

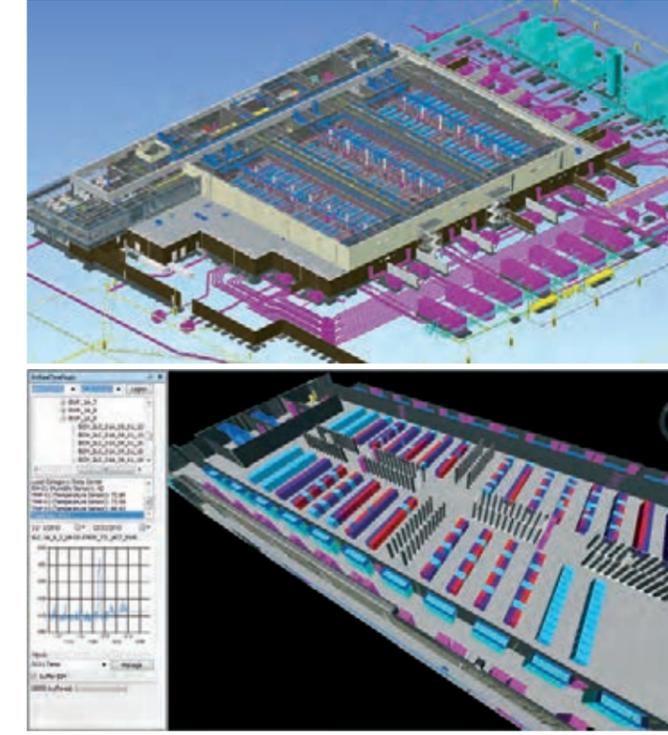
BIM in Industrial Projects

eBay Inc., Project Topaz

South Jordan, Utah, United States



Image: Dave Whitcomb / RTKL



eBay, inc., Project Topaz	
Client	eBay, Inc.
Location	South Jordan, Utah
Architect	RTKL
Total size	245,000sf (23,000m ²)
Raised floor area	50,000sf (4,600m ²)
Delivery method	Design-build
Start date	December 2008
Completion date	April 2010
LEED® certification	LEED Gold
Tier level	Tier IV

Project Topaz, a new data center for eBay, is about the size of a football field. Similar to processing plants, large-scale data centers are filled almost exclusively with mechanical and electrical equipment. They are complex systems of hundreds of machines that have to work in finely tuned unison and without interruption. In the data center industry continuous operation is referred to as uptime and traditionally has been by far the most critical of many detailed performance metrics.

Because the energy and carbon footprint of data centers has been increasing rapidly, sustainability and energy efficiency has become ever more important. Energy efficiency requirements are met for example by continuously measuring equipment performance, performing analytics and most importantly keeping that data for future correlation and cross-referencing. BIM can be used as a connective element to map equipment performance to a larger context – the facility.

Skanska extensively utilized virtual design and construction (VDC) methods and employed a lean delivery approach to construct and commission the project in only 14 months. Successful BIM coordination between project team members allowed efficient design and construction that was essentially free of change orders and coordination conflicts. In addition, it supplied the client with a detailed 3-D model that represents the as-built conditions in the operational facility.

The project team leveraged the virtual 3-D model further by integrating it with the plant's building main-

tenance and automation systems. As a result, it is now used as a comprehensive portal to obtain information and statistics for every piece of equipment in the facility. The integrated model can be accessed from remote workstations or from hand-held devices. When in use tablets allow facility and maintenance staff to access various documents, such as commissioning reports, and operation and maintenance manuals in the immediate vicinity of the plant's equipment.

As an early adopter, eBay's facility utilizes a multidisciplinary monitoring and archiving system that continuously observes most of the electrical, mechanical and IT systems. Current and historic metrics of hundreds of thousands equipment properties can be obtained directly through the virtual model, including temperatures, flux and pressures for mechanical systems, as well as power consumption and utilization for electrical and IT equipment. Such granular data is crucial to continuous improvement of the plant's performance and efficiency.

Through a variety of illustration techniques used on the web, in print and media, one has become accustomed to color-coded maps that display weather data, home prices or population statistics. The exact same mash-up techniques are used at Topaz to visualize highly complex data sets very clearly through the virtual model. For instance, temperature readings of a server room or power draw of IT cabinets are displayed in real time. Piping systems are colored dependent on pressures measured inside them.

It is fundamentally important to address efficiency, operations and maintenance strategies during design and preconstruction. This provides a project delivery system that integrates both construction and operational aspects. Skanska recognizes that the construction industry must develop beyond the physical build. Today Skanska has the ability to deliver equipment databases, knowledge libraries and integration of real-time monitoring solutions, providing a streamlined transition from construction to operation.