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10 Data and Analytics Trends Retailers and Restaurants Should Consider

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As customer expectations, demands, and avenues for consumption change and as regulatory priorities evolve, many of today's leading retailers are investing in new data technology solutions that have the potential to deliver significant cost savings, improve customer service, and help them gain or retain a competitive advantage.

But every new opportunity also introduces new challenges that must be considered and addressed. Following is an overview of some of the major data- and analytics-related trends that are affecting the industry today.

Industry context – what's driving the trends

The competitive, regulatory, and technological landscape in the overall retail and restaurant sector has evolved rapidly in recent years. Key drivers include changing customer expectations – including a growing sensitivity to price and a much higher demand for convenience and accessibility such as advanced mobile applications.

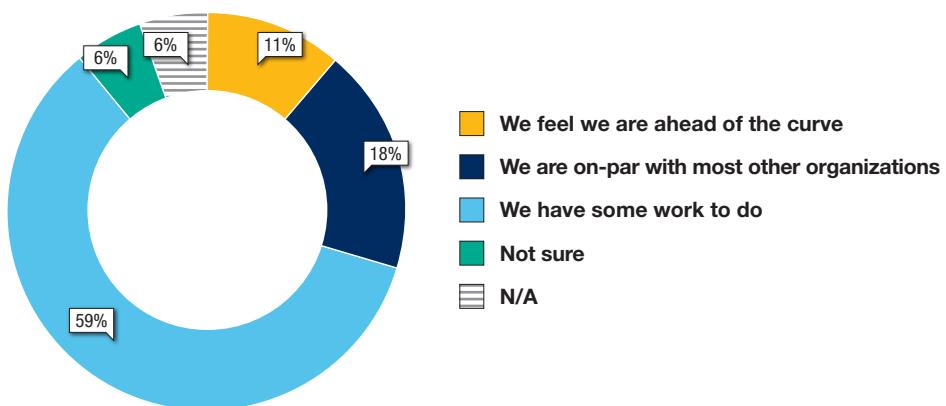
Competition from semi-retail technology companies helped accelerate these changes, and at the same time, traditional brick-and-mortar retailers found themselves under continuing pressure to lower costs and improve overall efficiency and effectiveness. In response to these pressures, the nation's largest retailers have been working aggressively in recent years to take advantage of fast-changing technological advances.

Traditional brick-and-mortar and “mom-and-pop” owned retailers and restaurants, on the other hand, often find they must allocate their more limited resources carefully in order to achieve the greatest possible benefit for their technology investments. As a result, the rate at which retailers and restaurants are adopting various advanced data science tools varies widely among individual companies and niche industry players.

For example, when restaurant and retail professionals in a recent Crowe virtual symposium were asked to characterize their institution's adoption of advanced data science technologies and techniques, 59% of those responding said their organization “had work to do” before they would consider themselves to be on-par with competitive organizations. Just 11% reported that they felt their restaurant or retail organization was ahead of the curve in implementing new technologies or techniques in advanced data science (Exhibit 1).

Exhibit 1: Restaurant and retail organizations' current adoption of advanced data science tools

How would you categorize your company's adoption of advanced data science technologies and techniques?



Source: Online survey of Crowe virtual symposium participants, May 2, 2019

Top 10 data technology trends

For retail and restaurant organizations that currently have data science projects at various stages of development, the most immediate challenge often is deciding where and how to allocate their available resources. Advanced data science applications offer promising benefits in a variety of areas including marketing and sales, operations and inventory management, customer intelligence, point-of-sales transactions, and risk and compliance.

Establishing priorities among such widely varied and important programs can be difficult. Here are 10 significant areas of concern that restaurant or retail organizations should consider as they evaluate their technology priorities:



1. Artificial intelligence (AI) and machine learning adoption

The retail and restaurant industry's adoption of advanced data analytics tools has begun accelerating in recent years as a growing number of companies have come to recognize the potential benefits of such tools. Broadly speaking, industry leaders have demonstrated a number of ways in which AI – the ability of a machine to perform cognitive tasks such as problem-solving, learning, perceiving, and reasoning – can enable faster, more consistent decision-making.

More specifically, one particular form of artificial intelligence, machine learning, uses self-adaptive algorithms to identify patterns in data, which then can be used to make predictions about the probability of certain actions, such as customer purchase decisions or additional purchases off of original purchase. At an even more advanced level, deep learning technology uses algorithms that attempt to mimic the human brain by using hierarchical layers. This capability is particularly useful in performing specific tasks, such as customer segmentation, involving large amounts of data.

With other recent advances such as natural language processing and image recognition, leading organizations are identifying potential applications in nearly every area of the company, including operations, inventory management, customer intelligence, sales and marketing, point-of-sales decisions, and risk and compliance. As a result, the industry is likely to see increasing levels of investment in both the technology and the people needed to take advantage of these capabilities.

2. Data warehouses and data lakes – avoiding the data swamp

Despite some observers' contention that a centralized data warehouse is an outdated concept, for most retail and restaurant organizations this remains a critically needed function. Big data and nimble tech-retail competitors did not eliminate the need for a centralized, trusted data source within an organization. In most instances, the move to so-called data lakes only shifted the governance burden – creating “data swamps” in which there are numerous islands of uncontrolled data.

The lack of a single trusted source of data inevitably leads to the common practice of individuals maintaining their own personal copies of frequently used financial or customer data, or developing their own spreadsheets to perform specific analyses. Such data islands or silos dramatically increase risk – and typically generate performance issues as well.

3. Customer experience taking center stage

Today's most successful retail and restaurant organizations place a high priority on customer-centric initiatives, such as the use of predictive models that anticipate customer behavior and enable greater personalization and responsiveness. As such, customer relationship management (CRM) is back in the spotlight, especially in the face of increased emphasis on digital strategy and customer experience.

The concept of a 360-degree view of the customer relationship has broadened, however. In addition to encompassing all of a customer's purchases and interactions with the organization, today's 360-degree view also must incorporate a social media presence. To remain competitive, companies cannot be satisfied with a digital strategy or a CRM approach that is merely adequate.

4. Cloud adoption increasing

The use of cloud technology continues to expand, with more and more organizations using cloud servers rather than local hardware to host both data storage and business processes. Privacy concerns are less of a barrier than they were in earlier years, but the use of outsourced processes creates a more complex computing environment, with increased emphasis on the control of data lineage and management of third-party risks.

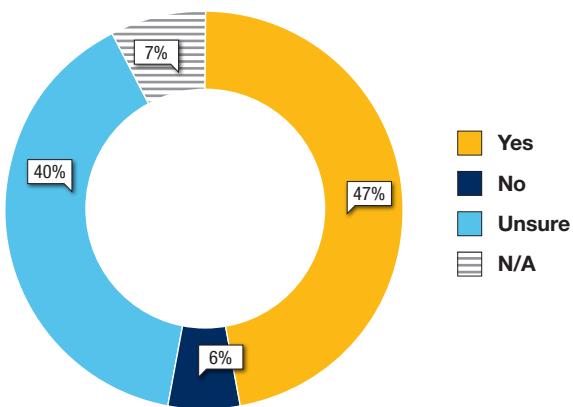
5. Blockchain advances turning the corner

Tech companies are investing heavily in developing blockchain technology, but the adoption of such distributed ledger tools is still in the early stages within the retail and restaurant services industry. Blockchain offers great promise in areas such as fraud reduction, improved know-your-customer and customer due diligence processes, and the use of smart contracts for handling payments and other transactions.

The next 12 months could be a watershed year as many in the industry watch to see how the largest retail and restaurant organizations work to develop a truly scalable and secure global infrastructure, while also waiting to see the role that regulatory oversight will play. Additionally, many in the industry are looking at other industries, such as banking, where great progress and improvements are being made in blockchain. Many will prefer to be adopters versus early leaders in this new and complex technology.

Exhibit 2: Restaurant and retail organizations' view of the role of blockchain in data collection

Do you see blockchain changing the way data capturing and usage evolves in retail?



Source: Online survey of Crowe virtual symposium participants, May 2, 2019

When attendees of the Crowe retail and restaurant virtual symposium were asked if they see blockchain changing the way data capturing and usage evolves in their industries, nearly half of respondents answered "yes" (Exhibit 2).

6. Cybersecurity as a continuing priority

A 2018 study by ISACA, an international professional association focused on IT governance, found that, for the fourth year in a row, cyberattacks continued to increase, but the methods used to combat them remained relatively static.¹ Cybersecurity is a fast-changing area of concern, with a continuing need to develop solutions that anticipate what cybercriminals might attempt as they look for the path of least resistance to sensitive information. What works today might not be effective in six months.

It is also important to remember that cybersecurity is not solely an information security function or responsibility – all departments and functions need to understand their role in managing and protecting confidential data.

7. Evolving data privacy regulations

The European Union's General Data Protection Regulation and the U.S. *Federal Trade Commission Act* remain the most prominent regulations governing how retail and restaurants share and protect customers' private information, but more recent regulatory actions by states, such as the *California Consumer Privacy Act*, are adding further complications. There no doubt will be more regulatory revisions from other states in the near future, so companies need to continually review and evaluate their data privacy policies and practices.

8. Sharper focus on data risk and managing dark data

In its most basic form, "dark data" is data that is retained by an organization but not actively used, mined, or governed. While such data could present additional opportunities for useful intelligence, it also increases a company's risk exposure, particularly in view of some of the other trends already noted, such as increased adoption of AI and greater reliance on cloud technology. As a result, data risk is likely to be an area of increased focus and investment, with the need for retailers and restaurants to actively monitor the use of nonquality data for critical decisions.

9. Audit's evolving role

One of the questions growing out of the adoption of AI, machine learning, blockchain, robotic process automation, and other types of advanced technology is how audit committees and internal audit departments will adapt their policies and procedures in order to continue fulfilling their oversight responsibilities. In late 2018, the Center for Audit Quality published "Emerging Technologies: An Oversight Tool for Audit Committees,"² which provides a framework and questions to help guide audit committees as these emerging technologies take hold.

10. Increased emphasis on data governance

As technology advances, and as regulatory and financial reporting requirements continue to evolve, the risks associated with untrusted, ungoverned, and uncontrolled data will continue to increase. The need for a trusted, single source of data with strong governance and control has never been greater, especially when data is being used for purposes for which it was not originally intended.

Key data governance requirements include the ability to audit the full life cycle of data, from collection to consumption, including oversight of such basic issues as data lineage, access, controls, and transformation. A commitment to data governance should be manifested in organizational features such as a data governance board or committee, the appointment of a chief data officer or chief protection officer, and an increased audit focus on data repositories.

Why data governance is so critical

In addition to being critical to effective risk management, strong data governance also contributes to improved organizational performance and competitiveness. For example, as retailers and restaurants address profitability challenges, the ability to make sound, objective, fact-based decisions is increasingly important. Having ready access to reliable, up-to-date performance data is essential to reducing unit costs and improving operating efficiency. The underlying foundation for such access is a sound data governance program, which will enable users to trust that the data that is collected, reported, and analyzed is accurate – without question or hesitation.

In the same way, some of the fundamental challenges retailers and restaurants must address in order to develop better customer insight also revolve around the data itself. Taking advantage of the rapid advances in AI and improved data analytics will be imperative for organizations to remain competitive. Trusted, accessible data is the essential fuel that will drive this effort as well.

While most retailers and restaurants these days are relatively mature in terms of their IT infrastructures and the ways that they handle the rollout of new product or new software applications, the same levels of scrutiny and control often are not applied to the data itself. This is another example of when data governance becomes crucially important.

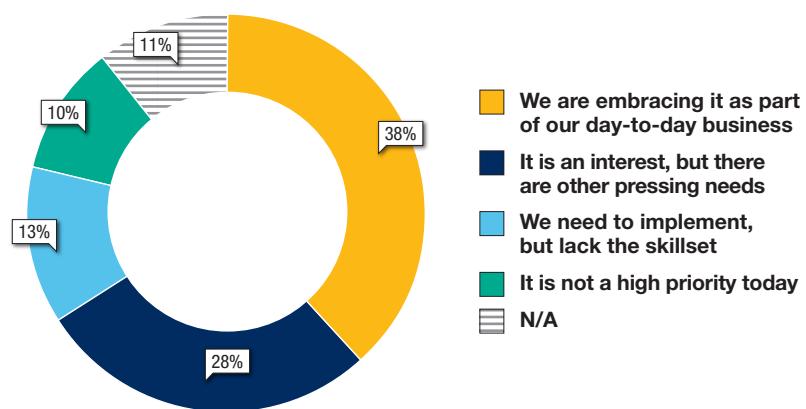
The objective of data governance is to see to it that data is managed as a business-critical organizational asset, comparable to an organizational utility. Just as users turn on a light switch without thinking about how the power is delivered or whether the light will be reliable, they also should be able to access data with similar confidence.

Industry experience suggests many companies still have some work ahead of them before achieving that level of performance, however.

For example, when restaurant and retail executives in the virtual symposium referenced earlier were asked about their institution's data governance practices and principles, 38% responded that they are embracing these as part of their day-to-day business. Ten percent responded that it is not currently a high priority for their business (Exhibit 3).

Exhibit 3: Restaurant and retail organizations' adoption of improved data governance practices

How has your organization begun to embrace improved data governance practices and principles?



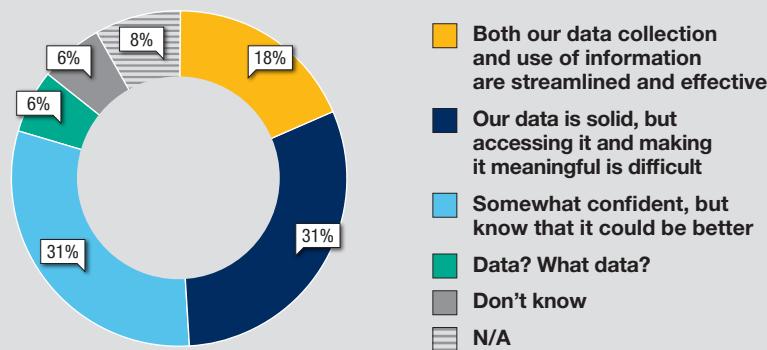
Source: Online survey of Crowe virtual symposium participants, May 2, 2019

Today's rapid technological advances, coupled with the sheer volume of data involved, can make developing effective data governance seem like an overwhelming challenge. The specific issues, priorities, and solutions are constantly changing, which is one reason retailers and restaurants of all sizes should regularly reassess and, if necessary, enhance their data governance programs. Getting started now is essential, even if the effort must begin on a smaller scale, and even if mistakes are made during the process. When it comes to improving data governance, the biggest mistake is to delay the effort.

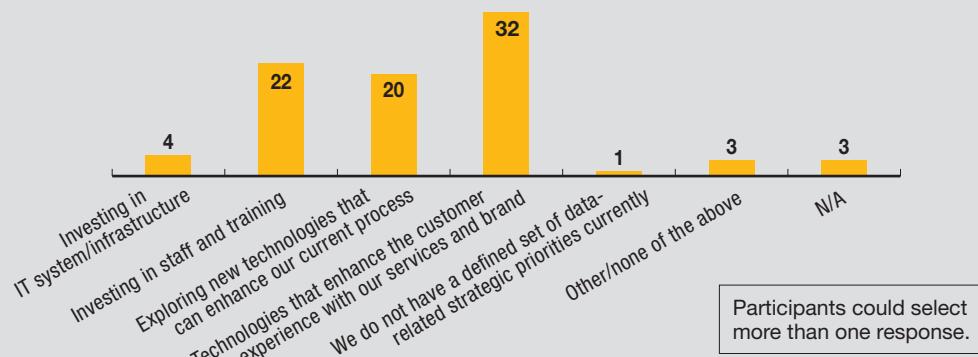
As competitive pressures mount and regulatory priorities continue to evolve, organizations inevitably will need to make additional investments in new data technology systems and solutions. By recognizing and understanding today's top data trends, management teams will be better able to prioritize the various projects they are considering and do a better job of allocating their available time, money, and resources in ways that maximize the potential benefits these advanced solutions can offer.

Additional data gathered during the May 2, 2019, Crowe virtual symposium

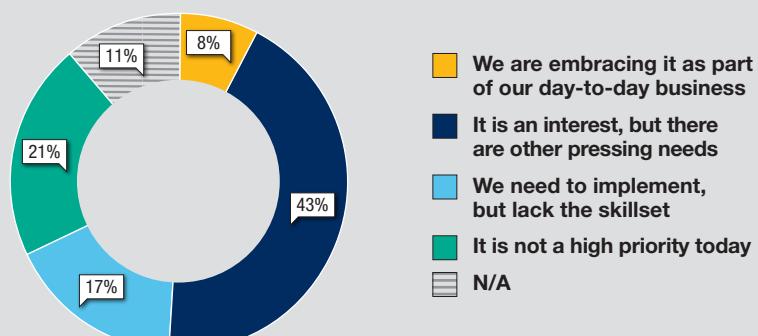
How confident are you in the “data” used to support operations, analytics/reporting, and strategic decision-making efforts?



Which of these data-related strategic priorities are at the top of your organization’s list for 2019/2020?



How do you see AI and robotics with regards to data analytics as an organizational priority?





Learn more

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¹ "State of Cybersecurity 2018, Part 2," ISACA, June 2018,
<https://cybersecurity.isaca.org/csx-resources/state-of-cybersecurity-2018-part-2>

² "Emerging Technologies: An Oversight Tool for Audit Committees," Center for Audit Quality, Dec. 12, 2018,
<https://www.thecaq.org/emerging-technologies-oversight-tool-audit-committees>

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