

## Zynga Wins with Business Intelligence

### CASE STUDY

The world's fastest growing gaming company doesn't boast top-of-the-line graphics, heart-pounding action, or masterful storytelling. It doesn't make games for the Playstation, Xbox, or Wii. The company in question is Zynga, and if you have a Facebook account, odds are you're already well aware of its most popular games. Zynga's explosive growth illustrates the potential of social gaming and the ability of social networks to provide critical data about a company's customers.

Founded in 2007 by Mark Pincus and a group of other entrepreneurs, Zynga is the leading developer of social network games, such as *CityVille*, *Texas HoldEm Poker*, and *FarmVille*. These games, along with Zynga's *Empires & Allies* game, are the four most frequently used applications on Facebook. Zynga's games have over 290 million monthly active users and 65 million daily players whose gaming keystrokes and clicks generate 3 terabytes of data every day. Since its inception, Zynga has put a priority on data analytics to guide the management of its games and the business decisions of the company.

The company relies heavily on its data to improve user retention and to increase collaboration among its gamers. In the words of Ken Rudin, chief of data analytics at Zynga, to be useful, data must be "actionable"—it has to be information that allows Zynga to make noticeable improvements to its games. Generating and storing game data is only half of the battle. Zynga also uses two analytics teams—a reporting team and analytics team—to work with the data and make concrete recommendations for business improvements based on that data.

There are three key metrics that drive the economics of social gaming: churn rates, the viral coefficient, and revenue per user. Churn, which we discuss in Chapter 9, is the loss rate of game players. Social gaming can have an extraordinarily high churn rate, about 50 percent per month on average. That means that half the new players signing up for a game today will be gone in a month.

The viral coefficient is a measure of the effectiveness of existing game players for drawing new players, an important capability for social network platforms. For example, if 100 Farmville users are likely to cause 5 of their friends to sign

up in a given month, that would result in a viral coefficient of 1.05.

Expected revenue per user is an estimate of the lifetime revenue that a game player will generate, based on an estimate of monthly revenue per user and the churn rate. For instance, if the average monthly revenue is \$5 per user and the churn rate is 50 percent, the expected revenue can be estimated as \$5 the first month + \$2.50 the second month + \$1.25 the third month, and so forth, or approximately \$20.

The first wave of social gaming applications on Facebook tried to increase the viral coefficient with Wall postings advertising in-game actions by players. This approach created too much "Wall spam," or game-related postings that made it difficult for social network users to identify posts by friends. Facebook and other social networking platforms then demanded that gaming firms reduce their Wall spam.

As a result, Zynga turned to social graph analysis. For social games, the "social graph," or relationships between friends, is somewhat different from that of the social networking platform itself. For example, in Zynga's *Mafia Wars* game, players might have two types of friends—those who actively play the game and a more passive group that signed on to help expand a friend's Mafia organization and then leave the game or play very infrequently. Players don't always interact the same way with these two groups, with gifts and offers of help more frequent within the active group. Guiding game players to communicate appropriately with these different types of relationships helps increase revenue and virality while reducing churn. A social gaming company such as Zynga will thus try to improve the player experience to make every aspect of the game more profitable.

Technology from Vertica Systems, an analytic database management company, helps solve this problem. Vertica's Massively Parallel Processing (MPP) architecture enables customers to deploy its analytics platform using industry standard hardware or cloud solutions as building blocks called "nodes." Users can build clusters consisting of 1, 10, or 100 or more nodes, putting thousands of processors, terabytes of computer memory, and petabytes of disk storage to work as a single parallel cluster.

A small start-up company can deploy Vertica on a single node, adding new nodes as needed.

Vertica's data warehouse is columnar, which means that data are stored in columns instead of rows. This allows Zynga's data to be more tightly compressed, at a rate of 10 to 1 (10 terabytes of data become 1 terabyte of compressed data). Vertica's data warehouse is able to work with this compressed data, which improves performance by reducing processor demands, memory, and disk input/output at processing time. Traditional database management systems can't work with compressed data. As a result, Zynga achieves rates of performance that are 50 to 100 times faster than the data warehouses used by other companies.

Vertica software is also able to manipulate the database for social graph analysis, transposing all of an individual user's interactions with other users into a single row, and it can do this quickly. Relational database platforms are unable to cope with the massive volume of data created by all the connections in a social graph.

Zynga's social graph-related data are streamed in real time to a dedicated Vertica cluster where the graph is generated daily. Every night, the models resulting from this graph are fed back into its games for use the next day. Zynga runs as many as 130 experiments to tweak and adjust its games each day and then observe how players react. Within minutes after releasing a new feature, Zynga is able to find out whether millions of players liked it or not. On the basis of this new knowledge, Zynga may make as many as 100 daily updates to its products.

With this business intelligence solution, Zynga has been able to improve the targeting of items such as gifts to effectively increase the level of interaction between active players while minimizing spam to passive players. Zynga is now in a position to identify groups of users with similar behavior or common paths for even more precise targeting of game-related promotions and activities.

Zynga's revenue rose from \$121 million in 2009 to \$1.14 billion in 2011. Clearly, Zynga's methods are working. Traditional game-makers like Activision Blizzard and Electronic Arts are noting Zynga's growth and success and have moved towards a similar business model. For example, Electronic Arts launched a free Facebook version of the classic game *The Sims*. The game now has 40 million active monthly players and was Facebook's fastest growing app for much of 2011.

Zynga's business model is to offer free games geared towards a larger, more casual gaming

audience, and to generate revenue by selling virtual goods in game. The idea of virtual goods has been around for years, most notably in *Second Life* and other virtual worlds, where users can buy apparel and accessories for their avatars. But Zynga's attention to detail and ability to glean important information from countless terabytes of data generated by its users on a daily basis has set it apart.

For example, product managers in Zynga's *FishVille* Facebook game discovered that players bought a certain type of fish in game, the translucent anglerfish, more frequently than the rest. Zynga began offering fish similar to the anglerfish for about \$3 apiece, and *FishVille* players responded by buying many more fish than usual. Analytics have also shown that Zynga's gamers tend to buy more in-game goods when they are offered as limited edition items. Zynga sells advertising, both in and around its games, but the vast majority of its revenue comes from its virtual goods sales.

Zynga also benefits from using Facebook as its gaming platform. When users install a Zynga application, they allow Zynga access to all of their profile information, including their names, genders, and lists of friends. Zynga then uses that information to determine what types of users are most likely to behave in certain ways. Zynga particularly hopes to determine which types of users are most likely to become "whales," or big spenders that buy hundreds of dollars of virtual goods each month. Though only 5 percent of Zynga's active users contribute to corporate revenue, that subset of users is so dedicated that they account for nearly all of the company's earnings.

Zynga's games make heavy use of Facebook's social features. For example, in *CityVille*, users must find friends to fill fictional posts at their "City Hall" to successfully complete the structure. All of Zynga's games have features like this, but Facebook hasn't always fully supported all of Zynga's efforts. Zynga's Facebook apps were formerly able to send messages directly to Facebook members, but they disabled the feature after complaints that it was a form of spam. Still, if your friends use Zynga's Facebook apps, chances are you've seen advertisements encouraging you to play as well in your News Feed.

Zynga's success has disrupted the video game industry. Traditional video game companies begin with an idea for a game that they hope players will buy and enjoy, and then make the game. Zynga begins with a game, but then studies data to determine how its players play, what types of players are most active, and what virtual goods players buy.

Then, Zynga uses the data to get players to play longer, tell more friends, and buy even more goods.

Not everybody is thrilled with Zynga's data-driven approach to making games. Many game industry veterans believe Zynga's games are overly simplistic and have many of the same game elements. The company has also been the target of several lawsuits alleging that Zynga copied other companies' games. Even developers within Zynga have sometimes bristled at the company's prioritization of data analysis over creativity in game design. Some question Zynga's ability to prosper over the long term, saying it would be difficult for the company to create new games to replace old ones whose novelty is fading. In 2011–2012, the average amount of revenue from Zynga's core users dropped 10 percent even though its overall number of users expanded. Zynga's business model also assumes Facebook will continue to operate in the same manner and that customers will continue to expect the same quality of games. That may not always be the case.

In other words, Zynga's games lack artistry. But Zynga readily admits that its target audience is the segment of gamers that prefer casual games, and its goal is to make games that nearly anyone can play. Gamers that want a game requiring high levels of skill or sophisticated graphics can get their fix elsewhere. Zynga is using the measurability of Facebook activity to guide its game management, and this is helping the company create a finely tailored user experience that hasn't been seen before in gaming.

To reduce its reliance on Facebook, Zynga introduced its own independent gaming platform called Project Z in March 2012. The new platform enables customers to play some of Zynga's popular titles from its Web site rather than by accessing them through Facebook. A service called Zynga With Friends will match up players who do not know one another and might not have Facebook profiles or might be playing the game on a mobile application.

That same month Zynga announced it had purchased OMGPop Inc., the maker of the popular

*Draw Something* mobile game, which asks players to make sketches illustrating words and have others guess what they drew. Zynga's management hopes that *Draw Something* will be part of a larger plan to build a mobile gaming network based on a portfolio of mobile, casual, and social games across a variety of social networks and platforms. DreamWorks Animation will work with Zynga to place additional advertising within the game, creating another new source of revenue.

Will these efforts be enough to sustain Zynga's competitive advantage? Will Zynga's business model hold up as more of the Internet goes mobile? It's still too early to tell, but you can bet that Zynga will be poring over the data to find out.

**Sources:** David Streitfeld and Jenna Wortham, "The News Isn't Good for Zynga, Maker of FarmVille," *The New York Times*, July 25, 2012; Jenna Wortham, "Zynga's Plan to Get Its Groove Back: More Games and Social Upgrades," *The New York Times*, June 26, 2012; Lance Ulanoff, "Zynga Wants to Be a Mobile Gaming Network," *Mashable*, May 30, 2012; Ian Sherr, "Game Changer for Zynga: No Facebook," *The Wall Street Journal*, March 1, 2012 and "Zynga Defends Acquisition," *The Wall Street Journal*, May 24, 2012; David Streitfeld, "Zynga Seeks to Match Up Players for Online Games," *The New York Times*, March 1, 2012; Nick Wingfield, "Virtual Products, Real Profits," *The Wall Street Journal*, September 9, 2011; "The Impact of Social Graphing Analysis on the Bottom Line: How Zynga Performs Graph Analysis with the Vertica Analytics Platform," [www.vertica.com](http://www.vertica.com), accessed June 2, 2012; and Jacquelyn Gavron, "Vertica: The Analytics Behind all the Zynga Games," *ReadWrite Enterprise*, July 18, 2011.

## CASE STUDY QUESTIONS

1. It has been said that Zynga is "an analytics company masquerading as a games company." Discuss the implications of this statement.
2. What role does business intelligence play in Zynga's business model?
3. Give examples of three kinds of decisions supported by business intelligence at Zynga.
4. How much of a competitive advantage does business intelligence provide for Zynga? Explain.
5. What problems can business intelligence solve for Zynga? What problems can't it solve?