Case Study:
eBay Inc. Data Centers and the PI System

E-commerce powerhouse eBay.com reached a major milestone in December 2012 with more than 400 million listings. According to year-end data, eBay.com sellers sell an auto part every second; a vehicle every minute; a pair of retro sunglasses every two minutes. These plus its transactions through subsidiaries PayPal and GSI are powered by the most efficient and innovative data centers on the planet. The data centers are not only critical to connecting eBay Inc.'s ever-increasing community of buyers and sellers around the world, they also make up more than 50 percent of the company's global power usage. Dean Nelson, eBay Inc.'s Vice President of Global Foundation Services, recognizes "The foundation of our revenue is our data centers."

The past few years have brought evolving technologies and record demand to deploy new applications – a trend that is certain to continue. Through platforms such as its Digital Service Efficiency dashboard, eBay Inc. is honing in on the full cost, performance and environmental impact of customer transactions. At the same time, the company has made major strategic investments to consolidate its portfolio of data centers. Its new state-of-the-art data centers in the southwestern desert town of South Jordan, Utah and downtown Phoenix [pictured above] were designed as a response to these multiple demands. As outlined in a case study by Green Grid, eBay Inc.'s business objectives with these data center projects include: forward-thinking design, cost effectiveness, highest compute performance and flexibility.

The powerful software that allows eBay Inc. to prioritize and monetize every vital aspect of its data center operations is OSIsoft's PI System™, which gathers data from the com-

pany's multiple sensors and serves as a universal translator that synchronizes data center operations to boost efficiency, improve planning, and reduce overall IT and facility costs. It integrates into a wide variety of systems to track energy use, air handling and cooling, water use, humidity, integrated renewables, and even carbon reporting. The secure data acquisition layers provided by the PI System are especially suited for data centers, where reliability is paramount. According to Steve Sarnecki, OSIsoft's Vice President of U.S. Public Sector Sales, "What we can do is not only identify and capture savings across a system of systems – we can baseline that."

The PI System also offers eBay Inc. full scalability. With its 60,000 square feet of raised floor, for instance, eBay Inc.'s flagship data center is expandable by four times its current size. Continuous monitoring helps the company understand when to add new server racks equipped with real-time wireless monitoring outlets, assets and environmentals. Its server rollout process is optimized for rack-at-a-time and container-at-a-time deployments that minimize space while maximizing modularity, flexibility and scalability. This aligns IT costs with business goals as they evolve. The PI System provided the only scalable software capable of managing the more than 500,000 data streams eBay Inc. sought to capture at its data centers, according to eBay Inc. Distinguished Engineer Jeremy Rodriguez. From a business perspective, real-time data became a critical enabler in the company's successful efforts to reduce electricity usage and keep energy costs-per-transaction contained while growing technical infrastructure 32 percent. In addition to collecting environmental, IT and facility data from its electrical and mechanical systems, the PI System collects electrical utility data from eBay Inc.'s renewable energy generation sources.

In order to integrate real-time data into corporate decision making, as well as compare data center performance to original building design requirements, eBay Inc. presents its facilities and IT data as a single, holistic system with an enterprise-wide interface. In a single pane of glass, stakeholders can see the entire data center – all mechanical systems and electrical usage from the substation down to the server or branch circuit. A select few engineers and executives can remotely review data center operational summaries such as IT load and Power Usage Effectiveness (PUE) and perform con-

dition based maintenance. eBay Inc. is one of the first companies to formally report PUE with transparency about how the data was collected and reported. Its flagship data center in Salt Lake City was designed for an annualized PUE no greater than 1.15, which amounts to "huge savings," says John Coster, Vice President at Skanska Mission Critical, which led construction of the data center. Meanwhile, eBay Inc.'s Phoenix Modular Data Center is routinely achieving partial PUEs below 1.05, even at temperatures as extreme as 119 degrees Farenheit, Rodriguez says.

But "PUE is just the beginning," according to Serena DeVito, eBay Inc.'s Advanced Data Center Engineer. Another tool eBay Inc. utilizes is Total Cost of Ownership (TCO) metrics, which factor in the cost of the server plus total cost of the energy it will consume while running a specific workload over its lifetime. With the PI System, eBay Inc. possesses a deep understanding of minute-by-minute fluctuations in its IT workloads. The PI System provides eBay Inc. a solution for TCO that is akin to third-party validation, Coster says, and the company would not be able to reach the savings it has achieved without it. The savings from these strategic investments are not only paying for new technology investments across eBay Inc.'s data center portfolio, they are decreasing network latency and enabling long-term infrastructure scale. The PI System allows eBay Inc.'s critical data centers to baseline for continuous improvement, delivering value now and value over time.