



Power protection in retail applications

As modern technology fashions a new shopping experience, fresh challenges are being rung up for the retail industry

Thanks to technological advancements such as the Internet of Things (IoT), digitization and artificial intelligence (AI), today's retail experience is no longer one-size-fits-all.

The retail industry is undergoing a revolution, driven in large part by big data. Not only is the storefront changing, but so are the requirements to ensure that both data and electronic equipment are properly safeguarded against potentially devastating power quality issues and outages. From traditional point-of-sale (POS) systems and workstations to the cameras, eye tracking and motion sensors now collecting real-time shopper data, there is no shortage of devices to protect. Moreover, a multitude of systems that interface with customers are connected to analytics applications that generate data, which retailers are relying on to help them make better business customer decisions, from optimizing store layouts to delivering promotions they care about.

The price tag for power outages

There are no bargains to be found when it comes to the effects of blackouts in the industry, as retail ranks among those with the highest risk. When a Pennsylvania supermarket lost power for a day in February 2019, the owner estimated losses of up to \$30,000 in spoiled merchandise alone. Meanwhile, Black Friday turned into Blackout Friday for 2019 holiday shoppers at South Coast Plaza in Costa Mesa, Calif., after an electrical-vault explosion triggered an outage. Those eager to snatch up holiday deals were instead blocked from stores on the busiest shopping day of the year, with the power cut suspending cash register operation for about two hours.

In addition to causing equipment damage and data loss, in some instances an unplanned outage can even force a company to go out of business. That's because it only takes a momentary power glitch to trigger a hefty toll, with [Gartner](#) estimating the average cost of IT downtime at \$5,600 per minute. While small businesses certainly endure hardships from outages, the cost of downtime to large retailers is even more extreme. For an organization like Amazon whose entire business model relies on uptime, estimated costs exceed \$13 million per hour. The bad news unfortunately doesn't end there, as the propensity for blackouts continues to magnify. A [report](#) conducted in collaboration with Frost & Sullivan found that one in three retailers lost power at least once a month in 2017, with about 40 percent of those outages lasting longer than an hour.

Sometimes outages can even drag on for days. That was the reality in 2019 throughout much of California, as utility companies initiated multiple public safety power shutoff (PSPS) events in an attempt to prevent electrical equipment from igniting wildfires amid dry, whipping winds. The massive preemptive cuts collectively impacted nearly 3 million customers across the state in October alone, forcing some companies to close for days. In another instance, a Greensboro, N.C., JCPenney had to close indefinitely following a February 2020 outage caused by a major electrical failure. The store was waiting on a temporary generator to be installed before reopening.

It's important to recognize that the effects of power outages in the retail industry extend beyond ruined goods or lost sales; a business' reputation is often tarnished when it is unable to effectively serve customers, making them less likely to return.



Powering Business Worldwide

The changing face of retail

In recent years, physical storefront owners have been forced to seek new and innovative ways to lure and retain customers amid the rising popularity of online shopping. It is predicted that the U.S. will see 300 million online shoppers in 2023—representing 91 percent of the country’s population in large part due to the increased speed and convenience offered by the shopping experience. To better compete, retailers have been sampling an extensive range of technological novelties designed to improve the customer experience and in turn, boost sales.



For instance, some stores use POS systems linked to tablets that enable staff to process transactions anywhere on the floor, while in other locations shoppers can scan barcode tags with their smartphones and capture product information such as choice of color and features. If you ever feel like someone is watching you peruse the aisles, you probably aren’t imagining it: AI cameras are now able to recognize VIP customers when they enter a store, allowing staff to immediately greet these shoppers. Meanwhile, patrons who pass in close proximity to digital signage boards can be recognized by age, gender or even past history—prompting related merchandizing information to immediately appear on the screen. For example, Amazon’s physical bookstores use online and in-store generated data to determine what books to display to a particular customer. And Walgreens has been testing digital refrigerator and freezer doors that feature screens equipped with cameras, eye tracking and motion sensors. The devices collect real-time shopper data to stimulate relevant ads or promotions.

Cameras aren’t the only shopper-identification device; WiFi systems now recognize customers who previously signed up to connect



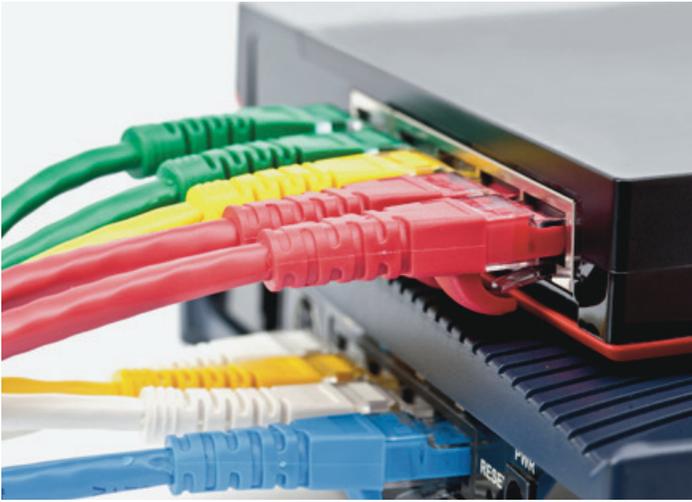
their smartphones while in-store, allowing retailers to provide them with personalized coupons. Thanks to another tool, infrared beacon technology, heat maps are being generated that demonstrate consumers’ in-store traffic patterns, helping store owners to better lay out the space.

Other IoT-driven backroom technology such as radio-frequency identification (RFID) and real-time point of sale systems are being implemented to improve the accuracy of inventory tracking throughout the supply chain. For instance, smart shelves fitted with weight sensors are popping up across the retail industry. Using RFID tags and readers to scan the products on display, these digital technologies provide retailers the ability to detect and manage shelf inventory using machine learning and image/object recognition technology. The shelves can track and quickly alert retailers when items need to be restocked, preventing a missed sales opportunity and a disappointed customer.

Today’s shoppers not only want immediate access to products, they also desire instant payment options. As a result, the retail industry has been rapidly adopting and integrating mobile payment applications that reduce the time spent standing in line, such as PayPal, Samsung Pay, Apple Pay, AliPay and WeChat Pay. It is estimated that in 2020, more than 1 billion people worldwide will use a mobile payment app to pay in-store at least every six months, with the average consumer now completing 18 mobile payments in-store per month.

Clearly, retailers that embrace digital transformation and leverage new technologies are able to enhance the customer experience both online and in-store, as well as optimize supply chains and develop new revenue opportunities. While these advancements are undeniably providing many new opportunities to create innovative experiences for shoppers, at the same time they open the door to some considerable challenges.





Living on the edge

In order to meet customers' rising expectations for their shopping experiences, retailers are increasingly turning to edge computing. By allowing them to process, analyze and take action on data closer to the customer—rather than in more traditional, centralized servers and systems—edge applications help retailers capitalize on new trends while relying on the cloud for storage.

Because traditional IT architectures struggle to accommodate edge cloud workloads, moving to a distributed edge architecture can help IT departments adapt to meet IoT needs. For instance, out-of-the-way server closets can house the infrastructure and applications that enable real-time processing of systems without the lag or cost that might occur if the data had to constantly travel back and forth to the cloud.

Edge computing can also improve the security and safety of store locations. For instance, a blacklisted or suspicious individual entering a store can be picked up by an edge camera, which will immediately alert store personnel. Many retailers are also depending on edge computing infrastructure to offer insights into how best to leverage their technological resources and achieve the highest level of operational efficiency. Edge computing can also be instrumental in helping retailers gather insight into shopper behavior through data collected through both physical or online services.

Protecting the customer experience

For today's retailers, the customer experience often represents the key to success, regardless of whether the shopping platform is web, mobile or physical storefront. Not only are shoppers in new places, but consumer expectations are rising around real-time access to merchandise, order information and anytime-anywhere services. As a result, there is more pressure than ever for retailers to ensure continuous uptime and high availability.

Uptime of retail IT systems is essential to the continuity of operations. Check-outs, goods inward systems and POS terminals must be protected from unexpected downtime and data loss in order to ensure business continuity. Systems such as inventory management, workforce management, supply chain management, and transaction processing are equally vital. Retailers who can effectively store, manage, administer and protect the data within their shopping environments have the opportunity to maximize new technologies and optimize sales.

However, modern technology is not without its risks. Potentially devastating downtime threats, intensifying security concerns and essential remote management requirements are forcing organizations to rethink how they will implement a strategic, end-to-end approach to power management in these new environments. Uninterruptible power supplies (UPSs) and other power management products provide a compelling value proposition to keep retail IT infrastructure up and running. Yet managing this environment requires careful planning and deployment of the proper solutions.



Power solutions that empower store managers—rather than require IT expertise



When it comes to ensuring power protection in today's retail applications, there's a new shopping list of requirements, with the ability to "set it and forget it" topping the list. While retailers may recognize the need to secure power in edge and distributed IT environments just like they would an enterprise data center, they face an additional challenge: most of these locations will not have an IT pro on site. For that reason, power protection solutions that decrease the complexity of retail operations and reduce or eliminate the need for human intervention are proving vital for edge applications.

Retailers need solutions that allow them to gain visibility into their power protection infrastructure and proactively respond when needed; keep operations up and running without interruption at stores; and ensure that salespeople remain focused on selling, rather than on attempting to remedy power ailments.

A new generation of power protection is evolving to accommodate these needs, with solutions focused on:

Remote capabilities and power management software/ connectivity	Because few retail employees are well-versed in technology, there is a growing need for power systems to run seamlessly, making remote management capabilities and PDUs essential. From delivering secure edge application updates to debugging in the event of an issue, remote capabilities eliminate the need for skilled personnel to be on site to deploy and manage the solution on a daily basis. Meanwhile, switched outlets on both rack PDUs and UPSs allow IT pros to quickly perform tasks such as rebooting a locked-up device. Furthermore, because hardware is often installed in a network closet or remote location, a UPS's blinking LED warning could easily go unseen, further underscoring the value of remote notification and alerts provided through power management software. Fashion giant Ralph Lauren was able to achieve exceptional uptime and business continuity by rolling out a comprehensive power protection monitoring solution that was anchored in remote power monitoring and management. Furthermore, Grandeur Housing deployed Eaton Intelligent Power Manager (IPM) and PDUs to bolster network security by performing a daily air gap. Also important is temperature and humidity monitoring with environmental monitoring probes.
Highly reliable UPSs and enclosures	With retailers demanding small power systems in close proximity to network switches and other devices that facilitate connection to cloud, the market has seen an upsurge in decentralized solutions. As IT priorities shift and more retail organizations invest in edge and distributed infrastructure, these firms need reliable solutions that can operate with minimal need for on-site support and maintenance, while increasing security and enhancing business continuity. IT pros are also embracing secure wall-mount enclosures to prevent unauthorized access to IT equipment with products such as the Eaton MiniRaQ. In larger applications, emergency lighting UPSs can be essential for parking lots and deck safety, in addition to store lighting
Lithium-ion batteries	Uniquely qualified to handle edge computing's load requirements, lithium-ion batteries offer an eight- to 10-year life cycle compared to traditional valve-regulated lead acid (VRLA) batteries, which generally need to be replaced every three to four years. As a result, they reduce or eliminate maintenance and replacement requirements that aren't aligned with other IT refresh cycles.
Enhanced cybersecurity	The proliferation of smart, connected devices and ever-expanding server-gateway connections has created an unprecedented opportunity for hackers and cyber criminals. Experts predict there will be some 75.4 billion connected devices by 2025, making cyberattacks a huge concern for retailers. As such, it is essential to ensure that power protection solutions remain secure and resilient, concerns that manufacturers are now addressing in their UPSs, network cards, software and power distribution units (PDUs). For example, IEC 62443-4-2 provides the cybersecurity technical requirements for embedded devices, network components, host components and software applications. In addition, UL issued UL 2900 standard for software cybersecurity for network-connectable devices, while the state of California passed SB-327, which requires manufacturers of devices that connect "directly or indirectly" to the internet to equip it with "reasonable" security features.

Conclusion

As retailers continue to increase their reliance on access to the network for activities ranging from targeted customers marketing to inventory management to transaction processing, the need for continuous, clean power remains paramount. With so much IT infrastructure now residing locally, a premium, well thought-out power protection solution is absolutely essential to preserve the retail industry's electronic equipment and massive amounts of data.

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