure on the employees of Epic Games. The Polygon article by Colin Campbell paints this picture:

> The popularity of *Fortnite* has been transformative for Epic Games. But the game's explosive growth led to months of intense crunch for Epic employees and contractors, some of whom say they felt

> extreme pressure to work grueling hours to maintain *Fortnite*'s success and profitability, resulting in a toxic, stressful environment at the company.

The constant rush for updates creates a toxic work culture through the need for content; "Its regular updates, including new weapons and map alterations, are followed avidly by millions of players and fans" (Campbell). The larger issue is that "crunch can be a constant problem" due to the live service model. This toxicity present in the company fuels the disruptive behavior in the community. It is a problem of supply and demand. The ongoing need for new content by the community, the demand, is fed by the companies crunch culture, the supply. The rush to feed the demand results in update errors such as bugs, constantly shifting meta from poor design decisions, and a plethora of other flaws which creates areas of friction for disruptive behavior in the community. In the end the two cultures, games industry and gamer, are mirroring each other. This creates a never-ending yin and yang of disruptive behavior, which will surely bring about the demise of the product if not the industry as a whole. From my model we are able to analyze this issue and systematically compare to the industry. Fundamentally, it shows that making a better update reduces disruption in the game community. The reduced disruption contributes to a better game with greater retention and growth, which is highly beneficial for the company. Not to mention the fact that it should reduce the stress put on the company and its employees. The model offers a solution to this by demonstrating that smarter and more effective updates designed to achieve the optimal solution for a game will result in less crunch for developers and a more positive work culture. It moves towards a state of balance, rather than an out of control development. Simply put, better updates yield a better industry.

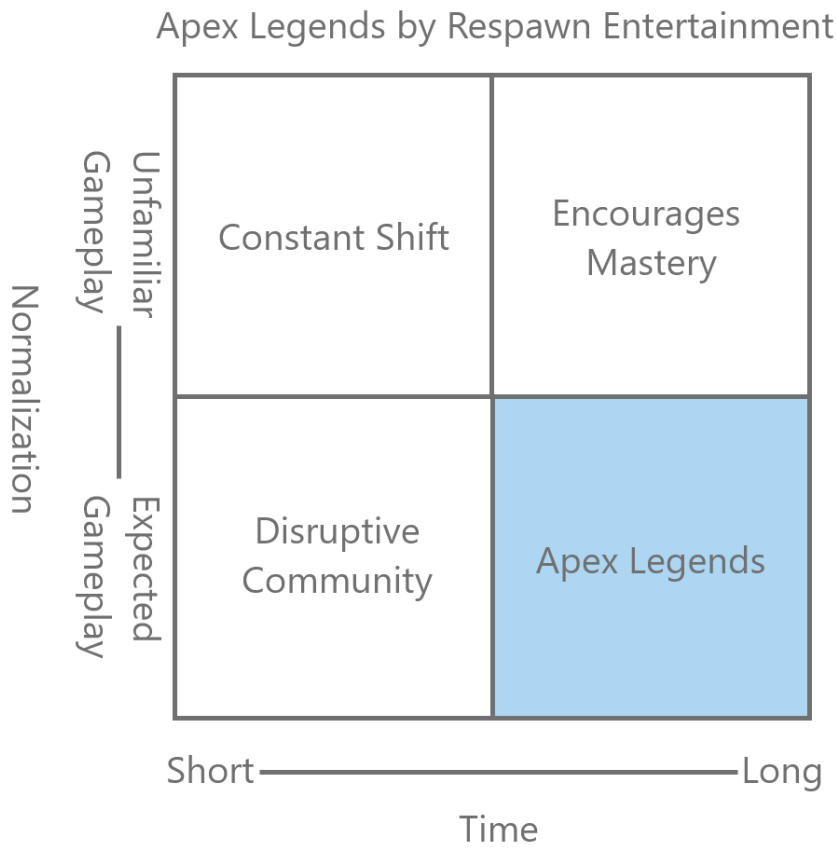

Figure 5. *The update strategy of Apex Legends is failing to keep players engaged.*

Apex Legends, developed by Respawn Entertainment and published by Electronic Arts, is a more recent battle royal title and has skyrocketed to popularity with its clever team composition mechanics. Respawn Entertainment has taken a much more conservative strategy to live service with *Apex Legends*. In the official *Apex Legends* developer news, they explained their intent to make infrequent and well-tested changes (Electronic Arts). Their reasoning is to avoid disrupting the community with poor or unnecessary changes. It is clear that they are addressing some of the flaws seen with Epic Games' management of Fortnite. As a result, they

sit in a different area from *Fortnite*. *Apex Legends* moves to the right on the time scale due to the studios' explicit intent to evolve slower with higher quality:

> Our goal is to make less frequent, better tested, higher impact changes, so it minimizes the effects on your time spent mastering a particular mechanic, weapon, character, etc. You shouldn't have to read our patch notes every few days just to keep up with how characters and weapons now work.

The first character to release as part of Season 1 was Octane. The developers cleverly introduced his ultimate ability, a jump pad.

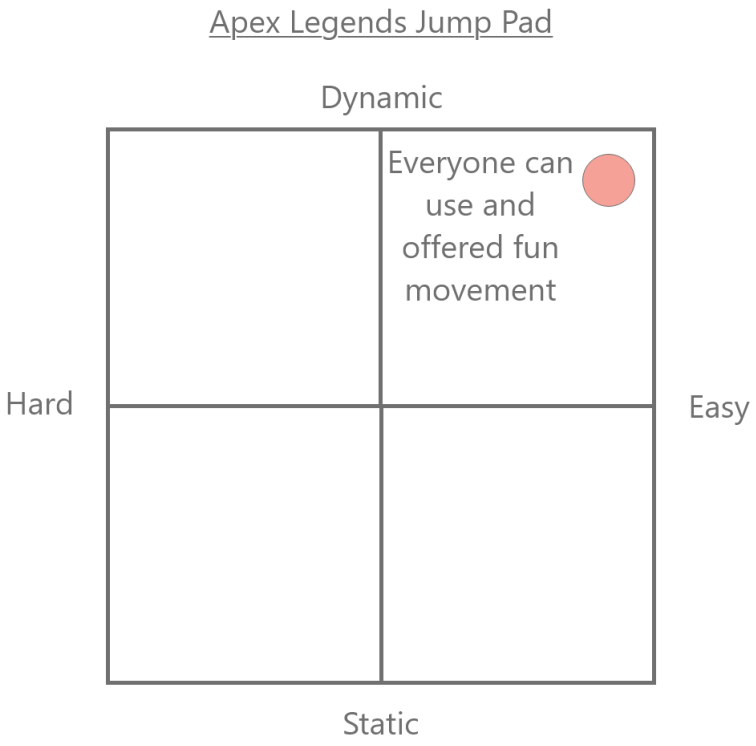

Figure 6. *The jump pad was randomly found and easy to use with compelling movement benefit.*

A few days before the character was released, jump pads were littered around the map for players to pick up and deploy a single time. This provided a great deal of benefits in addition to

hyping up the launch of Octane. It introduced players to his functionality, making them want to buy him with in game currency. It also created fun dynamic situations for a few days. No disruption was created, it was a light touch and was enjoyed by everyone as they weaned the player base into the new expected gameplay. As illustrated in Figure 6, this model aids in understanding how this update was integrated into the game and the relationship with the positive outcomes experienced. Unfortunately, the jump pad introduction seems to be a rare occurrence.

Apex Legends has not received a lot of content changes, which demonstrates some of its issues. There have not been large meta shifts, and strategies have generally stayed the same. That seems to be the intent of EA and Respawn. They are pushing for player mastery in the above state, which makes sense for a competitive game. However, they seem to be failing in trying to hold onto the engagement of the larger gamer space which is why *Apex Legends* is on the decline in public eye. This causing concern to grow throughout the community. For example, Polygon wrote an article claiming the game is updating too slowly (Goslin, "Apex Legends Has Lost Its Huge Momentum"). This has resulted in a decline in viewership on streaming platforms and the overall presence of the game to diminish. The irony here is Polygon is the same website owned by Vox Media, which published the in-depth research into the toxic culture at Epic Games (referenced above). What Golsin is saying in the article is correct. Apex has been suffering due to lack of content and iterations, however, it is still trying to protect its employees. A Forbes article by Dave Thier points out how "*Fortnite* set the bar", but Respawn is very conscious of their teams' health and their goal of building something sustainable. But, he mentioned that some employees have expressed being in a constant state of crunch just like Epic Games. This is

worrisome since they have taken a much slower pace, which would seemingly require less effort and be more sustainable. This begs the question, what is the optimal update cycle? *Apex Legends* is still young with a large outline for its future updates. And with Season 2 around the corner, it will be fascinating to see if they continue on their own path or follow in the footsteps of *Fortnite*. My proposed model offers a strategy to find the optimal update cycle for Respawn and measure its effectiveness and impact on the player base.

There is a need for a happy medium between the live service strategy of *Fortnite* and *Apex Legends*. Both games are on the extreme ends of the spectrum, and both strategies are sacrificing a lot at the expense of employees and players (Figure 2 and Figure 5). There are a plethora of factors to consider, but it comes down to a balance between the supply and demand, and the employees and players. This warrants further research to understand where this happy medium exists for games of the battle royal genre with a live service model, and my paradigm offers a basis for that research.

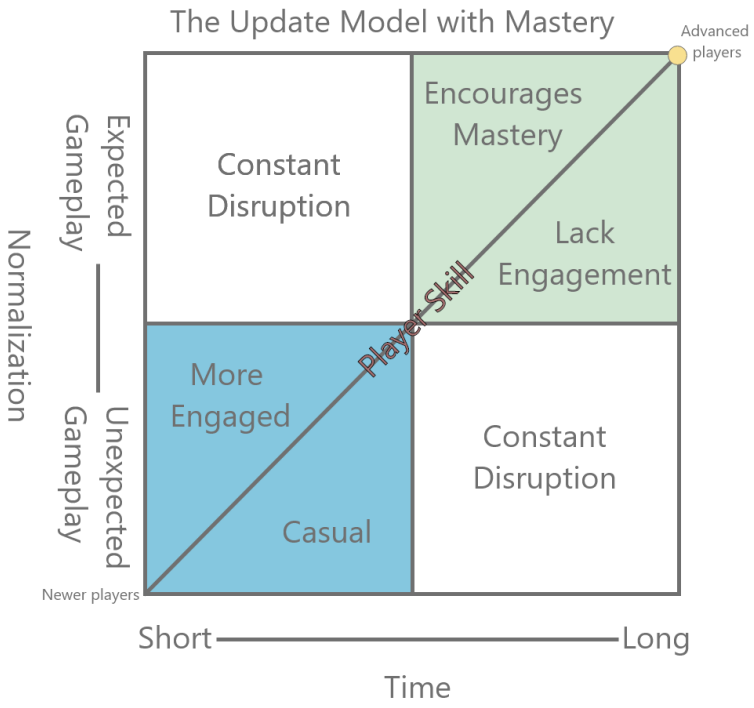

Figure 7. *This graphic introduces the player skill variable.*

The Update Model with Mastery changes the paradigm by accounting for player skill and experience as seen in Figure 7. The model in Figure 7 builds on the model in Figure 1. The normalization spectrum has been flipped so expected gameplay is at the top with unexpected gameplay at the base, which is also where new players exist. The diagonal represents the range of newer players to the advanced players. Players who are advanced are determined based off of skill and time investment into the game. Gaming has generally shown that these two factors are correlated. Advanced players, represented by the yellow dot, are the top .01% of a game and can be thought of as individuals belonging to a few categories: professional players, content creator

(streamers, youtubers, personalities, etc.), and individuals who are ranked highly on the leaderboard.

RAINBOW SIX SIEGE

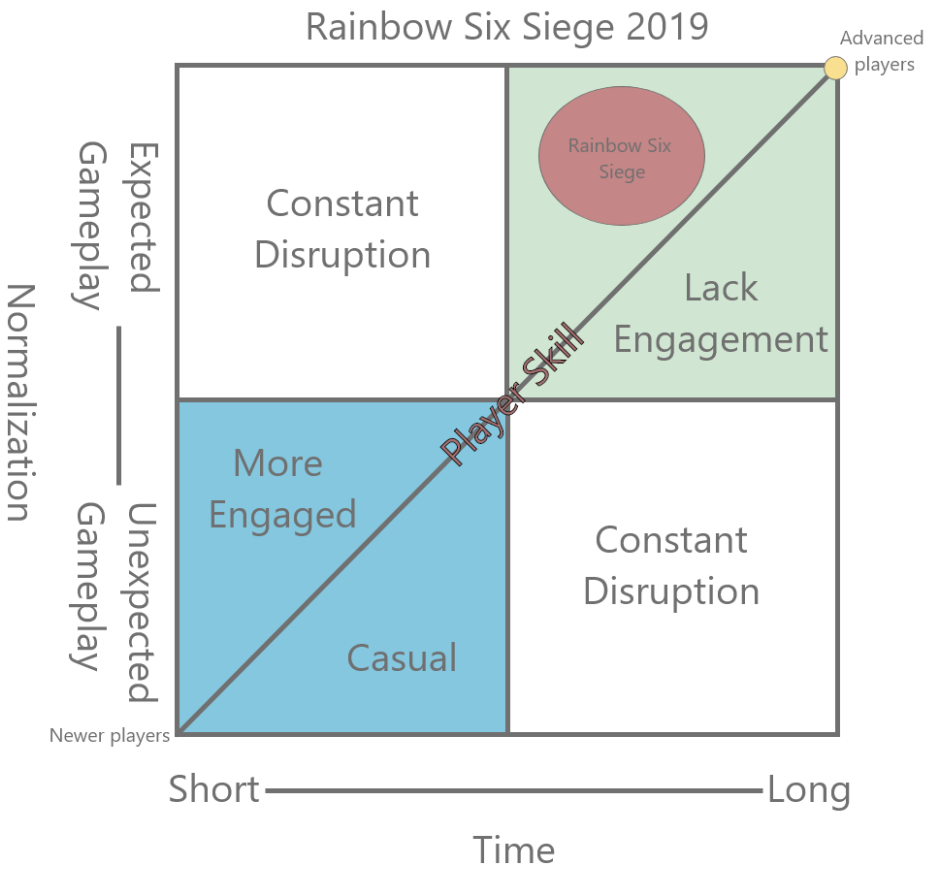

Figure 8. *Rainbow Six Siege's competitive and complicated gameplay caters to a more advanced player audience*

This new Update Model with Mastery is used to analyze *Rainbow Six Siege.* This Ubisoft creation is a competitive team-based shooter game with destructible environments that encourages teamwork, competitive play, and mastery. Teams of five players are pitted against

one another in attacker and defender sides. Each side has unique characters with special abilities and mechanics. All players have access to the base abilities of movement, shooting and aiming, but the differing abilities and environmental destruction create the immense variation and depth. This paradigm illustrates a system for looking at this relationship between engagement, mastery, and disruption, which hasn't been possible to visualize before from published research.

In its fourth year of content, the current state of Rainbow Six Siege is catering to competitive players, streamers, and professionals. Ubisoft is developing content to engage competitive players and retain their advanced demographic. At its heart it is a complicated and competitive game, which makes it difficult for newer players and this update strategy does not help. A strong example of it is how the game designer infographics show how the game is balanced around the platinum and diamond ranks. My rank is usually silver or gold, which means I am not influencing their balancing decision. They are balancing around the audience they cater to, which is advanced players. As a result, they are positioned along the player skill spectrum in the intermediate to advanced area (Figure 8). It is from my model which *Rainbow Six Siege*'s updates can be analyzed and improved.

Rainbow Six Siege has found a year-long update cycle with a seasonal pattern that provides consistent content and effectively incorporates the tournament scene. Major updates arrive in seasonal markers, which in comparison to *Fortnite* is slow, but with games of the genre is rather rapid. This allows plenty of time for players to gain mastery of the current system, but is frequent enough to avoid any engagement loss. It's in line with their audience, not to mention the fact that it works well with the professional component so more "normal" players can practice for shots at the higher levels. The highest-level players then play the tournament scene for

substantial prize money, a status obtainable to any player. To keep the competitive scene intact, Ubisoft reworks characters. One especially pertinent example of this is the Lion Rework (Ubisoft, “Y4S1.3 Designer's Notes.”), which involved a character who was broken and banned from the professional league for the ability to see characters through walls. The rework toned down this ability while still keeping a similar functionality. It removed the outline and replaced it with a ping icon and changed the timing mechanism. Lion still combos with all characters but is best played by a player with advanced map knowledge and enemy character behavior (Figure 9). This demonstrates how the game is balanced around advanced players. The Figure 9 is another model to analyze specific updates and strategies through. It crosses usability with dynamic or static interactions to see how prevalent or disruptive the evolution may be to the gameplay. This graphic is an excellent tool for reviewing major design changes such as a character rework like Lions or the judging the effectiveness of the character pool. It is a useful tool of communication between developers and players in addition to other strategies to help strengthen the relationship of trust between both communities.

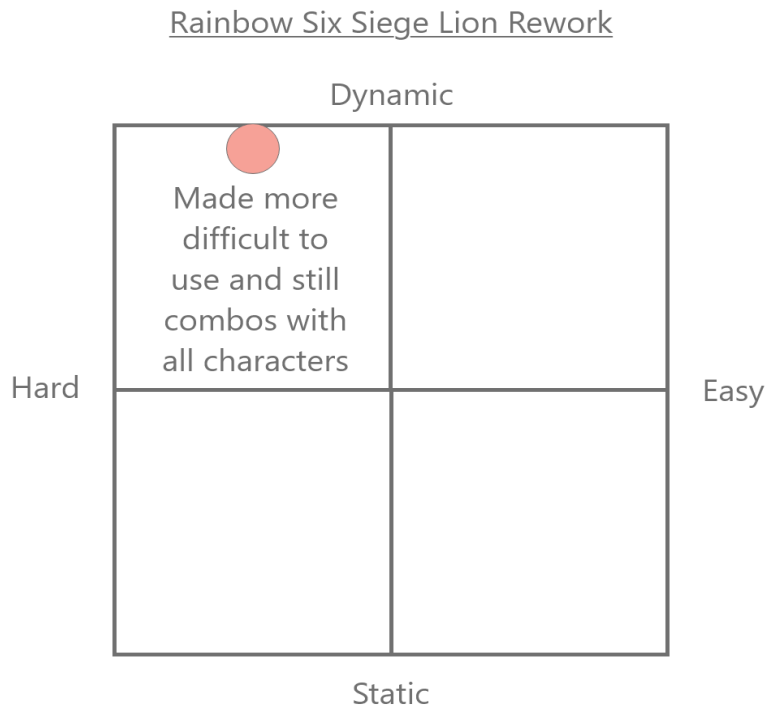

Figure 9. *It is clear the Lion rework was targeted at the competitive scene since his ability is best utilized by a player with advanced map and character knowledge.*

Ubisoft uses effective communication to include their players in the design process, with infographics showing the pick and win rate of characters along with detailed designer notes in their blog. Additionally, a new system, the Bug Hunter Program, enlists the community in to help solve bugs through light competitive incentive that encourages players to be the first to find a bug and rewards them for proving the issue to Ubisoft so they can fix it (Ubisoft, "Bug Hunter Program."). This is another excellent way to incorporate the community. Ubisoft takes advantage of community involvement and effective communication to help reduce disruptive behavior in their games. Nonetheless, with such a complicated game and competitive nature, the expectations are high for players.

The gameplay expectations are high due to competitive social play. *Rainbow Six Siege* is incorporate social gameplay into its core loop, meaning communication is key to the success of the team. The competition mixed with the fundamental need for communication creates friction, often resulting in disruptive behavior. Additionally, the expectations from players' peers are difficult to meet, meaning there is always an expectation to be better. This creates a community which fundamentally pushes new players down rather than pulling them up. The community does not foster new players, because it's not only difficult to enter from a technical player perspective but also socially due to the reprehensible behavior of a few individuals. Players are best off having a lot of time and natural skill to play *Rainbow Six Siege*. The goal should be to use updates to reverse this.

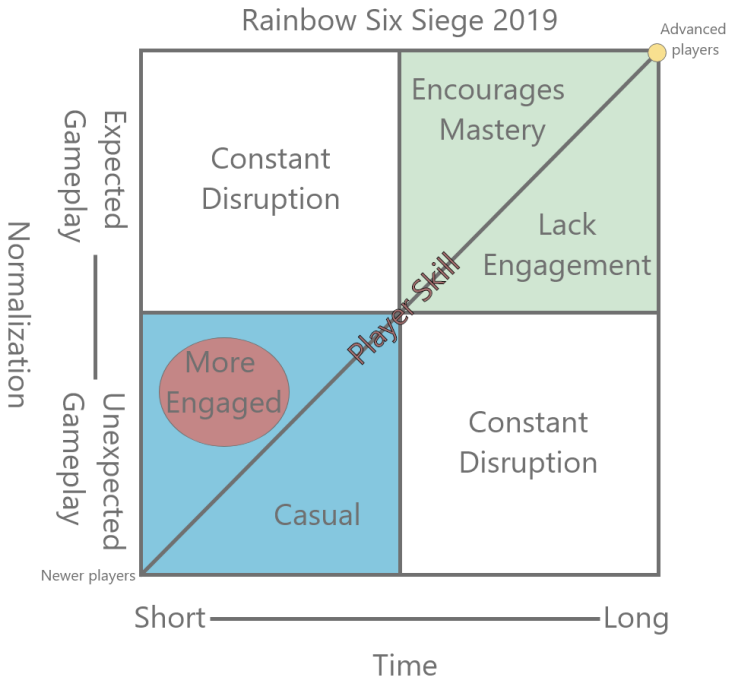

Figure 10. *Shorter and unexpected updates that cater to newer players will help with onboarding and retention at early stages in the player experience*

Updates can change the culture of communities. An update strategy that is short and unexpected, perhaps even sheltering newer players from those more advanced, is invaluable (Figure 10). It could engage newer players and foster the community to create a culture that uplifts those with less experience. This update or update strategy would use smaller amounts of unexpected content with a short turnover time to engage early players. This has been done to some capacity, like with the Rainbow is Magic event or the Mad House event. However, these clearly require a decent amount of work to help to engage newer and older players with casual content. The general play experience with these events was very positive, demonstrating that my model reflects correct decisions and can be used to influence future update strategies. Most important it demonstrates the need for further research to explore the paradigm in detail with data from large scale games. Another strong example of a small fix was the switching of the defusing animation. Previously a defender would smash the diffuser box to deactivate it. This allowed for some mild exploits often referred to as “long arming”, where a player would take advantage of the animation to hide out of view and hit the diffuser box. It created for confusing and disruptive behavior. There was no reason to have something so simple and fundamental to the gameplay experience create that level of frustration. The switch to a more technological approach was a mobile-like device the player could use to jam or short-circuit the diffuser. It removed the animation problem and incorporated better sounds to create a straight forward, cohesive feature (Figure 11). In the end, it helped to reduce possible friction between players, making it a simple and effective change which reflects the thoroughness of my model.

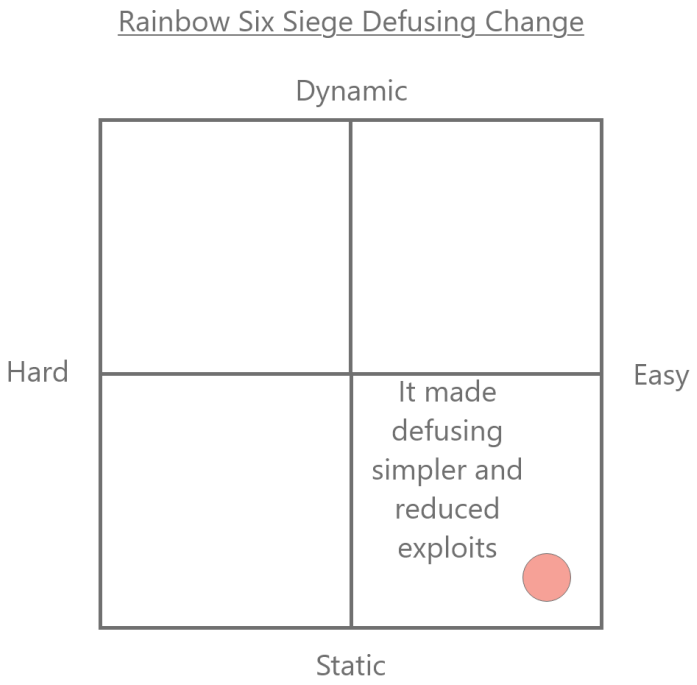

Figure 11. *Since this change was a fundamental part of gameplay and simplistic to use with a single button press, the update lands itself in the lower right-hand corner.*

The Ubisoft developers have created something great, but like the industry itself, have a long way to go to further understand disruptive behavior in game evolutions. I had the pleasure to speak with and examine data provided by Ubisoft team members. The data given to me struggles to paint a picture of the disruptive state of the game and does not provide insight into how disruption has changed over *Rainbow Six Siege*'s life time. I was not able to glean any information around the impact of updates on disruptive behavior in the community. However, this shows the data is there and collectible. This clearly illustrates a need for standardization of data collection allowing game companies to engage in a constructive discourse and compare results. Research is warranted to establishing a baseline to assess the toxicity of a community. And, the industry must begin to look at the effects of updates on the toxicity and extrapolate

from that the different components of updates and their relative impacts. This will allow the analysis of a disruptive behavior evolution in games while enabling developers to make meaningful and informed decisions.

CONCLUSION

Game design is fundamental to creating and improving communities. My model makes this achievable by clearly outlining how flawed and good design of updates impacts player behavior. Disruptive behavior is not something that can be banned out, but it has a lasting detrimental impact on those who experience it. Players are motivated by the basic humanistic instinct to triumph over another human being, which is at the root of competition and creates toxicity. It is core to certain game structures, and the toxic response to updates show this. Better updating results in game redesign, along with social and neurobiological engineering to help control and redistribute the disruption. Because games can evolve in unexpected directions by chance, anything to help gain design clarity around game evolution is necessary. My paradigm provides the basis for research and analysis to achieve better update systems. Furthermore, games inherently provide a safe space for players. They are also an excellent arena for experiments and examinations of humanity on numerous levels, both instinctual and social, unconscious and conscious. They are a powerful tool to educate the masses and derive real world solutions, but to achieve their full potential, they need to be studied in a systematic manner. This allows them to be improved upon and understood in a way that hasn't been done before, and would unlock the neurological potential of gameplay as well.

All games change brains, so it's a necessity to be able to control the brain change that inevitably happens. Though paradigm shifts are almost always met with resistance, there is a sort of warrior mentality in the gaming culture (made up of both the industry members and the players) when it comes to making adaptations or accomplishing goals that seem impossible. If this understanding and this proposed model are embraced, we will be able to work with industry leaders and encourage each other to improve the existing update systems. This will result in healthier games with limited toxicity and disruption, less crunch for employees, and a better community overall. My update paradigm for improved game evolution is the way in which the game industry can launch itself out of its own deeply ingrained innovation rut.

Works Cited

Blackburn, Jeremy, and Haewoon Kwak. "Stfu noob!: predicting crowdsourced decisions on toxic behavior in online games." *Proceedings of the 23rd international conference on World wide web*. ACM, 2014.

Campbell, Colin. “How Fortnite's Success Led to Months of Intense Crunch at Epic Games.” *Polygon*, Vox Media, 23 Apr. 2019, www.polygon.com/2019/4/23/18507750/fortnite-work-crunch-epic-games.

Davenport, James. “The Return of Fortnite's God Awful Drum Gun Has to Be a Prank.” *PC Gamer*, Future US Inc, 6 May 2019, www.pcgamer.com/fortnite-drum-gun/.

Duggan, Maeve. “Online Harassment 2017.” *Pew Research Center: Internet, Science & Tech*, Pew Research Center: Internet, Science & Tech, 3 Jan. 2018, www.pewinternet.org/2017/07/11/online-harassment-2017/.

Electronic Arts. “Apex Legends – March 6 Live Balance Update.” *Electronic Arts*, Electronic Arts Inc., 12 Apr. 2019, www.ea.com/games/apex-legends/news/live-balance-update-march-2019.

Fair Play Alliance. “Player Behavior Research Microtalks (Presented by Fair Play Alliance).” *GDC Vault*, UBM Tech, 2019, www.gdcvault.com/play/1025803/Player-Behavior-Research-Microtalks-(Presented.

“FAQ.” *Fair Play Alliance*, Fair Play Alliance, 2018, fairplayalliance.org/faq/.

Fortnite 4Head. “Tfue & PRO Players RAGED after Epic Added Infinity Blade 10 HOURS before $1M Tourney (Winter Royale).” *YouTube*, YouTube, 11 Dec. 2018, www.youtube.com/watch?v=b8d9ZhQ6eyY.

Goslin, Austen. “Epic Pulls Overpowered Infinity Blade from Fortnite, Says It 'Messed up'.” *Polygon*, Vox Media, 14 Dec. 2018, www.polygon.com/fortnite/2018/12/14/18141134/fortnite-infinity-blade-removed.

Goslin, Austen. “Apex Legends Has Lost Its Huge Momentum.” *Polygon*, Vox Media, 12 Apr. 2019, www.polygon.com/2019/4/12/18300950/apex-legends-content-decline-update-patch-fortnite.

“Newzoo's Key Numbers | Games, Esports, Mobile.” *Newzoo*, Newzoo, 2018, newzoo.com/key-numbers/.

Thier, Dave. “Respawn Has A Very Good Reason For Why 'Apex Legends' Updates Are Coming Slowly.” *Forbes*, Forbes Media LLC, 26 Apr. 2019, www.forbes.com/sites/davidthier/2019/04/26/respawn-has-a-very-good-reason-for-why-apex-legends-updates-are-coming-slowly/#1a0d5f7d7d9e.

Turunen, Tommi. “Official Fortnite Twitter Account Has Been Hacked.” *Fortnite INTEL*, FortniteINTEL, 3 Apr. 2019, fortniteintel.com/official-fortnite-twitter-account-has-been-hacked/15266/.

Ubisoft. “Y4S1.3 Designer's Notes.” *Y4S1.3 Designer's Notes | Rainbow Six® Siege Game News & Updates | Ubisoft® (US)*, Ubisoft, 11 Apr. 2019, rainbow6.ubisoft.com/siege/en-us/news/152-347920-16/y4s13-designers-notes.

Ubisoft. “Bug Hunter Program.” *Bug Hunter Program | Rainbow Six® Siege Game News & Updates | Ubisoft® (US)*, Ubisoft, 25 Apr. 2019, rainbow6.ubisoft.com/siege/en-us/news/152-348283-16/bug-hunter-program.

Voll, Kimberly. “Honorable Intentions: Player Behavior Today at Riot Games.” *GDC Vault*, UBM Tech, 2018, www.gdcvault.com/play/1025488/Honorable-Intentions-Player-Behavior-Today.

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