Making IoT useful for Fueling and Convenience Retail
Can the Web of Things Help?
By: David Ezell, Conexxus

Motivation

Fueling and Convenience retail is where merchants meet customers. In the United States alone, convenience stores serve 165 million on-site customers every day. In 2018, these transactions added up to over $654 billion dollars spread over nearly 154,000 store locations.

But Fueling and Convenience Retail is also where merchants meet machines. Convenience stores rely heavily upon a labor force with no specifically defined skills. It's important to realize that these employees are not necessarily "unskilled" as people often use the term. These employees are students, retirees, those newly divorced, and those forced to relocate, etc. Because it's impossible to rely on any specific skill set, stores must instead rely heavily on automation to control product delivery, to control cash and payments, to evaluate inventory, to monitor the store environment for safety and comfort, to monitor the function of key equipment to provide proactive provisioning and maintenance (zero downtime), and of course to serve customers. Some of these automated tasks require software with strong User Experience (UX) features, but increasingly strong Customer Experience (CX) features are required and expected: we are on the cusp of "bring your own device" to an Augmented Reality checkout experience. All of these devices, store and customer owned, are crucial to the automation environment of the store. And all of this equipment – at least newer equipment – is IoT enabled.

But that's not the end of the automation story. AI Robotic Process Automation (RPA) stands ready to replace people with yet more equipment to perform repetitive tasks. Electric Vehicles (EVs) and Automated Vehicles (AVs), in combination with "order ahead" capabilities will completely and permanently change customer traffic patterns, and provide still more opportunities for humans to interact with IoT enabled equipment.

The people in the industry – executives, managers, contributors, and associates – are highly skilled in customer service, supply chain logistics, vendor relationships, construction planning, and many other operational aspects of their business. Yet, in spite of the pressure to automate, Information technology lags in the convenience industry – until now.

Operators must manage many valuable resources in their store operations – real estate (location is supremely important for convenience), equipment (safety is a huge concern), fuel inventories, and in-store stocks. But only recently has it become clear to operators that for their success, their *data* may be the most valuable resource. But unfortunately, when it comes to IoT, the technology deployed has developed with manufacturers' interests far ahead of the merchants' need for systems integration.

Conexxus Mission in the Industry

The fuel and convenience retailing technology group, now known as Conexxus, was founded in October of 2003. As an independent and non-profit entity, Conexxus's mission is to set *standards for data exchange*, provide clarity on emerging technical trends, to improve profitability, and to advocate for the industry.

In this setting, standards improve the ability of operators to select or replace IT devices based on performance and cost. In contrast, while IoT provides many new opportunities for feature and performance management, it is typically relatively "sticky" and *can actually increase the costs for an operator who must either replace or integrate systems*.

Current Standards

Following are a few of the standards that have been developed and are currently in wide use in the industry:

- Electronic Payment Server and Forecourt Device Controller have helped decouple payments and fuel operations from the POS systems that need them.
- The Loyalty and Mobile Payments interfaces have opened many profitable opportunities for merchants.
- POS / Back Office has helped standardize store system configuration and reporting.

Only recently, Conexxus has been working to develop a clear "API" strategy for the already developed semantic content, with the overarching goal being, to borrow a term from Alibaba, to "datafy" every customer exchange.

Developing this API strategy produced a clearer picture of the importance of IoT as a data source, along with the difficulties associated with integrating this data into the API Ecosystem.

Technology Drivers

The technology drivers in fuel and convenience retail have changed a lot over the past few years. Examples of this change include the exponential growth of data (both volume and importance), and completely different benchmarks to measure success or failure. Perhaps the most important development is the rise of the digital consumer.

Once confined to the online world of the Web, digital consumers now demand a seamless, frictionless, shopping experience – the division between the Web and Brick-and-Mortar commerce is now clearly the merchants' problem. The behavior of digital consumers is defined by "what I want, when and where I want it, and on my terms."

Addressing this evolving view of consumer service requires a swarm of devices dedicated to providing connectivity and servicing consumer needs at every turn. Managing those devices requires IoT, and we hope that the Web of Things will help make IoT integrations cost effective.

5 Year Outlook

For fuel and convenience retail, we predict the following:

- **Baseline** – standard POS systems that support payments and report through back office systems to headquarters are the basic configuration.
- **Now** – cloud-based loyalty systems provide access to promotions and alternative payments. These "walled-garden" systems will be limited in their consumer reach.
- **1 to 5 years** – improved store security and mobile checkout (BYOD) will become prevalent. Data analytics and cloud based AI systems will focus on knowing consumers. *Device management through IoT becomes crucial*. AI based (scannerless) checkout will become widespread.
- **3 to 7 years** – a slew of new capabilities linked to IoT tracking of resources, media (software), and consumer devices will emerge, and robotic process automation will take center stage.
- **5+ years** – store personnel and consumers will access new UX/CX innovations through augmented reality. Distributed digital ledger "validation" and "provenance" technologies will become widespread, and automated vehicles will be both serviced and used by store operations.

Obviously, it's hard to predict exactly when these new developments will occur, but there's little doubt that they will occur soon.
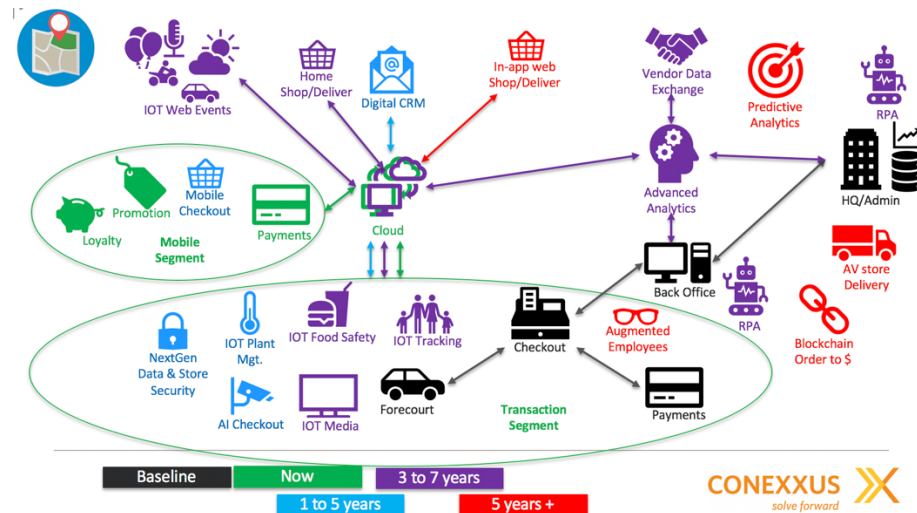
Summary

Creating IoT standards useful to merchants in managing their technology estate has been an elusive goal in fuel and convenience retailing. Technology vendors are inclined to make their products "sticky," and not nearly as interested in the interoperability of those products at the IoT level. The Web of Things seems to be emerging as a technology where Conexxus can engage in creating and adopting standards that will be of benefit to our members, as well as to our industry. WoT could be a game changer in "datafying" fuel and convience operations.