INTERACTIVE SESSION ORGANIZATIONS

Data Changes How NFL Teams Play the Game and How Fans See It

All professional sports teams today collect detailed data on player and team performance, fan behavior, and sales, and increasingly use these data to drive decisions about every aspect of the business—marketing, ticketing, player evaluation, and TV and digital media deals. This includes the National Football League (NFL), which is increasingly turning to data to improve how its players and teams perform and how fans experience the game.

Since 2014 the NFL has been capturing player movement data on the field by putting nickel-sized radio frequency identification (RFID) tags beneath players' shoulder pads to track every move they make. The information the sensors gather is used by NFL teams to improve their training and strategy, by commentators on live game broadcasts, and by fans attending games or using the NFL app on the Xbox One.

The NFL's player tracking system is based on the Zebra Sports Solution developed by Zebra Technologies, a Chicago-based firm specializing in tracking technology that includes the bar codes on groceries and other consumer goods and radio frequency identification (RFID) technology. The Zebra Sports Solution system records players' speed, direction, location on the field, how far they ran on a play, and how long they were sprinting, jogging, or walking. The system can also determine what formation a team was in and how players' speed or acceleration affects their on-field performance. Want to know how hard Eli Manning is throwing passes or the force with which a ball arrives in the hands of receiver Odell Beckham? The system knows how to do all that.

NFL players have RFID chips in their left and right shoulder pads that transmit data to 20 radio receivers strategically located in the lower and upper levels of stadiums to collect data about how each player moves, using metrics such as velocity, speed in miles per hour, and distance traveled. From there the data are transmitted to an on-site server computer, where Zebra's software matches an RFID tag to the correct player or official. The football also has a sensor transmitting location data. The data are generated in real-time as the game is being played. Each sensor transmits its location about 25 times per player.

It takes just two seconds for data to be received by the motion sensors, analyzed, and pushed out to remote cloud computers run by Amazon Web Services for the NFL. From the NFL cloud computers, the data are shared with fans, broadcasters, and NFL teams. The data captured by the NFL are displayed to fans using the NFL Next Gen Stats website, NFL social media channels, and the NFL app on Windows 10 and the Xbox One. The data are also transmitted to the giant display screens in the arena to show fans during the game.

The data have multiple uses. NFL teams use them to evaluate player and team performance and to analyze tactics, such as whether it might be better to press forward or to punt in a particular fourth-down situation. Data transmitted to broadcasters, to stadium screens, to Next Gen Stats, and to the Next Gen Stats feature of Microsoft's Xbox One NFL app help create a deeper fan experience that gets fans more involved in the game.

Some of the statistics fans can now see on Next Gen Stats include Fastest Ball Carriers, Longest Tackles, Longest Plays, Passing Leaders, Rushing Leaders, and Receiving Leaders. Next Gen Stats also features charts for individual players and videos that explain the differences and similarities between players, teams, and games based on the data.

While the data may be entertaining for fans, they could prove strategic for the teams. Data markers for each play are recorded, including type of offense, type of defense, whether there was a huddle, all movement during the play, and the yard line where the ball was stopped. The NFL runs custom-created analytics to deliver visualizations of the data to each team within 24 hours of the game, via a custom-built web portal. The system displays charts and graphs as well as tabular data to let teams have more insight. Each NFL team may also hire its own data analyst to wring even more value from the data. The data are giving NFL fans, teams, coaches, and players a deeper look into the game they love.

Sources: Jason Hiner, "How the NFL and Amazon Unleashed 'Next Gen Stats' to Grok Football Games," *TechRepublic,* February 2, 2018; Teena Maddox, "Super Bowl 52: How the NFL and US Bank Stadium Are Ready to Make Digital History," *TechRepublic*, February 1, 2018; Brian McDonough, "How the NFL's Data Operation Tracks Every Move on the Field," *Information Management*, December 7, 2016; www.zebra.com, accessed March 15, 2017; and Mark J. Burns, "Zebra Technologies, NFL Revamp Partnership For Third Season," *SportTechie*, September 6, 2016.

CASE STUDY QUESTIONS

1. What kinds of systems are illustrated in this case study? Where do they obtain their data? What do they do with the data? Describe some of the inputs and outputs of these systems.
2. What business functions do these systems support? Explain your answer.
3. How do the data about teams and players captured by the NFL help NFL football teams and the NFL itself make better decisions? Give examples of two decisions that were improved by the systems described in this case.
4. How did using data help the NFL and its teams improve the way they run their business?

performance of the organization as a whole. Figure 2.6 shows that the architecture for these enterprise applications encompasses processes spanning the entire organization and, in some cases, extending beyond the organization to customers, suppliers, and other key business partners.

Enterprise Systems Firms use **enterprise systems**, also known as enterprise resource planning (ERP) systems, to integrate business processes in manufacturing and production, finance and accounting, sales and marketing, and human resources into a single software system. Information that was previously

FIGURE 2.6 ENTERPRISE APPLICATION ARCHITECTURE

Enterprise applications automate processes that span multiple business functions and organizational levels and may extend outside the organization.