Big Data Gaming:

The Practice and Use of Big Data at Electronic Arts

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Big Data has become the tool of companies around the world. Those who resist will most likely conform or fail. The game industry recognizes the value of Big Data and companies like Electronic Arts are on the forefront of Big Data innovation. Founded in 1982, “Electronic Arts Inc. is a leading global interactive entertainment software company.” Based in Redwood City, California, EA is a publicly traded publisher that “delivers games, content and online services for Internet-connected consoles, personal computers, mobile phones and tablets” (Electronic Arts Inc.). It is acclaimed for its “high-quality blockbuster brands” that include, but are not limited to, *The Sims*, *EA SPORTS FIFA*, *Battlefield*, *Dragon Age* and *Plants vs. Zombies*. To maintain a successful brand and good standing, EA utilizes Big Data across the company. This summary covers Electronic Arts’ Big Data practice with a focus on marketing and game development.

EA’s data practice is comprehensive with the goal to always create a better product and increase financial success. Data is collected on all user interactions in game, constantly begging the question what is the user doing? This data is used to cater to the user and improve their experience. Data is captured upon game start when an anonymous ID is given to each user’s device. The ID is then tracked through all game events such as game start, levels played, and actions taken. Anything a user does in an EA game is an event and all events are recorded (Sides). Additionally, this ID can be tied to a Facebook or Origin account, Origin being the EA game client on PC, if a user logs in. When a user logs into Facebook, EA has a programmed set of permissions that they receive, such as profile name, picture and friends list. There are many more permissions that will provide different types of information and some are more difficult to obtain, such as allowing a game to share on Facebook (Sides). EA will receive information

applying to an individual from companies like Facebook, but cannot tie any of this information to a user since it is all done anonymously. Furthermore, any user can turn off the tracking of their in game information, however, most do not! All users are notified of EA's data collection policy in their Terms of Service. In order for a user to play the game they must accept the Terms of Service, but they can still turn off the tracking.

Big Data is invaluable in helping an EA marketing team achieve their goal of installs. The job of a marketing team is to get a user to start the game. Big Data makes this process more efficient and accurate. For marketing purposes, EA primarily collects outside data on social networking interactions. They are concerned about the reach and if that turns into engagements and installs. It is difficult, however, to correlate reach to installs. For example, a celebrity tweets a game and the reach is 15 million (the celebrity's followers); it is difficult to know what percentage of that reach turns into installs from that specific tweet (Sides). It is not as accurate of a method as a targeted ad campaign that gives the team a handle on their Cost Per Install (CPI) because it uses a traceable URL. Marketing teams use Big Data to help keep the CPI as low as possible. Obviously the less a company spends on advertising the more efficient it is and data is "ensuring that the money that is being spent, is being spent properly" (Sides). Part of lowering CPI and increasing efficiency is making sure the right people see the advertisement.

Big Data improves ad targeting accuracy. Targeted advertising has become a company necessity and it is prolific in the tech and game industry. Marketers want to know where the installs come from, the origin or channel. Properly directed advertising will target the correct channels. For example, an advertising campaign with a URL produces very accurate install and

origin data. This can be used to calculate CPI. Still, user acquisition does not always occur from targeted ads or celebrity publicity.

On mobile, the app store marketplace is flooded and user acquisition is difficult. App store placement is key to getting continual installs. *App Annie* is one trusted resource used by EA that provides useful analytics and data, such as game placement, for most mobile apps and games (Sides). This information is helpful when trying to sort through the flooded marketplace and get top placement. Nonetheless, EA has a team that works with Apple, Google and other app stores to assure their games receive special positioning. If a game receives, for example, banner placement on an app store it is guaranteed continual installs. With Google and the Google Play store, engagement will dictate placement, underscoring the importance for the development teams to keep users in the game, thus clinching the position at the top of the search hierarchy (Sides). Apple recently introduced Search Ads which are advertisements that appear when certain other apps are searched. This is one way that big titles are able to buy up and saturate advertising space. In the end, it becomes a bidding war and the question is how to get the lowest CPI and maximize efficiency in user acquisition. Once a user starts the game the marketing team is done. It is now the job of the development team to keep the user in game and provide them with a positive experience, but first they have to acquire the data.

EA collects large amounts of in game data to condense into quantitative information for development teams. At EA Mobile any user interaction is collected. Each user interaction is an event and with each event a huge amount of data is released. The development team determines the relevance and value of each type of data as part of an in game event. The valuable data is then recorded. Teams track how often users login, what features they interact

with, their currency usage and much more. Additionally, the order of which players play and do things in game is tracked and the types of data collected can often be game specific (Sides). This information is feedback to the development team but interpretation can be difficult. The information is stored in the cloud-based data warehouse and condensed into quantitative metrics for the development team. Developers then write SQL calls to receive this information. SQL needs to be written properly otherwise the calls can bog down the database (Sides). The team proceeds with game development based on information from the database.

Once a game has installs it is the job of the development team to keep the users in game. Their goal is to provide the user with an ever-improving experience that keeps them playing and spending money. Development of new features and solving of problems is where Big Data steps in. Big Data allows EA teams to locate what needs their attention and improves development efficiency.

Efficiency always seems to be the trend with Big Data and at EA it is no exception. Big Data helps development teams prioritize what needs work. If a feature is being developed, then a designer creates a design doc which is distilled into user stories. The user stories are assigned to the proper developers, engineers, artists, and UX/UI designers for evaluation (Sides). Prioritization is key. For example, is this new feature as much of a priority as fixing a UI issue on the main menu? Mr. Sides always asks the question, “Will the user be bother by it?” In short, the team works on what has the best return on investment. If the feature allows the game to generate more revenue and the UI issue is merely cosmetic, then perhaps they develop the feature. No matter the outcome, once prioritization is set, team leads can better allocate resources. This loop of feedback to prioritization to development is the cycle of live service and

is the preferred method of EA Mobile. For example, based on user interactions and feedback data the development team on *Secret Life of Pets Unleashed* found that releasing 20 new levels every two weeks was the ideal live service content model for them to keep users happy. Overall, Big Data can save huge amounts of time and money in the development process.

The EA Consumer Insights Team is task with figuring out what users enjoy and don't enjoy from a more qualitative approach. They learn about users' design preferences. This helps developers understand what types of designs they should create. CSAT is a customer satisfaction score and the Consumer Insights Team will use short, pop up survey's to learn more about the users than just the numbers (Sides). This is qualitative metrics that help the developers set priorities. Consumer insights assure developers develop in the right direction during live service, and even before launch.

As demonstrated, Big Data makes better games. Mr. Sides said "Data is incredibly important and a part of everything at the end of the day". Big Data is the ultimate user-testing-pool and provides unparalleled feedback to improve games, create better add-ons and sequels. Through data, teams can determined what features to include from past games and which ones to innovate. Data analytics can pinpoint when players are lost in the tutorial funnel and how to get them in the game quicker (Sides). Lastly, Big Data sets priorities and creates efficiency. All of the above are important parts of game development; however, EA goes a step further and couples the data with AI.

At EA Mobile, machine learning and AI are put into the development process as helpful assistants. Raw data is collected and used to create artificial intelligence that plays levels in *Secret Life of Pets Unleashed*. First, a level designer will build and design a level. Once they

believe it is suitable they will run the AI, because it can playtest much faster than a human and at a continuous rate. Designers examine the results from the AI playtest to see if the level has the right timing and feel. Interestingly enough, top players at the end of the game can usually complete levels faster than the AI (Sides). In the past, EA used to create AI predictive churn models. Churn occurs when players quit the game. AI would track trends in users who did quit in order to predict when current users would quit. If a user is about to quit, the game would then offer the player some form of incentive to keep playing, such as a better loot drop or free currency. Once again, the developers' objective is to keep the players in game and serve the users' needs.

EA uses a scalable cloud-based data warehouse to store all of the data generated from their many titles. EA uses Amazon Web Services (AWS) and their Amazon Redshift program. Amazon Redshift is scalable cloud storage allowing EA to shrink or expand their database in correlation to how much data they need and have. The game team and marketing team are then able to access the database with the proper credentials (Sides). However, due to the anonymous tracking no information in the database can become Personally Identifiable Information (PII). This is very important to EA and its security.

EA values security and management of its data. In EA's Privacy and Cookie Policy they state, "Security of our players' information is a priority at EA, and we take a range of measures to help protect it, including encryption of sensitive financial information. Even so, no security measure is 100% perfect. This means we cannot guarantee the security of your information and do not assume any responsibility for the unauthorized use or access to your information under our control" ("Privacy Policy"). EA policy establishes clear expectations and disclosures that

limit their liability. All the same, back in June, EA brought on Matt Thomlinson as their new Security Engineering & Chief Information Security Officer (CISO) to enhance the security of "player information and gameplay experiences" ("Announcing a New Security Executive"). EA has centralized teams that handle the data management, structure and security; therefore development teams don't have to worry about protecting the data they use. As a result, EA sets a high but generally accepted standard of data protection. However, they still share information with third parties, and as learned from the interview with Mr. Sides, EA believes it is crucial that data never becomes Personally Identifiable Information ("Privacy Policy"). EA will never share any personally identify information with third parties without an individual's consent. Anyone accessing this data or general game data must have the proper credentials such as correct port, IP and so on (Sides). These credentials have to be provided by the database administrator strictly limiting who has access. Furthermore, EA continually manages and removes unnecessary data. Analytics data is stored for roughly six months and then it is deleted. Raw data, usually involved with machine learning, is kept for as long as is necessary (Sides). Developers will clean out the database; however that is low priority. Nonetheless, EA only takes what data is required to increase efficiency and further development.

EA demonstrates a positive Big Data practice that enables them to provide a better service. Backing up EA's data policy, their management of data, including storage and security, seems to be superb. Even though they do track and collect huge amounts of data, it is done to further game development. Unfortunately, most users are unaware of their option to opt out. It is important that individuals don't fear Big Data and machine learning but rather seek to understand it as there are many benefits. Big Data allows for lower CPI with more targeted

marketing to get installs on a game. Game development is more efficient and user-friendly, all while saving money. Games are not just a product anymore; they have become a live service. Through Big Data, EA is able to serve their users like never before.

Works Cited

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