



Dawn of Digital: New-Age  
Technologies to Usher in an  
Era of Smart Gas Stations



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In the last two decades, gas stations have been through a step change in terms of site formats, forecourt operations, product and service offering. The traditional fuel retail industry has been changing fast and formats like hyper, big box and convenience are adopting new technologies in stores and forecourts for more personalized engagements, delightful fueling and shopping experiences. A global trade body that caters to the fuel retailing industry says more than 85% of gasoline sold in the US is now at self-service gas stations, most of them with touch-screen devices and mobile apps.

The fuel mix itself is undergoing dramatic changes as electricity and hydrogen-powered vehicles take to the streets. With divergent

formats, new products and services, a plethora of partners, increasing competition, growing regulatory requirements and changing consumer behavior, petroleum retailers need to redesign and transform their forecourt operations to keep up with the changes.

The advent of robotic fueling, mobile applications, contactless devices, drones for doorstep fuel delivery, numerous other customer assistive technologies such as virtual retail assistant, AR/VR devices, omni-commerce POS, the traditional fuel retailing industry and gas station forecourts are gearing up for a big revolution powered with digital technologies. There is a need for fuel retailers to be aggressive and early adopters of digital transformation to ensure service delivery excellence.



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## Trends shaping the future

While changing customer behavior, especially driven by the digital natives, will continue to usher in transformations, there are four radical trends re-casting the future of fuel retail: zero-emission vehicles, connected vehicles, autonomous vehicles and, pump technology and station formats. These trends indicate how gas stations will evolve and how they will operate over the course of the next decade. The broad implications of these trends need to be appreciated to understand their technological impact on operations.

**Zero-emission vehicles (ZEV):** The proliferation of electric, solar, hydrogen and hybrid vehicles on the back of subsidies, tax incentives and strong emission norms will mean a change in gas station infrastructure with hydrogen dispensers and recharge points. According to a global energy and environment consortium, by 2020 about 10% of the cars on the street will not need the type of oil change and other services that gas-based vehicles need. While the design of the gas station will not change dramatically, the type of partners required to provide products and services for a new breed of vehicles will increase.

**Connected vehicles:** Connected vehicles will substantially alter the way gas stations – if at all they are called gas stations a decade from now – interact with motorists. A majority of the interaction will shift to an omni channel mode with gas stations sending real-time offers,

ensuring personalized promotions and automatic responses to maintenance signals from vehicles. Today, connected cars are an innovation in the automobile industry. But soon, their high-tech owners will force an equal amount of innovation from the industry that supports the day-to-day non-fuel services of their vehicles. This is clearly a sophisticated digital play with the Internet of Things (IoT), data and analytics in the making.

**Autonomous vehicles:** Self driving vehicles are emerging from their nascent stage. Every major manufacturer has a self-driving model ready to be rolled out of their R&D facilities. These vehicles will feature a number of software components and applications that will be delivered in the form of subscriptions or aftermarket systems. While it is difficult to guess exactly which features will find favor first, they will include enhanced navigation, safety, fuel-efficiency and remote maintenance, dynamic pay-as-you-drive insurance and integration with a variety of devices and advanced driver assistance systems with natural language interfaces.

**Pump technologies and station formats:** While automated pumps and mobile apps will quickly find widespread adoption, we will see mobile fuel delivery become a reality – especially when the fuel itself becomes simpler to transport (such as re-charged batteries and CNG). Users may not have to

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## Leading with disruption in forecourt services

queue up at a gas station. Instead, they could request for re-fueling at a point of their choice. Even at the traditional fuel pump, robotic arms may automatically connect to and refuel vehicles and allow motorists to automatically pay using a mobile app even after they have left the gas station (exactly the way you pay for a taxi hailing service).

These innovations will call for a major deployment of digital technology. Today, a typical gas

station has a very small component of its operations that are digital.

The biggest challenge for gas stations will be integrating partners and providers to seamlessly honor loyalty programs, create multi-brand offers and provide contactless payment. Many gas stations could add cross-category services such as gaming, leisure and entertainment, and even offer their location as a convenient pick-up point for online retail orders.

Fuel retailers need to redefine their forecourt operations to fulfill customer expectations across fleet, retail loyalty or across non-loyalty categories by adaptive product offerings, innovative value proposition, dynamic personalized engagement and swift service delivery. In reality, smart fuel retailers can be extremely disruptive by looking at their forecourt operations through the lens of digitalization and innovative partnerships. The new services will add to revenue streams, which are becoming extremely critical in the face of falling margins in existing traditional business models.

Gas stations, as we know them, could soon become irrelevant, given the imminent changes in the automotive industry. They need to leverage technology - mobility, social, IoT, data, analytics, machine learning, Cloud, social, automation and robotics - to fulfill customer expectations in an ever changing and challenging environment. The advantages of going digital are undeniable (see Figure 1), with the key digitalization levers and technology options for major functional areas and their implications on retail forecourt operations.

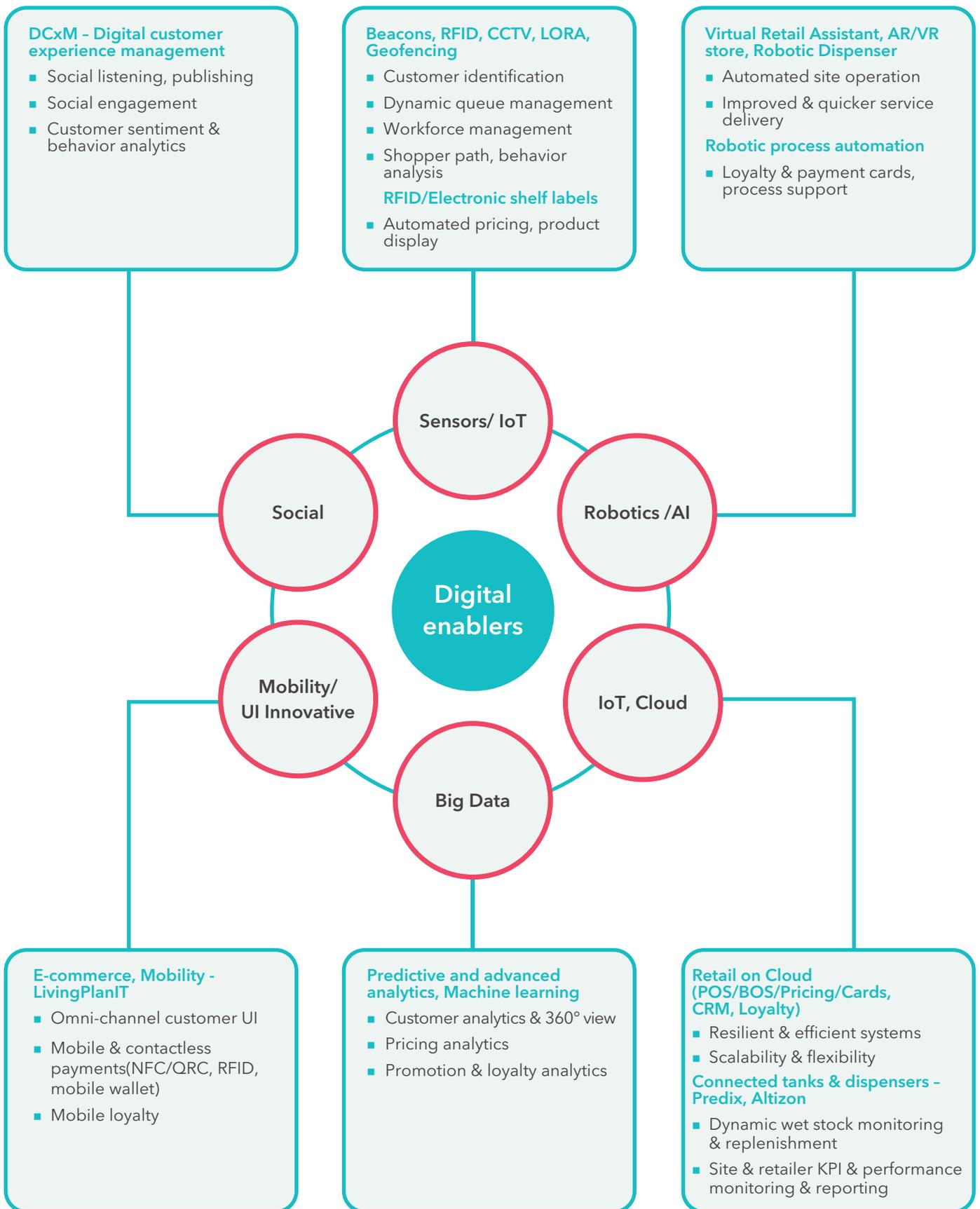


Figure 1: Technology mix for smart gas stations

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Today's retail consumers are becoming more demanding. They are also more empowered with the availability of information and data that guides their buying decisions (best price, best buys, offers, bundles, etc.). Gas stations need to adapt to the new research-and-buy process so that they can retain and grow their share of wallet as the industry undergoes radical changes.

High performing retailers must take advantage of the changing fuel retail environment as an opportunity for market growth by disrupting their forecourts with new digital

technologies and a focus on customer, brand and bottom line.

**The key to success of smart gas stations lies in:**

- Turning it into an "integrated energy and services hub" with shifting fuel mix
- Addressing the expectations and preferences of connected customers,
- Offering superior brand experience by reinventing the forecourt as a desired destination for the customer



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## About the author

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