



2023 Industry Innovators Report

Featuring inputs from
executive attendees
at the 2022 PDI Industry
Innovators Summit

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Forward

Innovation at PDI

As you have probably gathered by now, innovation is important to PDI. Whether that's creating new products or implementing improvements in existing products, we always strive to better serve our customers.

We believe that when data drives, business thrives. We're eager to connect our customers with the technology and data that will enable them to excel. While innovation happens at every corner of PDI, this report focuses on innovations that create a "better together" experience for our customers.

PDI has grown to become a global organization supporting top retailers, petroleum wholesalers, CPG manufacturers, carriers and haulers, consumer brands, restaurants, and other businesses. Our growth has not only been organic but has also been fueled by strategically acquiring technology leaders that provide value to our customer base. While we believe it's important to offer best-in-class solutions, the real value is offering solutions that work "better together" under one common Industry Cloud Platform connected by what we call PDI Web Services.



Vlad Collak
VP, Innovation & Web Services

Content

- » **The Current State of Industry Innovation**
 1. Changes in the Macroeconomic Environment
 2. Shifting Consumer Shopping Behaviors
 3. Cloud, AI, and Cybersecurity
 4. Digital Transformation of Operations
- » **Innovation Happening at PDI**





The Current State of Innovation

The convenience store industry is undergoing a major digital transformation to meet changing consumer expectations and evolving macro trends. Retailers, petroleum wholesalers, CPG manufacturers, and other industry participants are rightfully focused on innovations and investments that create impactful user experiences, improve offerings, and fuel bottom-line growth.

This report examines the state of innovation today and the vision for tomorrow. We'll discuss challenges and opportunities to transform from within and with one another. We'll share ideas and potential solutions—and we'll dig deeper into disruptions in the c-store space and beyond.

What We Heard from PDI Customers

During the recent PDI Industry Innovators Summit, we gathered feedback from leaders representing top retailers and petroleum wholesalers, including digital officers, IT executives, operations personnel, finance leaders, and innovation officers. They discussed the various challenges they face, but also the opportunities on the horizon.

Some of the top focus areas for these leaders are:

- » Customer engagement and loyalty
- » Operational efficiency
- » Foodservice
- » Shifting consumer preferences (EV, frictionless checkout, etc.)
- » Labor shortages
- » Supply chains
- » Cybersecurity

Among the key pain points these organizations face are challenges in staffing and training, as well as inefficiency and manual processes that only exacerbate the labor shortages. Likewise, the lack of one version of the “truth” across a multitude of IT systems is often a concern, as is the high degree of complexity, especially around site-level systems.

There was a palpable amount of frustration with some of the existing retail systems that have been slow to change, as well as slow to modernize and innovate. What's worse, the complexity of the c-store environment is completely lost on consumers who are already experiencing much more innovation in other retail and restaurant sectors and therefore expect the same level of innovation in the convenience space. To some retailers, this status quo seems like a technological arms race with other industries where everyone is striving to deliver more convenience and a greater customer experience.



Luckily, these challenges are solvable and most participants agreed on the list of solutions to address them:

- » **A good data strategy with a single source of truth across IT systems**
- » **A better customer experience informed by data and insights**
- » **Better store-level operational metrics**
- » **Reduced IT complexity**
- » **Heightened industry focus on innovation**

When asked about innovations that are readily available in adjacent industries, most participants pointed to workflow automation in restaurants and manufacturing, self-checkout and frictionless checkout, as well as automation using AI—especially in the logistics space.

While there are many trends that affect our customers, PDI has identified four that are worth exploring more:

- 1** Changes in the macroeconomic environment
- 2** Shifting consumer shopping behaviors
- 3** Cloud, AI, and cybersecurity
- 4** Digital transformation of operations

01 Changes in the Macroeconomic Environment

Headwinds in Inflation and Growth Rates

There's no question that we live in challenging macroeconomic times. The inflation rate in the United States and many other parts of the world is higher than what we've seen in several decades.

According to recent IMF studies in [2022](#) and [2023](#), the global inflation rate reached 8.8% in 2022—up from 4.7% a year prior. In 2021, global economic growth was 6% and dropped to 3.4% in 2022. It is forecasted to fall to about 2.9% in 2023. The silver lining is that the global inflation rate is forecasted to go back down to approximately 6.6% in this year and then to 4.3% in 2024.

These two trends are only a fraction of the headwinds the c-store industry is facing, including labor shortages, supply chain disruptions, geopolitical instability, and many others.

However, this industry has always been very resilient. Before, during, and even after the height of the COVID pandemic, many operators continued to do well, which is a testament to their

operational excellence, as well as great customer value and strong brands. Moreover, the industry has seen "[a fourth consecutive year of strong profits.](#)" According to a recent [NACS publication](#), per-store sales increased by over 29% from 2021 to 2022.

This was largely thanks to increased fuel margins and strong foodservice performance. In fact, prepared food is leading the in-store category by a wide margin with an average 20.7% growth compared to 16.6% in salty snacks and 15.6% in the candy category.

Clearly, many retailers continue to exhibit operational excellence and embody the spirit of convenience. We have no doubt that this is at least in part thanks to the entrepreneurial and innovative spirit that remains connected to broader trends, including changing consumer behaviors.



» What innovations and changes to your business would help you weather these economic headwinds?

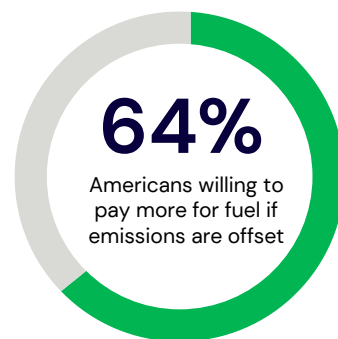
02 Shifting Consumer Shopping Behaviors



Changing Demographics and Patterns

It's increasingly clear that consumer shopping behaviors are undergoing a major shift. Younger consumers, such as those in Gen Z, were born in the Internet age and grew up with smartphones. These consumers are always connected, mobile, social media-savvy, and they expect information, commerce, and personalization at their fingertips. The oldest of this generation are now in their 20s and already shape many aspects of consumer spending and behavior where online and mobile shopping is the norm, rather than the exception. Older generations have also recently changed their purchasing patterns, including the embrace of digital in part due to the COVID pandemic.

This growth in online shopping has created another trend. A recent study published by McKinsey (covering retail in general) revealed that 80% of consumers want personalization from retailers. Thanks to many popular e-commerce platforms, consumers are used to and expect to receive offers not just targeted to their demographic but offers that are personalized to them as individuals. Yet only 23% of consumers believe that retailers are doing a good job when it comes to personalization.



ESG Factors and Energy Transformation

The next trend worth exploring is the emergence of Environmental, Social, and Governance (ESG) factors and the ongoing energy transformation, all contributing to a growing need for EV charging and sustainability incentives. According to [PEW Research](#), 71% of Americans continue to believe that the US should prioritize “development of alternative energy sources, such as wind and solar, over expanding the production of oil, coal, and natural gas.” In transportation, that will likely translate to increased adoption of EVs due to consumer demands and the regulatory environment.

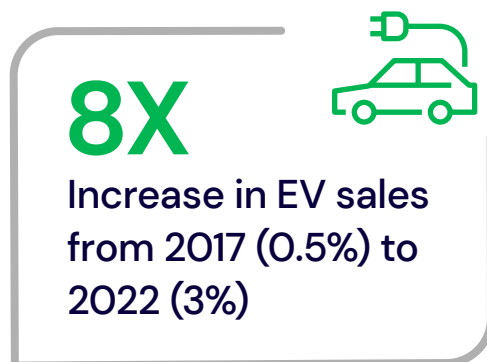
According to the [Fuels Institute](#), new plug-in electric (PEV) sales have increased by a factor of eight—from 0.58% in 2017 to 4.96% in 2022. While it’s difficult to predict to what degree this trend will continue and while the forecasted range is wide, the Fuels Institute also projects that by 2040, new PEV sales could be anywhere between 10% to 60%.

If sales do reach 60%, that would likely only represent 27% of light duty vehicles on the roads being PEV.

So, what does this mean for retailers?

The EV trend is not slowing down. However, there are many factors that will influence the need and the ability for retailers to provide EV charging. Among those factors are likely to be the penetration of EVs in a specific geography, business models, as well as a mix of other services that attract consumers.

The environmental considerations in consumer behavior will not only be reflected in the adoption of EV. In the [PDI Sustainability Index](#), we determined that 64% of consumers would be willing to pay more for fuel if the emissions were offset. This could translate to unique and differentiated loyalty programs for all consumers—not just those who have electric vehicles.





Foodservice

The last important consumer trend to address is foodservice. According to [NACS](#), while merchandise sales experienced 4.4% growth from 2021 to 2022, foodservice saw a more than 16% increase. Many more retailers are now competing directly with QSRs (Quick Serve Restaurants) and fast-casual alternatives than ever before. Some of those retailers see the younger generation's desire for healthier food options without compromising on speed and convenience.



- » How do you address changes in consumer behaviors and preferences?
- » How can you create a much better consumer experience?
- » How can you future-proof your business from a potential fuel demand destruction?

03 Cloud, AI, and Cybersecurity

Shift to Industry Cloud Platforms

While cloud usage by enterprises is now 20 years in the making, organizations continue to move more workloads to public cloud providers. In fact, this trend is so pervasive that 70% of critical applications are now in the public cloud. However, a relatively new trend is the emergence of Industry Cloud Platforms, which are designed to meet the specific needs of a particular industry. According to [Gartner's recent study](#), 40% of enterprises have started their adoption of Industry Cloud Platforms.

Unlike generic cloud providers, these platforms combine public cloud capabilities with specific industry workflows and data to address the challenges for a particular vertical. This enables organizations to accelerate their digital transformation processes and rate of innovation. Industry clouds like the one offered by PDI enable retailers to gain actionable insights from their data, fully digitize and transform their customer experiences, streamline and automate processes for store associates, optimize the supply chain, and improve loyalty.

Industry Cloud Platforms can also help organizations create “smarter” and more automated solutions by leveraging specific

industry data to train machine learning (ML) models. Those models create recommendations, provide predictive and prescriptive insights, automate processes, create better user experiences, eliminate manual data entry, and create a single version of the truth from disparate data.

AI in Enterprises

According to a recent [IBM study](#), 74% of enterprises believe that AI is a viable long-term approach for their business success. Likewise, 80% of businesses that take full advantage of AI end up dominating their vertical.

The top 10 common use cases for AI include improving various aspects of a business such as IT operations, digital and data security, data management and classification, marketing analysis, sales forecasting, customer experience optimization, customer self-service, fraud detection, and logistics.

However, leveraging AI isn't always easy. Challenges such as poor data quality and technology complexity remain significant barriers to AI adoption.

70%



of critical applications are now in the public cloud

74%



of enterprises believe AI is a viable long-term approach to success



Cybersecurity

It's clear that cybersecurity incidents can wreak havoc on organizations that are ill prepared. According to [Splunk](#), 49% of organizations have suffered some kind of data breach in the last two years. As many as 79% of organizations have encountered ransomware attacks. Likewise, the new class of supply chain attacks has caused 97% of organizations to take action—whether that's increasing their cybersecurity budget, creating better controls, or simply patching their systems.

Industry Cloud Platforms are well positioned to protect organizations from cybersecurity events, precisely because providers understand the threat vectors that are specific to industry verticals, industry data, the complexity of the retail environment, and the specifics of the fuel supply chain.



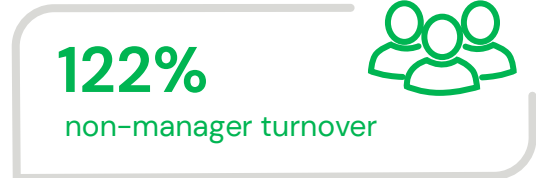
- » How can you create more agile and streamlined IT operations?
- » How do you gain more insight about your operations and consumers?
- » How do you better protect your business from cybersecurity threats?
- » How can you automate certain parts of your business?

04 Digital Transformation of Operations

The last key trend is primarily relevant to retailers, but many other organizations can likely relate to it. Specifically, many businesses deal with continued supply chain challenges, including stock-outs, increased costs, and labor shortages. According to [NACS](#), the average non-manager annual turnover in convenience retail was above 120% in 2022. Likewise, most stores saw on average a 13.4% increase in their direct store operating expenses (DSOE) between 2021 and 2022.

Retailers also face increased customer demands to support omnichannel experiences, such as mobile ordering and delivery as well as frictionless checkout. Not surprisingly, consumers want more convenience, including bypassing the checkout counter altogether.

However, these challenges can become opportunities. Labor shortages could be the genesis of automation, whether that involves doing more with the same or reduced staff by automating aspects of the back office, leveraging gig workers, predicting out-of-stocks, or providing even more convenience to consumers via mobile ordering, self-checkout, or frictionless checkout.



- » How do you achieve more with the same staff?
- » How do you automate your business and still delight consumers?
- » Can you utilize gig workers in your business?
- » How do you predict and eliminate out-of-stock situations?

Innovation Happening at PDI

The PDI New Product Development Process

No organization has enough resources to address every challenge or opportunity. The most difficult aspect of any innovation process is determining what a team should focus on and what creates the most value for customers.

Our innovation process always starts with customers. It’s not about cool, new and shiny technology. It’s about what real-world challenges and opportunities we can solve. We typically manage a list of innovative new ideas and opportunities that come from our customers, employees, or the industry at large. We call this the IDEATE stage, which results in a prioritized backlog of ideas. We then take the best and most promising ideas and validate them with customers.

Next, in our DISCOVER process, we make sure customers find these innovations valuable and commercially viable. We define these ideas further using our Design Thinking process. The ideas that show promise exit the DISCOVER process and enter the INCUBATE stage. At that point, we create a Minimum Viable Product (MVP) and invite a small group of customers to try it. The products that exhibit general market interest and traction then move to the INTEGRATE stage. As the name suggests, these products are then fully integrated within the broader PDI business.



Here are a few new offerings from our innovation process that are helping the industry connect convenience.

PDI Commerce API

Most of our recent innovations have focused on unlocking the power of data across PDI products, streamlining workflows, improving data accessibility via APIs, and transforming user experiences. In terms of data, our aim is to leverage PDI Web Services to create a single source of truth across various PDI products. In this single source of truth, key data is easily accessible, enables cross-product insights, and improves cross-product workflows. The same data would also be accessible to customers who leverage their own business intelligence tools instead of advanced analytics from PDI. We're already well on this journey with a data lake infrastructure that reaches over 46 TB and ingests 160 GB of data every month, leveraging the power of Big Data.

Unfortunately, many c-store retail systems do not have open architectures or open APIs, making it difficult to access data for effective decision making or to improve innovation. This problem was most evident in the beginning of COVID, as c-stores tried to enable Order Ahead and Delivery in their stores. As a result, we created the PDI Commerce API that now enables retailers to seamlessly take advantage of third-party mobile ordering, delivery, and self-checkout/frictionless checkout vendors

while keeping PDI Enterprise as their system of record. More specifically, the PDI data lake infrastructure has enabled us to move the PDI Enterprise pricebook into a multi-tenant cloud environment where we can securely expose it via the API. The PDI Commerce API not only exposes the pricebook, but also enables us to ingest transactions and persist them back in PDI Enterprise.

Coming Soon: PDI Electronic Shelf Labels Integration

We're also working on additional innovations. As labor shortages continue, retailers look to automate as much as possible. One such automation comes in the way of electronic shelf labels where prices can automatically be pushed from PDI Enterprise to both the in-store POS and to the labels. Our upcoming version of the PDI Commerce API will enable retailers to purchase electronic labels from us and easily integrate them with PDI Enterprise. The prices will be pushed to labels in near-real time and will be in sync with the in-store POS.

Coming Soon: Data Broker

While PDI customers can take advantage of the PDI POS in some geographies, we recognize that the ecosystem of providers that retailers can choose from is vast. We believe in creating an open ecosystem where third-party systems can easily integrate and ultimately provide the best value for our customers. As a result, we are modernizing our data integration frameworks to enable better ingestion of third-party POS data into PDI products while at the same time reducing the IT footprint in the store. This framework will also serve as a foundation for any data integration between customers, third parties, and PDI.

PDI Commerce API first month results



- » One order ahead and delivery vendor and two self-checkout vendors
- » Integration with many more in progress
- » Four retailers with 1,700+ sites
- » Dozens of retailers in progress

Conclusion

There's no doubt the c-store industry and the broader energy sector are facing their fair share of challenges. Yet, the industry has historically been very resilient, and we don't believe that the future will be any different. While the macroeconomic landscape remains difficult, consumer preferences keep changing, technology advancements are relentless, and cybersecurity threats are ever-present, we're confident that PDI customers will not only rise to meet these challenges but also take advantage of the opportunities that arise.

At PDI, we continue to be optimistic and remain dedicated to providing value with a keen focus on innovative new solutions.

To learn more about our innovation strategy, email us at innovation@pditechnologies.com or visit pditechnologies.com.



About PDI

With 40 years of industry leadership, PDI Technologies, Inc. resides at the intersection of productivity and sales growth, delivering powerful solutions that serve as the backbone of the convenience retail and petroleum wholesale ecosystem. By “Connecting Convenience” across the globe, we empower businesses to increase productivity, make informed decisions, and engage faster with their customers. From large-scale ERP and logistics operations to loyalty programs and cybersecurity, we’re simplifying the industry supply chain for whatever comes next.

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