

Jumping Into The FOG

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The Internet of Things provides insight into restaurant FOG accumulation

The Internet of Things (IoT) is an inescapable megatrend that will touch almost everything, even the lowly grease interceptor.

Megatrends are large, transformative global forces that impact everyone on the planet. Most intellectuals who put together lists of megatrends have identified the IoT as one of these transformative global forces.

The IoT Revolution

As the name implies, the IoT revolution is all about connecting everyday things to the internet, allowing them to send and receive data. The IoT is revolutionary because of the number of new connected devices and the speed at which the number of connected devices is growing. Companies like Cisco and Intel are estimating that the number of connected devices worldwide will rise from 15 billion today to between 50 and 200 billion by 2020. We are in the process of internet-enabling our bodies, homes, cars, utilities, industries and restaurants.

IoT connected devices are not just for convenience. They are the competitive tool of a generation. Companies that embrace connected devices to measure and manage their major cost inputs, such as power, water, labor and natural gas, will have distinct competitive advantages. Those companies that do not embrace technology will be the high-cost suppliers and may be left behind.

High-Tech Restaurants

In the restaurant industry, customers are now familiar with the IoT's influence in the dining room, from self-ordering on tablets to paying for food, right at the table. It offers them the speed and convenience they crave, while the restaurant improves operational efficiencies and increases table turnover and sales.

Today's eating establishments are good examples of how the IoT is creating a positive impact on an industry. Connected sensors and networked intelligence are making a difference behind the scenes in mechanical and electrical systems. Restaurant equipment that includes commercial ovens, refrigerators, freezers, HVAC systems, lighting, signage, thermostats and irrigation systems is now being shipped with integrated wireless capabilities. These devices can send real-time data such as status, temperature, moisture levels or fault codes back to the manufacturer for technical support and maintenance purposes. They can even be controlled remotely.

Recognizing the potential for efficiency and productivity gains, several innovative software companies have developed cloud-based tools that collect, monitor and analyze information from all of these different restaurant systems and display it on a unified dashboard. From a desktop or smart phone, restaurant facility managers

can view and manage critical systems for a single store location or for hundreds of locations across a region. This IoT application is allowing restaurants to maximize the lifespans of assets, reduce energy and operational costs, and improve food safety.

For example, a recent edition of *The Dish* featured an article that explained how Arby's Restaurant Group was able to collect enterprise level power consumption data and then take steps to reduce power consumption by more than 15 percent and water consumption by more than 8 percent in its company-owned restaurants.

Putting the IoT into FOG

Recently, the restaurant's wastewater system has also become a suitable candidate for centralized cloud facility management. The cleaning and rinsing of restaurant cooking equipment and flatware produces a mixture of fats, oils and greases (FOG) and solids that are collected in the restaurant's grease interceptor. Grease interceptors require servicing when the FOG and solids levels accumulate to a predetermined maximum limit.

Servicing the interceptor too frequently is a cost inefficiency. Not servicing the interceptor frequently enough causes grease blockages. This leads to several catastrophic results, including overflows and backups of raw sewage into the restaurant, causing restaurant closures and brand damage, as well as regulatory fines and plumbing costs.

The key to balancing between wasting money on frequent servicing and allowing FOG catastrophes is to know exactly when the interceptor's FOG and solids levels hit the maximum allowed limit.

Historically, FOG and solids levels were measured manually by restaurant staff, using a dip stick or "sludge judge." This manual measurement is usually inaccurate and is not the best use of cook staff time and energy. Recently, manufacturers have developed ultrasonic sensors that accurately measure the levels of FOG and solids in an interceptor and wireless transmit the level data to a touchscreen controller inside the restaurant so that level data is available at any time.

Using the touchscreen controller, level data can be sent to the cloud through local Ethernet, Wi-Fi or cellular connections and loaded into a GIS database application. The database application provides facility managers with level data and history from all restaurants in a region and can push alarms and warnings to the mobile devices of facility managers, local restaurant managers and service providers. The FOG sensor data can be managed as a stand-alone platform, or the sensor can be incorporated into a whole-restaurant or enterprise-level data collections and analytics platform.

The Bigger Picture

Connected FOG sensors can be part of a much larger FOG management program, in which all of the stakeholders in the FOG ecosystem—including restaurants, service providers and municipalities— have access to the grease interceptor level data. In an ideal FOG ecosystem:

- Restaurants enjoy reduced service costs and eliminate catastrophic FOG events.

- Service companies become more efficient in collection routing, waste processing and waste disposal.
- Municipalities enjoy reduced sewer blockages, reduced enforcement costs and access to a FOG resource to use as feedstock to anaerobic digesters that produce green energy.

It's a win-win-win scenario—all due to the addition of smart-meter technology.

Rob Abernethy has more than 30 years of experience in the environmental, water and wastewater industries. His past senior management roles include General Manager of American Carbon Services, President of MS Filter and Managing Director of Green Turtle Technologies. Abernethy is currently serving as Managing Director of Ecoinsight Instruments, a start-up company that will provide smart-meter technology to the water and wastewater market. His focus has been commercialization of innovative water and wastewater treatment technology companies.