



Intelligent Building Advances in the Quick Service Restaurant Industry

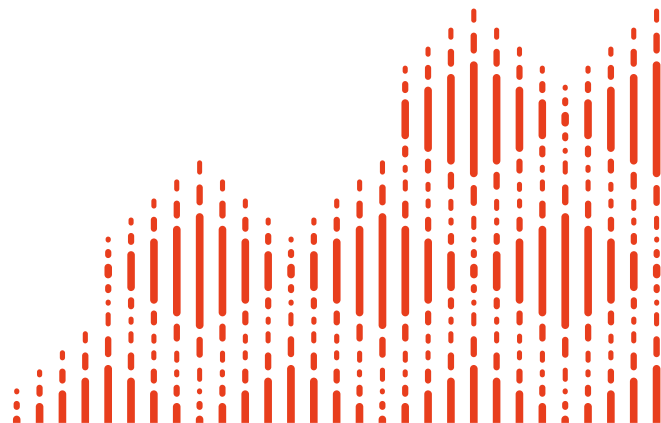
A CABA WHITE PAPER

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Advances in the Quick
Serve Restaurant
Industry**

A CABA White Paper

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ABOUT CABA

The Continental Automated Buildings Association (CABA) is an international not-for-profit industry association, founded in 1988, and dedicated to the advancement of intelligent home and intelligent building technologies. The organization is supported by an international membership of over 350+ organizations involved in the design, manufacture, installation and retailing of products relating to “Internet of Things, M2M, home automation and intelligent buildings”. Public organizations, including utilities and government are also members. CABA's mandate includes providing its members with networking and market research opportunities. CABA also encourages the development of industry standards and protocols, and leads cross-industry initiatives. CABA's collaborative research scope evolved and expanded into the CABA Research Program, which is directed by the CABA Board of Directors. The CABA Research Program's scope includes white papers and multi-client market research in both the Intelligent Buildings and Connected Home sectors. www.caba.org

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The CABA Intelligent Buildings Council (IBC) works to strengthen the large building automation industry through innovative technology-driven research projects. The Council was established in 2001 by CABA to specifically review opportunities, take strategic action and monitor initiatives that relate to integrated systems and automation in the large building sector. The Council's projects promote the next generation of intelligent building technologies and incorporate a holistic approach that optimizes building performance and savings. www.CABA.org/ibc

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1. EXECUTIVE SUMMARY

The Quick Service Restaurant (QSR) industry is one of the most dynamic segments of the food industry and its competitive landscape has further divided with the addition of fast-casual restaurants. QSRs strive to be above the competition by diversifying menu offerings and modifying restaurant concepts. Similarly, the technology ecosystem of the QSR industry has expanded to include innovative Internet of Things (IoT) platforms and applications. While this advanced technology is promising, the current network of fragmented systems and platforms is not fully optimized. An integrated approach can fully leverage the connectivity of existing systems, such as the base building network, with IoT technology to increase operational efficiency, manage repair and maintenance, and control costs. Industry partners deliver technology solutions that can deliver energy savings, food cost reduction, equipment maintenance management, enhanced brand equity, and compliance on food safety regulations. The revolutionary applications on the front-end are enhancing the overall experience and customer loyalty. Similarly, on the back-end, smart building solutions provide data-driven analytics that facilitate new visibility into maintenance, operations, and cost control. The QSR industry needs to adopt and integrate these systems into fewer platforms quickly to fully leverage the benefits. In the cutthroat environment of the QSR industry, the quality of food and the consistency of the service will always remain the standard of success, and integrated digital technology will effectively aid QSRs in achieving that standard while improving operational efficiency and driving business growth.

2. INTRODUCTION

The landscape of the QSR industry has become increasingly competitive with the introduction of fast-casual restaurants. An alternative choice for consumers, the fast-casual restaurant combines the convenience of fast food with the quality of casual dining. This has resulted in an already saturated industry becoming even more crowded. Soaring food and energy costs, new regulatory mandates impacting labor costs, and compliance concerns over food safety are making the operators look for means to reduce costs and still maintain the restaurant's bottom line. Quick fixes such as marketing campaigns and promotions can only provide short-term solutions. To be a successful participant in the QSR market and sustain long-term growth, companies need to adopt a more sophisticated and integrated approach to data systems. Only this will produce maximum results and efficiency gains.

This is not to say the QSR industry is not one of the most dynamic segments of the food industry. The fast food industry in the United States is worth approximately \$198.9 billion USD. By 2020, this figure is forecasted to exceed \$223 billion. Canada and Mexico have many of the same fast food outlets and are also expanding. What was once dominated by traditional fast-food, such as burger and pizza restaurants, the industry is now experiencing diversity in both restaurant concepts and menu offerings. This evolution mirrors the ever-changing tastes and preferences of consumers. Today's consumers are busy and more health-conscious than previous generations. They are aware of their food choices and look for nutritious yet budget-friendly options. To cater to this growing market in North America, QSRs have diversified their menus to offer healthier options. Many companies have also responded by removing trans-fats and other unhealthy ingredients from their offerings. Furthermore, the common perception that QSRs are unhealthy is gradually changing, which is largely due to the introduction of fast-casual restaurants. Companies such as Chipotle, Cosi, and Panera Bread offer a wide variety of healthy offerings and are leaders in the fast-casual market. Coffee shops are adding more food items and some have bought fast food companies.

Technology innovation is a characteristic that is constantly driving QSRs to evolve. On the front-end, food ordering kiosks, food delivery apps, and electronic payments have gained momentum. Similarly, on the back-end, smart building solutions are providing heating, ventilating, and air conditioning (HVAC), walk-in refrigeration, sub-metering, and lighting controls to QSRs at an affordable price point. Remote equipment monitoring is reducing energy usage by monitoring energy-intensive devices such as HVAC. It also provides a cloud-based data analytics platform that lowers maintenance costs by providing alerts on problems, dispatching service technicians, and reporting performance to identify and resolve any issues. Digital technology makes operational processes more efficient, creates convenience for consumers, and facilitates a preventive approach towards food safety. The use of Big Data, collected from various platforms, to gain useful insights in business operations has already made its start in the QSR industry. The innovative systems and platforms used are very effective, but, businesses are not seeing transformational growth because the systems are fragmented. There is a great need for systems to be harmonized and for the development of a solution that can integrate all of the operator's needs into fewer platforms.

Currently, QSRs embrace the digital revolution and use technology in various forms. On the front-end, the point-of-sale (POS) is often the central technology. Surrounding the central POS system, there are other applications to manage such as online orders, loyalties and rewards, employee management, and supply chain management. On the back-end, there are various applications that seamlessly integrate with smart building solutions such as lighting controls, HVAC control, and smart metering. The key challenge for the QSR industry is to integrate

currently siloed systems into fewer platforms. Today's industry standard relies extensively upon manual processes and often is characterized by management extrapolating information from various platforms to forecast trends such as peak-hours and foot traffic, inventory and food wastage control, hardware maintenance and utility cost, and scheduling errors and labor cost. Even after this data is acquired, a different application is used to analyze the data and gain insights. This process can become a frustrating and time-consuming experience for the operators and their teams. Ultimately, this depresses QSR engagement with data-based technology solutions and produces suboptimal benefits for industry users.

Buildings today already have some level of intelligence built in. To optimize building automation, multiple building solutions must be integrated regardless of the manufacturer or the system integrator. Avoiding proprietary protocols and manufacturer lock-ins would ensure greater flexibility for integration. As more applications and platforms emerge to manage efficiencies, the need for integration of disparate IoT applications becomes crucial.

3. MARKET DRIVERS

The start of 2017 marked a minimum wage increase in 19 states across the United States. Some states increased wages based on the cost of living, some increased wages through ballot initiatives, and others did so as a result of legislation passed in prior sessions. The fight for increased minimum wage is an ongoing movement and a drive happening at national, state, and local levels. Canadian provinces are also increasing the minimum wage and regulating the food menus to show the calories counts. Regardless of the restaurant operators' stance, wage increases have a big impact on bottom line margins. After food, labor cost is highest for QSRs and the need to solve the complicated labor equation will be challenging. In addition, the labor pool for QSRs has become much smaller. Stringent laws on immigration from the new administration pose challenges to the size of the labor force willing to work minimum wage jobs. While wage increases can be seen as an opportunity to reduce high turnover and retain employees, business operators will need labor management technology to retain profit margins.

As the QSR industry continues to grow, legislators promoting food safety and standards look beyond existing practices and systems towards inspection and enforcement. For example, reforms in food safety laws, such as the Food Safety Modernization Act, aim to shift QSR focus from responding to the contamination of food supply to preventing it. The Food and Drug Administration (FDA) passed a legislative mandate that requires comprehensive, prevention-based controls across the food supply chain. Additionally, this will provide the FDA with the authority to issue a mandatory recall of any food product. The increased legal concerns and regulations around food safety drives the need for additional data with better accuracy. Traditional methods of paper-based checks and records are inefficient and prone to human error. IoT applications that monitor and record temperatures, track equipment remotely, and prevent chemical and biological hazards can ensure compliance and increase efficiency.

The cost of electricity is rising and the trend will continue. Several factors are contributing to the increase such as high cost of maintaining and upgrading a grid. Moreover, stringent regulations are driving coal and nuclear power plants to shut operations, which pressures utilities to invest large capital to build new plants as replacements. Costs incurred are ultimately passed onto consumers. Climate Change Plans with a price on carbon are being followed by some levels of government and industries. Having a clean and green environment is a strong consideration for many of the customers to the fast food restaurants. Similarly, maintenance and

repair costs of kitchen equipment are escalating, and it can quickly add up to hurt the bottom line. Smart building solutions provide operators with insightful data that facilitate implementation of cost control measures.

The increased competition within the QSR industry means restaurants will have to improve food and service quality while keeping their prices competitive. Because consumer preferences are constantly changing, restaurants need to cater to these changes while running an efficient operation. Automation and IoT platforms allow restaurants to monitor and control routine tasks without being dependent on human help, which ensures labor efficiency, consistency, and smooth operation. This allows the management to remain focused on improving the consumer experience and differentiating the QSR brand from the competition.

4. MARKET CHALLENGES

The digital technology revolution is penetrating the QSR industry quickly and its growth is significant. However, the benefits and return on investment of sophisticated information technology (IT) solutions are often summarized through intangible results, such as consumer satisfaction, which are hard to measure and often harder to objectively compare. With investments in new technology, restaurants are hesitant to be market leaders and instead opt for the wait-and-see approach, investing once a solution is tried and trusted. This reluctance is logical because training staff and incorporating technology is often time and cost intensive for employees and management. There is a learning curve to be accounted for, and initial hiccups and other glitches can be a big distraction from the company's core challenges and problems. Furthermore, process efficiency cannot be completely solved through the implementation of the latest technology. The processes can be inherently inefficient, which calls for an in-depth evaluation of the processes themselves.

The lack of understanding regarding how various systems and platforms cut costs and substantiate benefits is a challenge for a majority of the operators and facility managers. The savings on the company's bottom line cannot be clearly traced to the technological investments, leading the owners to undermine the value of the technology. For example, a reduction in a utility bill cannot be fully attributed to the new smart controller installed in the walk-in freezer. Various other factors such as seasonality could affect the usage and billing, which means verification can take some time.

With the growing number of IoT systems and applications vying to capture market share in the burgeoning industry, it can be an overwhelming experience to vet solutions. Should a mix of end-to-end (cloud-to-edge) solutions be selected and deployed, it can be overwhelming to manage the disparate components in each workflow and analyze the data collected. The lack of interconnectivity between the systems means timeliness and accuracy is often compromised when making business decisions. Additionally, systems and applications are often not utilized to their full potential and as such, the capital investments associated with those technologies can be hard to justify for restaurant owners. Without smooth interconnectivity and data interoperability, technology cannot be fully leveraged to optimize business processes and realize an optimal return on investment.

5. SOLUTION

IT solutions in the QSR industry can largely be bundled into categories, including energy savings, food cost reduction, equipment maintenance management, enhanced brand equity, and hazard analysis and critical

control points (HACCP) compliance. Within these categories, there are further segments that target improvements within the QSR industry. This fragmented solutions landscape can be seen as a barrier itself, but with each organizational change, a strategic plan and implementation timeline can help streamline the process. QSR customers are unlikely to target all areas as mentioned, and instead, key organizational challenges will be identified and corresponding solutions from industry partners will be prioritized. Most likely, QSR challenges can be attributed to a single or combination of the following categories, which present a reason to seek out a dedicated industry partner.

5.1 Energy savings

Energy is one of the biggest costs for QSRs. From freezers and fryers to ventilation and lighting, QSRs are one of the biggest consumers of energy. It is estimated that QSRs consume more energy per square foot than any other building in the United States¹. Energy-intensive kitchen equipment and heating/cooling appliances are running continuously, sometimes even operating for 24 hours. This significantly adds to gas and electric bills, and increases the industry's carbon footprints. Commercial kitchen appliances such as freezers, fryers, ice-machines, and griddles are rated by the US Environmental Protection Agency (EPA), and products that have earned the energy star rating are more sustainable than conventional alternatives. However, with IoT systems and applications, energy management is convenient and it presents opportunities for cost control. Temperature sensors for commercial kitchen equipment and systems can now monitor and record temperature in real time, no matter the location. Machine tracking applications can check equipment status, run diagnostics, and monitor equipment to help troubleshoot problems and to prevent problems from arising. Cloud-based applications provide an array of services that present operators with unprecedented benefits. Connected lighting systems can be controlled remotely and features such as daylight harvesting yield more energy savings for QSRs. HVAC systems, an essential QSR technology, can send unit alarms and component failure alarms, log run-times, and control temperature and other settings remotely. Smart electric meters can provide logs on peak demand times, which can be further detailed through graphical charts. Similarly, connected water meters can produce logs on peak draw periods and gallons per hour (GPH) flow, report on water filter status, and alert on water closet room temperature. The productivity captured from these systems contribute to the savings but is a difficult metric to quantify, however, energy data analytics platforms help substantiate business outcomes from improved energy management efforts.

5.2 Food cost reduction

Investing in digital technology will not only enhance overall customer experience, but it will also contribute to the overall margin through various cost control measures. Refrigerators and freezers are an integral part of any QSR kitchen. Through wireless temperature sensors, real-time data can be collected on product and coil temperatures, fan and compressor status, and opened door status. This data is useful to prevent food spoilage and keep inventory in control. Surveillance technology such as closed-circuit television (CCTV) is a standard at QSRs. The foodservice industry operates on tight margins, and Internet Protocol (IP) surveillance systems help secure those margins by identifying food wastage, shrinkage from theft and guarding against robberies or lawsuits. The IP technology provides operators with remote access to live streaming or recorded footage of multiple locations via mobile devices from virtually anywhere. By leveraging analytics tied to these surveillance

¹ 5 ways QSRs can reduce energy costs. (2009, December 27). Retrieved May 26, 2017, from <https://www.qsrweb.com/articles/5-ways-qsr-can-reduce-energy-costs/>

systems, operators can improve their sales by monitoring employee performance, track targeted market campaigns, and ultimately contribute to margins.

5.3 Equipment maintenance management

Technology innovations allow for the remote monitoring of equipment with real-time information, hence increasing visibility. This monitoring allows for preventive maintenance and minimized service calls. Platforms with cellular capabilities using connected controls and sensors for commercial kitchens can now provide dependable and accurate data, ensuring customer comfort, energy and operational efficiency, food safety and compliance. Similarly, other equipment in QSRs such as soda dispensers, espresso machines, and ice cream machines can now diagnose technical issues, send alerts, offer troubleshooting steps, or even dispatch service technicians. Sensors connected to the database offer real-time data on equipment usage, issues, and quick fix options. The operator can be made aware of problems in advance, even before the technician is alerted. This proactive approach allows for the seamless operation of equipment and alleviates the stress and headache of having equipment breakdowns during peak operating hours. While these technology systems may take time to proliferate across verticals in the market, the trend of using subscription-based equipment drives the adoption of these technologies. Subscription services allow restaurant operators to leverage the integration of technology and gain operational insights through data analytics without the large capital expenditures of the past.

5.4 Enhanced brand equity

In today's age of social media, QSRs constantly engage with customers to inform them about new additions to the menu, promotions, and other corporate initiatives. Today's customers, Millennials and Gen Zers, are informed, tech-savvy, and are accustomed to on-demand services. Social media engages and connects these customers, creates brand awareness, and attracts new customers. Staying atop technology trends keeps the brand relevant, and, more importantly, creates an overall positive experience at the restaurant that will enhance brand equity. Order ahead apps can provide accuracy and customer convenience, while self-order kiosks and digital menu boards offer streamlined methods of food ordering that cut down on wait lines. Mobile payment options and eWallets aid the speed, efficiency, and flexibility of payments, which improves customer satisfaction. Digital technology also provides an opportunity for operators to be transparent about where their food is sourced and how it is prepared — information that appeals to today's customers. Beyond trending technologies, QSRs can further add integrated IoT systems and applications that enhance the customer experience. Building automation and IoT technology can provide customers with personalized experience with lighting and thermal comfort via smart sensors. These sensors can track the weather and the number of patrons dining in the restaurant and subsequently adjust the lighting and the room temperature. This elevated experience can contribute to building brand equity and foster brand loyalty.

5.5 Compliance to HACCP regulations

Temperature-sensitive inventory is highly susceptible to damage from refrigeration malfunctions or power interruptions. Automated and reliable systems can remotely monitor temperature, aid accuracy, increase efficiency, and ensure compliance. Real-time sensor data over IP or cellular networks can be viewed on mobile devices and other devices through a cloud server for analysis, reporting, and control. This data is continuously recorded on the cloud server and offers preventive measures for maintenance. Cloud-based automated data systems can eliminate errors from manual readings and recordings, ensure time-stamped and accurate data is collected, and offer peace-of-mind regarding compliance to HACCP-mandated regulations on food safety.

6. CASE STUDIES

6.1 Single analytics platform

Managing technology systems and getting data quickly is a challenge in itself, but is made even more difficult when it involves multiple operations across the country. Maintenance operations, contractor management, and cost control can become consequential issues for QSR chains. For a large national brand operating over 300 restaurants in 35 states, these issues were paramount.

Due to lack of visibility, it became difficult to know what maintenance measures were needed at their diversified locations. Moreover, the absence of real-time data inhibited the timely management of repair and maintenance work orders, and the responsiveness to emergency issues. Substandard operational visibility also led to difficulties in tracking and managing costs and other key performance indicators (KPIs). Maintaining a pre-defined cost level, reducing invoice and processing costs, and gaining insights into total spend or category spend were a challenge. Limited visibility also impeded sourcing quality repair and maintenance contractors that met the company requirements in underserved regions of their operation.

Sensing the shortcomings of their current technology systems, the company consulted with an industry IT partner and implemented a software as a service (SaaS) system. The integrated platform was accessed through a single dashboard and provided the following solution. A contractor directory enabled finding and qualifying industry-proven contractors for all trades across the country. A separate application enabled creating and monitoring work orders to better manage critical issues in real time. A new level of analytics and business intelligence meant to drive down costs and meet KPI goals was delivered through an analytics reporting module. Maintenance was tracked separately in an application that boosted visibility into all required services and warranty obligations.

This integrated solution provided the company with unprecedented visibility and significant cost control. Operators were now able to track unfinished repairs that were keeping restaurants from operating as designed, and long-standing work orders were eliminated. Facility managers could manage KPIs, such as average invoice amounts and on-time arrival compliance, and the company began using metric-driven NTE (not to exceed) controls to cut costs significantly. Insights into the average invoice cost per specific trade and repair type enabled the company to reduce its NTE amount each month. Over a one-year period, the company reduced its average invoice cost by 11.8 percent and saved over \$1.7 million. Contractor management also improved significantly. The company was able to quickly expand their contractor base by 25 percent and improve vendor depth per trade by onboarding over 280 contractors in less than 90 days. Contractor relations were enhanced improving accounts payable, and work orders that were typically open for more than 365 days were reduced to 60 days in less than a month. The company realized return on investment (ROI) after the implementation of the software in less than two months.

Using the single platform system, this national QSR company was able to operate more cost-effectively, establish measureable KPIs, and manage its pool of contractors more efficiently.

6.2 Streamlined networking

Incorporating new digital technology into operations can increase efficiency and increase business visibility. However, adding another platform to an already complex web of technology systems can make management a real challenge. Traditionally, cabling is used to run a hard-wired network to manage digital signage, POS systems, and other add-ons such as self-order kiosks. It is a costly task that requires lengthy installation time, and for some older buildings, it simply may not be possible. 4G Long-Term Evolution (LTE), a wireless communication system of high-speed data for mobile phones and data terminals, offers constant and flexible connectivity by reducing barriers of speed-to-deployment, agility, cost, and performance. Cloud-based networks utilized through 4G LTE deliver security, reliability, and performance that QSRs need. Cloud management makes consistency viable across an entire brand.

Some QSRs require higher bandwidth solutions. For example, many menus are not active content, with prices and offerings pushed to a restaurant from a central location. Some businesses also push client entertainment to individual restaurants from a central content distribution network (CDN). In these cases, a high-speed broadband connection is necessary. Recent developments in the broadband industry have greatly reduced the cost of connections and have even enabled gigabit capacity at low rates. QSRs can acquire these connections and add security through software defined wide area networking (SD-WAN) solutions. This combination of high-speed connectivity and security enables individual locations to support both their in-building applications and connections back to headquarters or CDNs.

A rapidly growing QSR, with locations in more than 15 states, was looking to solve a number of critical technology challenges. Namely, its network connectivity solution was not performing optimally and the organization wanted to implement wireless wide-area network (WWAN) at each location. Testing out different solutions, the company soon realized that the implementation involved working with more than one vendor. They partnered with a 4G LTE networking solutions provider that offered devices and a platform that enabled the chain to centrally configure, monitor, and manage the company's network.

Prior to the installation of the new device and cloud management solution, the company had to rely on a dial-up phone system as a back-up solution in case of the loss of network access. This arrangement was very slow, did not meet the standard for credit-card processing, and was very expensive. The new technology solution installation solved these issues, enabling the company to eliminate two phone lines at each location. The new streamlined process also reduced costs on a month-to-month basis. The company was able to break-even on cost within 24 months of installation, and saw a full return on investment in a short period of time.

6.3 Benefits beyond LEED certification

For large national QSR chains that have been in operation for many years, it is imperative to rebuild and retrofit the buildings they operate in. A global leading chain chose to rebuild one of their locations to Leadership in Energy and Environment Design (LEED) Gold standards by incorporating eco-friendly and energy-efficient features. The five categories for satisfying LEED-specific green building criteria include sustainable sites, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality.

The company worked with a global control networking solutions provider to leverage a single platform for multiple applications in the kitchen and building segments, which targeted lowering energy-related costs while increasing operational efficiency. They started with an open, interoperable platform that used the same infrastructure and hardware needed to operate both the building and kitchen applications. This approach

allowed for equipment to be moved around within the premises and still provide reliable communications by plugging into a power source. Other components and features integrated to the system were HVAC control for all zones, on/off control for all exterior lighting, and metering/monitoring of the electrical mains and the solar hot water system. These functions were displayed and controlled through an easy-to-use touchscreen dashboard.

With additional green features installed, the new energy-efficient restaurant went on to earn their LEED Gold certification, a noteworthy achievement for the company. The versatile platform installed offered other benefits with which cost control and increased efficiency were realized. The real-time information provided by the equipment facilitated close monitoring of food waste, subsequently improving inventory management, reduced equipment downtime through usage-based preventive maintenance rather than fixed schedules. The data also allowed operators to receive preventive notifications and alerts on equipment problems, ensured reliable food safety reporting by automated reporting of food and freezer temperature, and provided equipment and asset tracking in the store or between stores.

6.4 Energy management and growth

A leading national chain restaurant had aggressive plans to expand its operations across the United States and to meet that goal, they needed control over rising energy costs and visibility into facility equipment. Mindful of the importance of having a simple integrated system for reporting and visibility, they partnered with an energy management solutions provider.

On their mission to manage their energy cost, the company discovered a series of unseen issues that were increasing their energy costs at an alarming rate. For example, HVAC units had no setback function and would run throughout the night and several rooftop units were not functioning to their optimal level. Furthermore, employees would negligently turn on or leave on equipment on during non-peak hours, adding to the costs. The company installed HVAC controls, branch energy monitoring, and lighting controls that fed data into a cloud-based management application, which facility managers could access on-site or remotely via mobile devices. Lighting loads were connected to lighting controls to automate their schedules and energy usage impacts of lighting used inappropriately during off-hours were tracked. Additionally, management could compare sub-load level energy costs per square foot with other restaurants, ensuring optimal energy utilization.

Over the course of a year, the growing national chain achieved six percent in energy savings in each facility with a 10 percent savings in HVAC energy usage. Additional benefits of the installation included reduced HVAC downtime, enhanced visibility into equipment and operations, and the ability to audit vendor compliance.

7. CALL TO ACTION

The QSR industry needs to more quickly adopt and integrate IT systems and applications to fully leverage the benefits of IoT. Despite the challenges of managing IoT systems in a fragmented state, QSR organizations that identify their strategic needs and develop an intelligent implementation plan stand to benefit in a number of ways. These include increased efficiency, visibility in maintenance, and cost control.

Clear priorities also help QSR organizations navigate a fragmented vendor landscape and focus on the industry partners that can deliver the greatest returns in terms of energy savings, food cost reduction, equipment

maintenance management, and brand equity. QSR organizations enjoy access to a range of solutions and, as evidenced through case studies, have achieved strong results in reducing costs, increasing energy savings, and optimizing analytics. These strong results are crucial to ensuring QSRs stay competitive in an increasingly competitive industry, and they can do so without harming a QSR's bottom line. While there are good examples of QSR industry evolution towards IoT, there is still much further to go for this industry that often avoids the risk of being a technology testing ground. Considering the current state of the industry, however, it is imperative QSR organizations move faster in adoption of intelligent building advancements to ensure sustainable operations for the future.

REFERENCES

¹ Tucci, C. (2014, October 09). Topic: Fast food industry-Statistics & Facts. Retrieved May 26, 2017, from <https://www.statista.com/topics/863/fast-food/>

² State Minimum Wages | 2017 Minimum Wage by State. (2017, January 01). Retrieved May 26, 2017, from <http://www.ncsl.org/research/labor-and-employment/state-minimum-wage-chart.aspx>

³ 5 ways QSRs can reduce energy costs. (2009, December 27). Retrieved May 26, 2017, from <https://www.qsrweb.com/articles/5-ways-qsr-can-reduce-energy-costs/>

GLOSSARY

Big Data: Big Data is an evolving term that describes any voluminous amount of structured, semi structured, and unstructured data that has the potential to be mined for information.

Bottom Line: Bottom line refers to a company's net earnings, net income or earnings per share.

Business intelligence (BI): Business intelligence is a technology-driven process for analyzing data and presenting actionable information to help corporate executives, business managers and other end-users make more informed business decisions.

CCTV: Closed-circuit television, also known as video surveillance, is the use of video cameras to transmit a signal to a specific place, on a limited set of monitors.

Cloud-based data analytics/application: Cloud-based is a term that refers to applications, services or resources made available to users on demand via the internet from shared server.

Cloud server: A cloud server is a shared section of a server. It allocated for personal use via virtual environment and controlled by the service or cloud provider.

Content distribution network (CDN): A content distribution network is a system of distributed servers (network) that deliver webpages and other Web content to a user based on the geographic locations of the user, the origin of the webpage and a content delivery server.

Data Interoperability: Data interoperability is the ability of different information technology systems and software applications to communicate, exchange data, and use the information that has been exchanged.

End-to-end: End-to-end is a design framework in computer networking. In these type of systems, application-specific features reside in the communicating end nodes of the network, rather than in intermediary nodes, such as gateways and routers, that exist to establish the network.

Energy star rating: Energy star is a U.S. Environmental Protection Agency voluntary program that helps businesses and individuals save money and protect our climate through superior energy efficiency.

E-Wallet: Electronic wallet refers to an electronic, internet based payment system which stores financial value as well as personal identity related information. Such electronic payment systems enable a customer to pay online for the goods and services, including transferring funds to others, by using an integrated hardware and software system.

FDA: The Food and Drug Administration is a federal agency of the United States Department of Health and Human Services. The FDA is responsible for protecting and promoting public health through the control and supervision of food safety, tobacco products, dietary supplements, prescription and over-the-counter pharmaceutical drugs, vaccines, biopharmaceuticals, blood transfusions, medical devices, electromagnetic radiation emitting devices, cosmetics, animal foods & feed and veterinary products.

Gen Z: Also known as post-millennials, Generation Z is the demographic cohort after the millennials. Demographers and researchers typically use starting birth years ranging from the mid-1990s to early 2000s. A significant aspect of this generation is the widespread usage of the Internet from a young age.

GPH: Gallons per hour measures how much water the pump will move around each hour without being pumped to any elevation.

HACCP: Hazard analysis and critical control points or HACCP is a systematic preventive approach to food safety from biological, chemical, and physical hazards in production processes that can cause the finished product to be unsafe, and designs measurements to reduce these risks to a safe level.

Internet of Things (IoT): The interconnection via the Internet of computing devices embedded in everyday objects, enabling them to send and receive data.

IP surveillance: An Internet protocol camera, or IP camera, is a type of digital video camera commonly employed for surveillance, and which, unlike analog closed circuit television cameras, can send and receive data via a computer network and the internet.

KPI: Key Performance Indicators are a set of quantifiable measures that a company uses to gauge its performance over time. These metrics are used to determine a company's progress in achieving its strategic and operational goals, and also to compare a company's finances and performance against other businesses within its industry.

LEED: Leadership in Energy and Environmental Design is a rating system devised by the United States Green Building Council to evaluate the environmental performance of a building and encourage market transformation towards sustainable design.

LTE: Long Term Evolution is the project name given to development of a high performance air interface for cellular mobile communication systems. It is the last step toward the 4th generation (4G) of radio technologies designed to increase the capacity and speed of mobile telephone networks. While the former generation of mobile telecommunication networks are collectively known as 2G or 3G, LTE is marketed as 4G.

Millennial: Millennials are the demographic cohort following generation X. Demographers and researchers typically use the early 1980s as starting birth years and mid-1990s as ending birth years.

Point of sale (POS): POS terminal is a computerized replacement for a cash register. The system can include the ability to record and track customer orders, process credit and debit cards, connect to other systems in a network, and manage inventory. It frequently comes with an integrated accounting module; it is an all-in-one way to keep track of business's cash flow.

QSR: A quick service restaurant is a specific type of restaurant that serves fast food cuisine and has minimal table service.

Real-time data: Real-time data is information that is delivered immediately after collection. There is no delay in the timeliness of the information provided.

ROI: A performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. It measures the amount of return on an investment relative to the investment's cost.

SaaS system: Software as a Service is a software licensing and delivery model in which software is licensed to a user. The software, or application is accessed via the internet and a web browser. You do not need to install and maintain the software. The application runs on the SaaS provider's servers. The third-party provider then is responsible for the security, performance, and maintenance of the application on their servers.

SD-WAN: Software-Defined Wide Area Networking is a transformational approach to simplify branch office networking and assure optimal application performance. Unlike traditional WANs, SD-WAN delivers increased network agility and cost reduction.

Subscription-based equipment: The subscription business model is a business model where a customer must pay a subscription price to have access to a product or service. With equipment it includes features such as preventive maintenance and warranty maintenance services. Additionally, the provider is responsible for equipment's failure to perform. The provider will make the repair at no additional cost to the operator.

System integrator: A systems integrator is an individual or business that builds computing systems for clients by combining hardware and software products from multiple vendors.

US EPA: The United States Environmental Protection Agency is an agency of the federal government of the United States which was created for the purpose of protecting human health and the environment by writing and enforcing regulations based on laws passed by congress.

WWAN: A wireless wide area network, is a form of wireless network. The larger size of a wide area network compared to a local area network requires differences in technology. Wireless networks of different sizes deliver data in the form of telephone calls, web pages, and streaming video.



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