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An abstract, draft, or completed research paper describing your privacy or data security research:

Monetization strategies employed across and within free to play applications – an evolving ethical landscape.

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Traditional video games operate on a single pay model, you buy the game and you own it. However there is a second model, the “freemium model” which is becoming increasingly popular. The freemium model (Free-to-play/in-app purchase games (F2P)) offers free access to a game and the game earns a profit by selling upgrades, shortcuts and recharges within the game. Notably freemium games can generate much larger profits if they successfully induce users to repeatedly spend within the game. While every game needs a revenue stream to remain viable, the open-ended nature of F2P economics relies on marketing strategies and user profiling strategies that can range from reasonable to exploitative. In some well publicized cases, app manufacturers and platforms targeted children by hiding expensive items within children’s games and allowing credit card authorization to persist after an initial purchase was made and after the parents handed the game over their kids (Greenbaum 2011). This leads to big profits from unauthorized purchases. The issue got so bad that it led to a pair of FTC rulings were leveled against Apple (\$32.5M) and Google (\$19M) for deceptive business practices (Bartz 2015).

In our research we aimed to find out what else F2P app companies were doing to increase their profits. By conducting a broad search of literature, including industry blogs, technical papers company slide decks and advertisements from video game monetization services, we were able to identify and describe the economics of, and methods used, in a practice called “Whale hunting”. Similar to methods used by casinos, F2P app monetization companies offer services aimed at identification tracking and manipulation of the biggest spending customers known as “Whales”. Companies such as Soomla and EEDAR track user data, identify whales and offer tools that can be used to target high spending consumers target.

In addition to tactics used to monetize whales across apps, we also researched methods used within apps to induce players to spend on in-game purchases. One tactic involves changing the nature of the game as a player gets deeper into the game. A skill-based game can be changed to a pay-based game by sharply increasing the difficulty of the game then offering the option to pay for aids to game play (such as jet packs) if the transition is made once the player has invested a large amount of time and expectation into the game they may think that they are winning based on skill (Shokrizade, 2013). Another trick is the use of paywalls can be very effectively applied if a user has gone deeply into a game and is at a point when they can lose all of their investment if they do not move to the next stage. This could be as blatant as demanding money for an expansion pack at a set point in the game or might be much more subtle like offering the opportunity to purchase a jetpack to a starving

shark who is chasing increasingly fast fish. The practice of increasing the level of difficulty of a game until a player begins to lose, then be offering a purchase that will relieve that stress is called “fun pain” (Shokrizade, 2013). However this is not always fun, consider the mental state of another whale who invested \$600 in virtual walls to fortify a virtual city which was promptly leveled. All of these techniques become increasingly powerful when combined with sophisticated machine learning models that can dynamically analyze a player’s commitment level, spending limits and tolerance for risk.

References

Bartz, D (2014) “Google to refund \$19 million in kids' inapp purchase case U.S.”, Web blog post, Reuters, Published: Fri Sep 5, 2014 1:20am IST, Retrieved March 10, 2015, Ed. M. Zargham

Greenbaum,D (2011) “In App Purchases and The Smurfberry Affair”, Web blog post, Gigamom, Published: Feb. 21, 2011 12:00 PM PDT, Retrieved: April 19, 20

Shokrizade (2013) “The Top F2P Monetization Tricks”, Gamasutra, 06/26/13 08:16:00 am, Accessed: April 14, 2015

- **The findings we plan to present**

We find that monetization companies have developed methods to identify high spending ”whale” players and target them in ways to maximize the money they spend within their client’s video games. Within games, companies are reported to change game play in in order to maximize spending by whales. One technique is altering the timing of paywall erection based on modeling of player investment based on time spent in the and player profile another is to alter the difficulty of a game until the player spends on an in game upgrade. We will present evidence of these practices from company advertisements, industry presentations, gaming blogs and have verified these practices with an industry insider.

- **Our methodology**

We derived our data from a variety of sources starting with promotional materials from gaming monetization companies an interview with a gaming industry insider gaming industry blogs and scholarly papers outlining whale hunting practices used in the gambling industry. Technical papers provided to customers by video game analytics companies provided an overview of industry economics, practices and strategies while gaming blogs provided both insight into tactics used within games to manipulate player behavior as well as a discussion of the effects of whale hunting practices on gamers.

- **How our research differs from prior research in the area.**

Our research represents an academic effort to describe and analyze how companies perform profiling and categorization of whales in the context of mobile games and in the mobile gaming ecosystem. It has no commercial sponsors or influence.

How our work satisfies the selection criteria:

- This is our own research that we designed and conducted.
- We receive no corporate funding for this report.
- This research presents objective facts about the industry obtained from interviews, web sources [etc].
- There is no promotional or commercial aspect to our research or our intended presentation.
- Our research does not present any security vulnerabilities.
- Our research is the product of work done as students in the Berkeley Master of Data Science program.