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Technology ABC & D's: AI, Barcodes, Convenience, & Data

INCLUDES RETAIL MEDIA
NETWORKS UPDATE

FEATURED SPEAKERS



Gena Morgan
Vice President of Standards, GS1



Liz Sertl
Sr. Director, Supply Chain
Visibility, GS1



Randy L. Allen
Senior Lecturer at the Cornell SC
Johnson College of Business



**Facilitator:
Ed Collupy**
Collupy System Solutions LLC.

VISION REPORT OCTOBER 2024

CTVG MEMBERS 2024



Sanjit Bajimaya
Loop Neighborhood



Jeffrey Carpenter
Clifford Fuel



Jason Collins
Englefield Oil Company



Christopher Egan
United Dairy Farmers



Steve Evans
Haffner's/Energy North Group



Janeth Falcon
Circle K



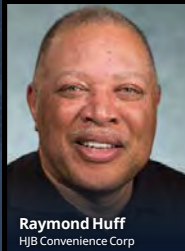
Erin Graziosi
Robinson Oil Corp



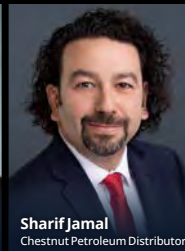
Robert Hampton
Jacksons Food Stores



Jeffry Harrison
Rovertown



Raymond Huff
HJB Convenience Corp



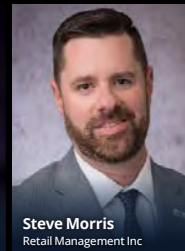
Sharif Jamal
Chestnut Petroleum Distributors



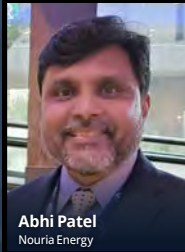
Paul Kern
Invenco by GVR



Bill Miller
GK Americas



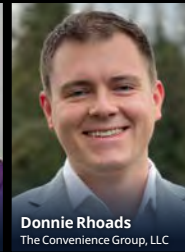
Steve Morris
Retail Management Inc



Abhi Patel
Nouria Energy



Nick Peters
Campbell Oil Company



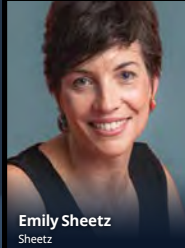
Donnie Rhoads
The Convenience Group, LLC



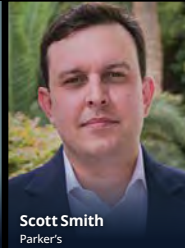
Bill Ridge
Eastern Petroleum Corporation



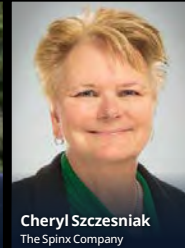
Rick Sales
Abierto



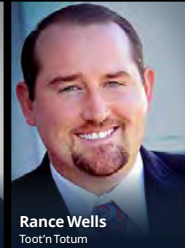
Emily Sheetz
Sheetz



Scott Smith
Parker's



Cheryl Szczesniak
The Spinx Company



Rance Wells
Toot'n Totum

VISION GROUP NETWORK CO-FOUNDERS



Myra Kressner
Kressner Strategy Group



Eva Strasburger
StrasGlobal/Compliance Safe



Roy Strasburger
StrasGlobal/Compliance Safe

We are Convenience Technology Vision Group (CTVG), a group of invited leaders of the convenience industry who have volunteered our time to help our fellow retailers, solution providers and product suppliers. The only reason we gather is to discuss, debate and share our experiences and ideas. Each of us is offering our personal opinions. We are not looking for “group think” — we are promoting problem solving and looking to the future. We make our conversations available to everyone in the industry through CTVG Vision Reports. These reports will help you better understand current challenges, solutions, and opportunities while giving you access to different opinions and perspectives, regardless of the size of your business.

Convenience Technology Vision Group is part of the Vision Group Network, whose mission is to gather the best minds in the industry, put them in a virtual room, and let the ideas and opinions develop

This **CTVG Vision Report** is comprised of three parts:

CTVG Views provides a summary of the conversation with additional resources for extra context including and “Valuable Resources” for more in-depth education.

In The Room With CTVG provides you with the meeting transcript, tagged for easy reference, so that you can be “in the room” with us, rather than only having access to selected quotes and paraphrasing.

The full presentations “The Next Dimension of Barcodes” and “AI in Retail Survey Results and Insights” are included and linked throughout the transcript for easy navigation.

We highly recommend that you read all three components.

The main topics in this CTVG Vision Report:

PART I: Sunsetting the 50-Year-Old UPC Barcode

- **Beyond the Beep**
- **Foodservice Applicability**

PART II: AI in Retail: Survey Results and Insights

- **Learning Outside the Channel**
- **Challenges for Smaller Retailers and Partnering With Vendors**
- **Use Cases and Practical Applications**
- **Expanding the View**

Lightning Round Review



CTVG thanks our **Ally Supporters**



For retailers looking to connect with their consumers in an always-on world, Rovertown's app platform provides the flexibility needed to deliver personalized, meaningful experiences. Unlike our competitors, Rovertown integrates with any technology vendor and goes the extra step to ensure our clients' success through best-in-class implementation and support.

Rovertown was originally founded in 2009 with the goal of helping cost-conscious college students across the United States to access the best discounts for local food and services. By eliminating the need to swipe an ID for discounts, the experience was brought to students' mobile devices in real-time with custom, localized deals.

Rovertown's business has since grown and evolved, but the humble beginnings taught the team the power of personalized experiences delivered through high-quality, branded apps. The Rovertown app platform now powers the mobile experiences of many leading regional convenience retailers.

CONTACT:

Jeffry Harrison

Co-Founder & President

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With over 15 years of experience in the convenience store industry, Abierto understands the challenges retailers face in engaging consumers with on-premise messaging. Leveraging cutting-edge technology and dedicated in-house software development and design teams, we create custom, innovative, and integrated digital consumer engagement and messaging solutions tailored for multi-site convenience store retailers.

Headquartered in York, Maine, Abierto powers displays for leading industry retailers nationwide. Our advanced cloud-based platform, OPEN., is a robust yet user-friendly tool that automates digital content distribution and remote device management tasks across store networks. OPEN. also provides detailed content distribution analytics, enabling retailers to optimize their in-store messaging.

In 2020, we introduced OPEN.LED, a groundbreaking line of transparent, adhesive window displays designed to increase in-store traffic by dynamically engaging consumers in the forecourt and parking areas of convenience stores and travel plazas. Today, these displays sport stunning high resolution and brightness for an "impossible to ignore" messaging experience.

Abierto's team of seasoned designers, engineers, developers, and implementation experts work together to help clients execute their vision with precision and creativity. Execute your Vision with Abierto!

CONTACT:

Rick Sales

President

rick@ab-net.us

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SUPPORTER SPOTLIGHT

Rick Sales, Abierto's president, recently joined Philip Santini from Rutter's on the NACS Convenience Matters podcast where they discussed Rutter's on-premise digital transformation. You can check out the episode [here](#).

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You may know us as Gilbarco Veeder-Root, but it's time to get to know Invenco by GVR. In 2023, Gilbarco's well-established Retail Solutions division merged with Invenco, a global frontrunner in the payments and convenience store sectors. Our combined expertise is set to revolutionize the convenience retail space, offering cutting-edge, flexible technology solutions designed to boost efficiency and enhance customer engagement.

Invenco by GVR has a global footprint with industry-leading point-of-sale systems, payment solutions, site automations, workflows, and cloud services. These solutions will be integrated into the ground-breaking iNFX retail operating system to enable digital agility and rapidly deploy new capabilities to our customers. Invenco by GVR Solutions can be found in nearly 165,000 connected devices across 50,000 convenience stores in more than 50 countries. We are redefining convenience, together.

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Larry Bowden

*Director, Retail Solutions Sales
larry.bowden@invenco.com
invenco.com*



GK Software breaks down the barriers to unified commerce with its open CLOUD4RETAIL platform and a broad portfolio based on it, like OmniPOS for point of sale, self-checkout, mobile POS, GK Drive for forecourt control, mobile customer engagement and a full range of store/back-office solutions. The company is a recognized leader in omnichannel retail, offering a single, global software platform for all retail formats and touchpoints. Ten of the Top 50 retailers worldwide rely on GK, and GK is the fastest growing global POS provider in new installations over the last three years.

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Bill Miller

*Vice President, Head of Sales - GK Americas
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gk-software.com*

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CTVG VIEWS

A CONVENIENCE TECHNOLOGY VISION GROUP DISCUSSION

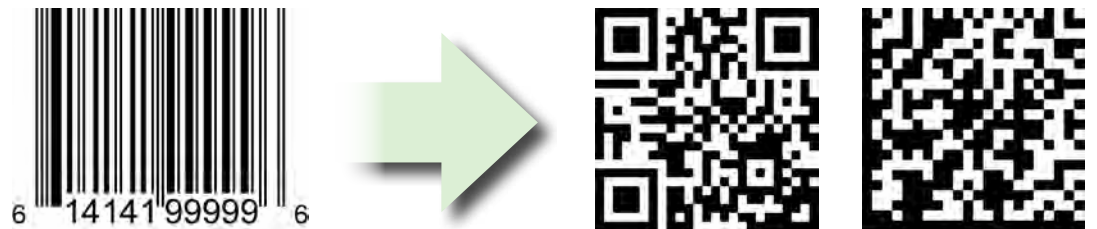
The September 13th, 2024 meeting of the Convenience Technology Vision Group (CTVG), facilitated by Ed Collupy, focused on two topics: the transition from UPC barcodes to 2D barcodes and a recent Cornell University study on retail AI usage. After the presentations, CTVG members explored each topic further and shared their experiences and perspectives. A Lightning Round Review from the most recent June meeting focusing on Retail Media Networks (RMN) also took place.



PART 1

Sunsetting the 50-Year-Old UPC Barcode

Sunrise 2027 represents a significant milestone in the evolution of barcode technology, focusing on the transition from traditional 50-year-old UPC barcodes to 2D barcodes. CTVG members received a thorough presentation from **Gena Morgan**, vice president of standards and **Liz Sertl**, senior director of supply chain visibility, both from the non-profit global standards organization GS1.



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The transition is backed by industry-wide collaboration and aims to enhance retail and brand efficiencies and consumer empowerment by integrating more detailed product information. This change seeks to meet increasing demands from stakeholders such as retailers, consumers, and packaged goods companies who require more data on product safety, sustainability, traceability, and inventory management. The move to 2D barcodes will not happen abruptly but will be a gradual process leading up to the December 2027 transition with further evolution beyond that date.

This is a global shift, also referred to as Ambition 2027 outside the US, and is supported by research and planning that will ensure a smooth transition across retail environments.

2D barcodes, encoded with a GS1 identifier, offer several advantages over 1D barcodes, including the ability to store more data in a smaller footprint such as expiration dates, batch numbers, and supply chain data. Presented as a data matrix or a QR code (see image example on page 5), the 2D barcodes are expected to “go beep” at a traditional POS checkout and also support more engaging consumer experiences by providing access to product stories and data and even personalized content, such as region-specific recipes in a consumer’s preferred language.

Learn more about Sunrise 2027

GS1 U.S. website

December 2024 Conexxus webinar on Sunrise 2027: *How to Make the Sunrise: The Technical Side of Implementing 2D Barcodes*

Beyond the Beep

Collupy opened the discussion turning first to an Ally Supporter solution provider for his perspective. **Paul Kern**, product leader for Invenco by GVR, said he appreciated the proactive communication around the upcoming adoption of 2D barcodes, unlike other industry changes that are often communicated at the last minute. He highlighted the need for retailers and vendors to carefully plan the transition, noting that his team hasn’t started implementation yet is considering when to begin incorporating these changes into their systems.

Kern also mentioned in the meeting’s Microsoft Teams chat his concern about how the new barcodes would function in self-checkout, particularly around the possibility of multiple codes on one product leading to issues like double scans or requiring reprogramming of scanners.

Donnie Rhoads, director of business development for The Convenience Group, LLC, reported that sales associate “struggles with scanning correct barcode are already manifesting from what I have seen.” He admits it is a “small problem, but a persistent one.”

Morgan acknowledged that training will be key and that most modern optical scanners are capable of reading the new 2D barcodes. She noted that about 85% of retailers will have the necessary scanners by the time of implementation in 2027. She further explained that firmware upgrades would be required for older scanner models, but manufacturers have worked over the past five years to prevent issues like double scanning. Morgan reassured that testing is underway, particularly with self-checkout systems, and that GS1 is working closely with major scanner and POS system manufacturers to ensure the transition is smooth.

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“When you start talking about additional use cases and what kind of information can be put in a 2D barcode, you start thinking about things like more granular inventory management. You can manage information by expiration date for freshness, and also reduce waste, sustainability because recycling information, and then waste prevention, again, traceability, sourcing information, consumer engagement.”

Liz Sertl, Senior Director of Supply Chain Visibility, GS1

Another Ally Supporter **Bill Miller**, vice president, head of sales for GK Americas, followed up saying his company is already well-equipped to support various barcode symbologies, including QR codes. Miller emphasized the advantages the new barcode system could bring for inventory control, such as preventing expired products from being sold or automatically flagging recalled lot numbers.

Englefield Oil Company's Director of IT, **Jason Collins** commented in the Microsoft Teams chat that he “would lean on our vendors for [the transition].” Specifically, he suggested he would look for assistance from “the point of sale and back-office price book provider and then the manufacturers of the products for the information in the 2D Barcode.”

Loop Neighborhood IT Director **Sanjit Bajimaya** expressed concern about the broader data implications of the 2D barcode transition, particularly regarding how Connexus should adapt its data dictionary standards. Morgan reassured him that Connexus is part of the ongoing

discussions and that GS1 is actively working with major POS vendors to address these needs.

Abhi Patel, director for information technology at Nouria Energy, posed a forward-looking question, asking how AI could play a role in leveraging 2D barcodes and whether the new technology could enable audio feedback at self-checkouts.

Morgan confirmed that 2D barcodes could unlock a variety of experiences beyond basic inventory management and customer service, depending on how retailers choose to implement them. She stressed that the potential applications are broad, ranging from traceability to consumer engagement, but that much of this innovation lies ahead.



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Foodservice Applicability

Collins indicated that his company would rely heavily on its vendors to manage the transition. However, on self-labeled products, specifically deli items, he noted that they would need to figure out how to handle the packaging and labeling, especially if they want to include data such as expiration dates.

Nick Peters, Campbell Oil Company's vice president of IT, asked if the new barcode system could eventually replace package caloric nutritional labeling. Morgan said that while she couldn't speak for regulatory bodies like the FDA, there is some precedent for this in the form of SmartLabel, a system that uses QR codes to provide information about ingredients.

She suggested that adding the data syntax to the existing SmartLabel QR code could potentially make that code useful for both reasons.

Interestingly, Morgan pointed out that several grocery retailers in the U.S. and Europe are already running pilots, particularly focusing on ensuring the barcodes work seamlessly at checkout. However, she clarified that no retailer had fully rolled out the technology yet. Morgan confirmed that China is moving faster than most toward 2D barcodes, and that the transition would apply to both traditional and non-traditional point-of-sale systems.

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PART 2

AI in Retail: Survey Results and Insights

AI has been discussed in several Vision Group Meetings. Download the following Vision Reports to further explore this topic.

- CTVG Vision Report CTVG Generative AI and Retailing: Real Results and Real Challenges, January 2024
- CTVG Fighting for Tomorrow's Customers (Lightning Round Review on AI), April 2024
- CTVG Retail Media Networks (Lightning Round Review on AI), July 2024
- CLVG Currents of Change, January 2023
- CLVG AI: Predictive Fuel and Dynamic In-Store Pricing, December 2023
- CLVG Dawning of a New Era, June 2022

The second presentation of the meeting was given by **Randy L. Allen**, senior lecturer at the Cornell SC Johnson College of Business, on her survey of AI's role in retail amongst Convenience and General Merchandise retailers. Earlier this year, Vision Group Network (VGN) had distributed the survey to members to gather responses. As the survey was conducted in collaboration with NACS, VGN invited **Lori Stillman**, NACS vice president of research and education to attend this CTVG meeting as a guest. Although the research and analysis of the data is ongoing and results will eventually be published, CTVG members were treated to the preliminary results.

The study found that, to nobody's surprise, AI in retail is still in its early stages, especially in the Convenience sector. The other group surveyed—General Merchandise (footwear, jewelry, beauty, big box, discount, and electronics)—is

further advanced in their use of AI with “a little bit more experience and usage,” according to Allen.

A large swath of convenience company types was studied from small and large companies with an even balance on job roles from c-suite to directors. Allen found that c-suite leaders view AI usage positively and that it “needs to be essential for remaining competitive.” VPs and directors were found to be more cautious given the complications with implementation.

Comparing and contrasting the two retail sectors, Allen discovered that Convenience retailers are focusing on using AI to streamline backend operations like human resources and inventory management, while General Merchandise retailers are more likely to use AI for customer-facing innovations, such as marketing and e-commerce. Both sectors are using AI for administrative support, store operations,

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data visualization, reporting, and system development. However, both sectors are still experimenting with the technology with varying degrees of success. She noted that AI's role in increasing employee productivity has been the biggest immediate benefit overall, with no significant reductions in workforce observed due to AI implementation thus far. The Convenience sector is using it more efficiently to identify job candidates and career advancement.

The study also uncovered challenges in AI implementation, including high costs, solution readiness, and a general lack of knowledge about AI tools. Allen suggested that smaller convenience store operators might benefit from collaborating with

vendors or forming shared groups with general merchandise retailers to tackle these hurdles. Just like the old adage that 'practice makes perfect,' Allen commented that "as people implemented more, it went up in effectiveness."

The slide presentation is included at the end of this report and includes many graphs and charts not presented at this meeting.

Learning Outside the Channel

In the discussion after the presentation, several members urged that information gathering about AI is the best place to start the process. Miller emphasized the value of learning from innovations in other retail sectors, highlighting the National Retail Federation (NRF) annual convention as a key learning opportunity for convenience retailers to gain exposure to advanced technologies beyond those typically seen at industry events like NACS. **Rick Sales**, president of Abierto, also supported the idea of attending broader retail events, noting how AI discussions at NRF had grown exponentially, with more retailers showing interest in AI

even if they didn't fully understand its application yet. Also of note, Facilitator Collupy leads "Booth Crawls" for Conexus members at each annual NRF event.

Stillman suggested a number of suggested NACS education sessions that focused on AI at the 2024 NACS Show and **Rance Wells**, vice president of IT for Toot'n Totum, reminisced on previous Conexus presentations that helped him get started.

Allen echoed the NRF example and initiatives like the Retail AI Council, which is helping push AI awareness across different industry segments.

“When I looked at everything I found, I would say AI and retail is still in its infancy, and I don't think that's bad. I think that's very typical of a lot of technology when it comes out.

***Randy L. Allen**, Senior Lecturer, Cornell SC Johnson College of Business*

Helpful links for events and councils mentioned in this section:

Retail AI Council

NRF 25: Retail's Big Show

NACS Show

Conexus Annual Conference

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Challenges for Smaller Retailers and Partnering With Vendors

Peters focused in on why AI is viewed differently from the C-suite down to the operational level explaining that while larger organizations might have dedicated teams for business innovation, smaller retailers often have limited resources and therefore lean on third-party vendors for AI solutions. Peters noted that smaller IT teams, like within his own company with 62 locations, are frequently focused on “break-fix” issues and may not have the capacity for large-scale AI implementations without external help.

The cost of AI, in terms of research and development, is a significant barrier for smaller players, as well. Rhoads and President of 37-store Robinson Oil Corporation **Erin Graziosi** voiced similar concerns to Peters. Graziosi pointed out that implementing AI remains a significant challenge when you have limited bandwidth and expertise.

Rhoads, representing an eight-store chain, admitted that while their vendor partners are exploring AI, his company hasn’t moved forward with any AI-specific projects.

A recurring theme throughout the discussion was the reliance on vendor partnerships to implement AI solutions. Many, like **Bill Ridge**, VP of technology at Eastern Petroleum Corporation, agreed that smaller retailers often look to vendors for technology solutions, waiting for them to develop and offer AI tools that are practical and cost-effective. Collins highlighted that while AI is currently a “cool” technology, it hasn’t yet become a must-have tool for store managers and those working on the ground.

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Use Cases and Practical Applications

Several practical AI use cases were discussed, including training, marketing, and improving store operations. Stillman was particularly excited about AI tools embedded in digital marketing solutions that could help retailers respond to customer reviews.

Allen and **Jeff Carpenter**, director of education and training at Clifford Fuel, expanded on the importance of using AI for improving employee efficiency and customer experience. Allen noted that while AI could help train employees and reduce the time spent on mundane tasks, it also freed up workers to focus on tasks that could improve margins and customer service. Carpenter added that while throwing more labor at operational issues is one approach, AI offers an opportunity to enhance the overall customer experience more efficiently.

Some members offered specific use cases of AI applications within their organizations. Bajimaya shared how his company implemented AI by creating a data lake that provided daily reports tailored to different roles, like district and loyalty managers, offering insights on sales and margins. Wells brought up his exploration of computer vision AI for store operations, such as ensuring wet floor signs are placed during mopping. However, he noted that

such solutions are either too expensive or not fully developed yet. Rhoads has used AI in helping with online presence and social media management.

On the other side, **Jeffrey Harrison** co-founder and president of R overtown, offered caution that some retailers are still struggling with basic marketing efforts like taking high-quality photos or producing simple video content. He suggested that eventually, AI could unlock new creative marketing opportunities for convenience stores, allowing them to tell their brand stories more effectively.

Expanding the View

In line with all this discussion, VGN co-founder **Myra Kressner** announced Connexus Vision Group (CxVG) is launching in November of 2024. The goal of the group is to elevate Connexus' engagement with CxVG's c-level retailers and suppliers which may lead to innovations and standards creation or similar activities within the purview of the Connexus mandate. VGN will produce CxVG Vision Reports to capture all of the meeting ideas, providing authentic context and transparency.

Final Reflections

The transition to 2D barcodes will present retailers with the most significant change to a process that very few operators have experienced in their lifetime. With the leadership of GS1, retailer technologists, and collaboration with vendor solution providers, there will be a smooth transition to the new technology. Customers will benefit from the increased information available, and retailers will realize more efficient inventory and supply chain management.

AI will also continue to push the needle in retail, assuming retailers use it thoughtfully. While retailers remain cautiously optimistic about AI implementation, the continuing analysis by Cornell's SC Johnson School of Business will certainly help make the path forward clearer.

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LIGHTNING ROUND **Review**

During a fast-paced Lightning Round in the September 13, 2024 meeting, CTVG members and guests reflected on the topic of retail media networks (RMNs) which was discussed at CTVG's June 2024 meeting. At that meeting, Kevin Struthers of Axonet and Doug Baker from FMI discussed the emerging trend of RMNs and emphasized their importance for convenience retailers looking to scale and monetize their data. CTVG members reflected on new activities in their organizations and learnings from industry events.

Still Gathering Information

Bill Ridge expressed uncertainty about whether his smaller retail operation is ready for a RMN but mentioned it is focusing on video and audio upgrades in their stores. He anticipates future opportunities for AI-driven advertising based on customer identification.

Likewise, **Raymond Huff**, president of HJB Convenience Corp recently attended that same Conexxus conference and highlighted a start-up, InStore.ai that uses AI to gather insights on store operations. He also believes that RMNs are about personalized advertising rather than just visuals.

From the vendor perspectives, **Rick Sales** was skeptical about the practicality and ROI of RMNs for most retailers, suggesting that RMNs for many retailers is questionable due to the focus on brand experiences rather than direct product advertising. **Jeffry Harrison** echoed that smaller chains may struggle with RMNs individually but can achieve success through collective efforts, based on some experience he has with RMNs.

Maintaining Control and Data Integrity

Steve Evans, chief technology officer at Haffner's Energy North Group highlighted

the importance of maintaining control over in-store advertising. His team focuses on using their limited advertising space to promote their own brand, aligning with vendors where possible to strengthen messaging. Similarly, Sales noticed that brand messaging, rather than consumer packaged goods (CPG) ads, dominated effective digital advertising strategies.

Guest **Lori Stillman** emphasized the importance of first-party data in driving RMN success, encouraging smaller retailers to focus on organizing and leveraging their own data as a first step before joining larger RMN initiatives. Harrison also believes data is important, citing Altria's transition from tobacco to data-driven products which presents a strategy that could serve as a model for other CPG companies looking to leverage RMNs.

Download the June CTVG Report, ***Retail Media Networks: More Than Meets the Eye***, to read the full presentation and discussion

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NOTABLE AND QUOTABLE

On Sunrise 2027...

“ I will say that I want to make clear, come 2027, the power of 2D barcodes as we have said is that [they] can encode additional data that can open up all of these use cases. For 2027, all we're really looking to do is extract the UPC and go beep. That's the only requirement of the retailer...As you get additional data in there, it's more than just a scanner upgrade in order to ingest the lot batch code and do something with that.

Gena Morgan, Vice President of Standards, GS1

“ There's a lot of work to be done on the software side. And for a lot of retailers, my guess is they don't even have the right hardware in place to be able to scan those barcodes. So, there's going to be an investment and it's going to be kind of a slow adoption, I think, over time, but the benefits are really tremendous.

Bill Miller, Vice President, Head of Sales, GK Americas

On Retail Use of AI...

“ For everybody, employee efficiency is the biggest benefit that people are getting today. So, there's been a lot of talk that this is going to get rid of people. Right now, it's not getting rid of people, it's just making people more efficient and more effective, which is I think very good.

Randy L. Allen, Senior Lecturer, Cornell SC Johnson College of Business

“ We certainly want to personalize more than we are, not that there's zero personalization today, but there's great opportunity in the future to personalize them more.

Erin Graziosi, President, Robinson Oil Corporation

“ We're going to wait for our vendors to really bring this to us. I think that's when you're going to see the leap into the retail space is when the large vendors in this space are offering this and have packages that this is useful.

Jason Collins, Director of IT, Englefield Oil Company

“ I think I can explain the C-suite and the VP to director kind of disconnect that you kind of saw in your data. And what I can really attribute that to is really I think the C suite, they're more breadth, less depth, so they tend to have to be future thinking...I think some of the more pragmatic, a little bit more, I don't want to say negative, but less optimistic is really around a world of IT teams that are in a world of break fix.

Nick Peters, Vice President, IT, Campbell Oil Company

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VALUABLE RESOURCES

The quantity of materials on this topic would make for an insurmountable pile. To help you navigate through the masses, here are resources worthy of making your “must-read” list.

As we were publishing this Vision Report, Randy Allen provided us with two additional pieces of information:

- [AI in Retail Research Report](#)
- [A comparison of convenience retailers to general merchandise retailers](#)

Both of these valuable documents are located at the end of this Vision Report. You can access them by clicking on the links above.



Ed Collupy, Facilitator

It is always great to expand our horizons and with our September 2024 CTVG meeting, we did just that with two evolving topics – the transition to 2D barcode technology at the point of sale and the fast-moving use of artificial intelligence in retail. We didn’t specifically link the two topics together but there is research and innovation in uniting barcodes and AI.

In this recent blog posting by Barcode Factory, [“How AI is Transforming Barcode Scanning”](#), it opens up even more possibilities beyond our discussion of GS1’s Sunrise 2027 initiative. As I read the post, I saw opportunities in areas such as reducing out of stocks, enhancing the consumer experience, and providing further efficiency at checkout. Honeywell takes things even

further, discussing “invisible barcodes” and “machine learning,” in a look back and ahead in their posting, [“The Barcode Revolution: Past, Present and Future.”](#) Having been involved with the UPC barcode from its infancy and watching it mature, I’m amazed to watch how, like me, it’s being ‘rewired.’



**Myra Kressner,
Vision Group Network
Co-Founder**

I had the pleasure and privilege to attend [RetailROI Super Saturday](#) this past January 2024 during the NRF Show, a heartwarming and extremely informative event. At that time, I heard about Sunrise 2027 for the first time and the 2-minute video about it from John Phillips, SVP customer supply and global go-to-market with [PepsiCo](#) got my attention.

Additionally, in my Valuable Resource for the April 2024 report “CTVG Fighting for Tomorrow’s Customers,” I called out the concerns from Cambridge Energy Research Associates and companies like Microsoft and Amazon’s about “AI’s insatiable appetite for electricity.” In September 2024, Microsoft signed a major deal with nuclear plant operator Constellation Energy to buy power for its data centers from the energy company’s Three Mile Island Unit 1 nuclear plant. “The data centers that train the large language models behind AI consume unimaginable amounts of energy, and the stakes are high for big tech companies to ensure they have enough power to run those plants. That’s why Microsoft is now throwing its weight behind nuclear power.” Read more in this TechCrunch article, [“Microsoft taps Three Mile Island nuclear plant to power AI.”](#)

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Presentations



Ed Collupy
CTVG Advisor/Facilitator
and Principal, Collupy
System Solutions LLC

CTVG

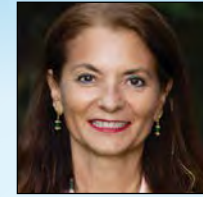
CONVENIENCE TECHNOLOGY
VISION GROUP

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Nick Peters
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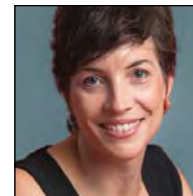
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IN THE ROOM WITH CTVG:

*Technology ABC & D's:
AI, Barcodes,
Convenience, & Data*



Convenience Technology Vision Group (CTVG) invites you to join us **In The Room** to experience our meeting on September 13, 2024. We are providing you with the entire conversation so that you can be “in the room” with us, rather than simply reading polished sound bites.



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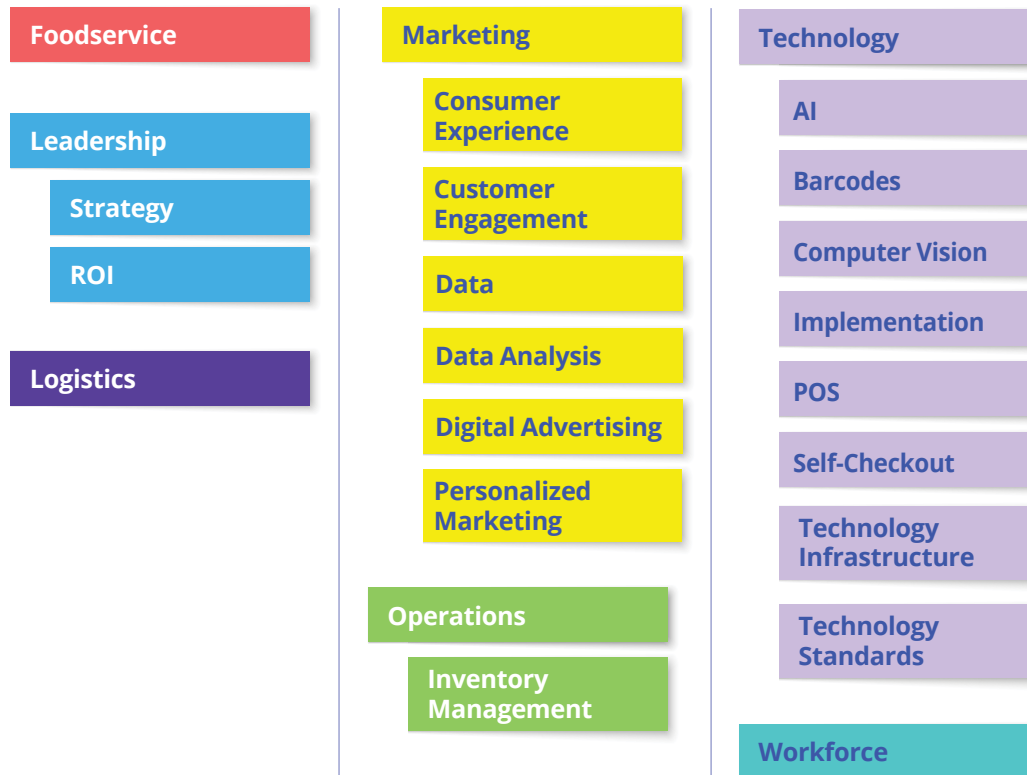
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Topic Reference Key

CTVG's mission is to increase the institutional knowledge of the retail industry by sharing ideas and perspectives. For your convenience, we have placed topic indicators throughout the dialogue. Below is a key to the list of topics.





Ed Collupy

Welcome, Introductions, Meeting Rules

Welcome everybody. Ed Collupy here. I'm glad you're joining us for our latest Convenience Technology Vision Group meeting. Today, we're going to try something new with two topics. So we'll first hear from folks from GS1 about Sunrise 2027, the transition from the just turned 50-year-old UPC barcode to 2D barcodes. And then we'll follow up on our discussion back last December, hard to believe, on AI. And we'll hear some insightful results from a survey of senior retailers from across many segments of retail, including convenience. But most importantly, this afternoon will provide each of you with the time and opportunity to share your thoughts and insights. And I'm just going to share something to get us started.

Just as a review, at each of our meetings, we show this screenshot reminder [antitrust statement is shown on the screen] that outlines the antitrust statement and publication acknowledgments that every member and our guests have signed. So that takes that formality out of the way. And we are recording this discussion. Just a couple other reminders. Please use your camera and keep it on as much as possible. And remember to keep your audio on mute, unless you are speaking, so we aren't disturbed by any activity that's going on around you. And also, please ensure that we have a frank and diverse discussion. If anyone wants to make off the record comments, just let us know that what you're about to say or what you have said is off the record. We also miss our members who had other things come up. They've asked me to extend their greeting to you all, and they'll miss being part of today's discussion.

And in particular, Roy and Eva Strasburger who are co-founders of the Vision Group Network aren't with us today. They're celebrating Eva's mother's 90th birthday. So we wished her mom a happy birthday. And I guess speaking for myself, I hope I get to 90 as well. I'm also excited to welcome some new CTVG members today. These folks come from all over the United States and represent a variety of different roles in their companies. Happy to have Sanjit Bajimaya, who's the IT director at Loop Neighborhood Market, join us. Jeff Carpenter is the director of education and training at Clifford Fuel. Abhi Patel is the director of information technology at Nouria Energy, and I was fortunate enough to spend some time with Abhi this week at one of my study groups. And then Emily Sheetz from Sheetz is joining us. She is the vice president of strategy and IT.

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Sanjit Bajimaya

Ed Collupy

Sanjit Bajimaya

And also Sharif Jamal from Chestnut Petroleum Distributors who may join us late, but he will be certainly joining us at future meetings. So welcome to you all. I'd just like to go around to the four that are with us to welcome you and let you have a chance to give just a quick introduction of yourself and your company. So Sanjit, do you want to lead us off?

Sure. Thank you for having me, first of all. I'm Sanjit Bajimaya, director of IT for Loop Neighborhood. This is my 14th year with the company. I'm happy to be here in this group.

Where are your stores located, just so folks know.

We're in California, mostly northern California. We have scattered locations all over California, but more concentration is on northern California, San Francisco-Sacramento area.



Ed Collupy

Jeff Carpenter

Very good. Jeff?

Good afternoon, everybody. Hailing from Cliff's Local Market in upstate New York. We have been in the business since 1961, many years as a Nice N Easy Grocery Shoppes franchise and rebranded to Cliff's in 2017. And pleasure to be with you all.



Ed Collupy

Emily Sheetz

Excellent. Thanks. Welcome. Emily?

Good afternoon, everyone. Emily Sheetz from Sheetz Convenience Stores. We just opened our seventh state here in the mid-Atlantic region. Very happy to join you. I believe my cousin Joe was a part of this group before, and hopefully I'm able to add as much value as he did. Thanks.

Ed Collupy

Emily Sheetz

Joe's a member of the Convenience Leaders Vision Group.

Right.



Ed Collupy

Abhi Patel

Thanks, Emily. Abhi?

Hello, everybody. This is Abhi Patel. I'm representing Nouria Energy. We are in the New England region, located in Massachusetts, doing business in five different states from Maine to Connecticut. I'm overseeing the IT operation for Nouria Energy, and I'm excited to be in this first meeting.

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Ed Collupy

Excellent. Well, thanks all, and we're really fortunate to have such formidable leaders joining us in our conversations, and I'm sure we're all going to benefit from your experiences and outlooks. And I don't think Sharif joined. So we'll catch him the next time.

I'm going to just quickly introduce our guest speakers and guests that are with us this afternoon. Gena Morgan who is the vice president of standards at GS1 US is with us. Liz Sertl is the senior director of supply chain visibility at GS1. Randy Lee Allen is a senior lecturer at Samuel Curtis Johnson Graduate School of Management at Cornell. She's in the College of Business. And then Lori Stillman is with us from NACS, who introduced us to Randy Lee Allen. Thanks for joining us as well today, Lori. And we'll come back to our guests in just a minute. But as a reminder, as we get underway, please use the raise hand functionality, the icon that's in the teams meeting, as often as possible for conversation flow, unless members are clearly in a back and forth discussion. And if you do need to leave today for any particular reason, jump off for a few minutes or whatever, you can either just write a note in chat or just leave and return when you're able. So let's get started.

Lightning Round Review

Digital Advertising

During our June meeting, we heard about **retail media networks**, and we heard from a couple of insiders, Kevin Struthers from Axonet and Doug Baker from FMI. And we learned quite a lot about that **emerging tech trend across the retail industry**, and how it will be important for convenience retailers in particular to find ways to scale and aggregate their data in order to capitalize on the incremental monies available from consumer packaged goods companies. And then in our latest Vision Report, "Retail Media Networks More Than Meets the Eye," we depicted what we learned, and answered many questions, and it provided all of our members an opportunity to share your thoughts.

And since that meeting, just three months ago, where we highlighted this new business opportunity early on for the industry, there've been some **new announcements**. Giant Eagle supermarket and their convenience chain GetGo announced -- just ahead of the Circle K announcement to acquire GetGo -- that their Leap Media Group will join a data and media network company. So, an example of that kind of aggregator company that both Doug and Kevin spoke to us about. And then Hy-Vee, who operates the Fast & Fresh convenience stores, announced the hire of a former advertising industry executive to lead their focus on their RedMedia retail media network and other marketing initiatives. Smaller

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Bill Ridge

Strategy

Personalized
Marketing



Ed Collupy

Raymond Huff

Ed Collupy

Raymond Huff

Personalized
Marketing

food operators continue to join and leverage Instacart's Carrot Ads, another way of aggregating. And then even outside our own retail segment, Home Depot rebranded its RMN from Retail Media+ to Orange Apron Media.

So lots of investments, lots of new types of people coming into roles in the food industry, whether it's supermarkets, grocery or convenience, as well as just these moves really committing to spending time and money and looking at that opportunity. So as part of our Lightning Round, for anyone that was on our call last time, or who may have read our Vision Report, I'm wondering, have you done anything or been talking about it with your own company and initiating any moves into the retail media network arena? And then there is a conference coming up at the end of this month called the Retail Media Network Forum. I was curious if anyone is attending that. And then just any thoughts that you have on retail media networks since our meeting? So anyone want to get us started on that? Bill.

Yes, I'll just say, as a smaller retailer, **we have talked about it, and we're not sure it's ready for us yet or we're ready for it.** But that being said, we're in the midst of two major remodels and a new store. And our thought process on video and audio has gotten more extensive, because where we're going to put video in the store now, probably put more of it, that combined with where we put cameras. And for the main reason that with AI and where it's going, we may have an idea of who's in the store just from [the cameras]. That may be a while in front of us, but we may be able to **run ads or whatever on that video based on who's in the store.** So still, we're thinking that whole process through and **getting these stores ready** for that just in case that moves a little faster than we think it's going to be. That's just my one comment.

Yes. No, very good. Other thoughts? Ray, did you have something?

Okay. I just left a Connexus Conference in Twin Falls. We had a large presentation by a retail media company. I don't know that my stores are ready for it yet. I'm still trying to get customers back into the office buildings. By the way, it's about 50% better than the last time we talked about it, so it is getting better.

That's good news.

It is good news for us. But the one thing that I got out of the conference and what was presented is it is not all about just putting something in front of the customer's view, but it's **sending them personal ads**, 8112s. There's a lot of things that go into it. And there's a new startup that I saw at one of the conferences, InStore.ai, I think it's called, that uses audio to tell you insights about the stores that you would never guess. So technology is using AI at the speed of light there, and it's really going to help us, ultimately, be better operators.

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*Note: The new GS1 **coupon** application identifier **8112** was created to provide the coupon industry with a retailer-agnostic digital **coupon** format. The 8112 coupon standard is a modern, secure, and universal couponing system that uses real-time validation to improve the experience for both consumers and retailers.*



Ed Collupy

Rick Sales

Digital Advertising

Strategy

Very good. Rick Sales, I saw your hand up.

Yes. Thank you. And happy Friday to everybody. After the last meeting, I made a note to go and meet with my creative team and just get an overview of what the media mix our clients were putting out there, because I had a perception of what that media mix was. And after the RMN discussion, I wanted to look at it. And it wasn't like I expected. The vast majority of people that have what I consider to be a valid and effective advertising program in their stores, digital advertising program, the **brand messaging is the king** of that messaging. It's not the CPG (Consumer Packaged Goods) ad. In fact, the CPG ad is what we used to do in the late '90s and the early 2000's. That was really very popular in the media mixes, and it's not very popular today. **It's brand messaging, it's program messaging**, like "join my loyalty program", and it's food service messaging and other high margin, high value strategic programs like a beer cave and things like that.

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Strategy



Ed Collupy

Steve Evans

Strategy

Ed Collupy

So I had a little bit of a concern about the compatibility of the CPG objective, which is understood to really sell more product and to understand the consumer better. And the retailer objective, which as I understand it today as a digital signage provider, is to **create an experience in the store** that will get that consumer to embrace the brand and prefer the brand and focus them on some things that they want them to act now. So it is possible that size matters and they may be in a more advanced strategy to take advantage of RMN, and that's why the larger players have it, but I think that for the average retailer, the value of the RMN is still not understood beyond getting somebody to pay you for some advertising. And I think 10 years ago we defined that as being not strategic or super successful for the operation of your store.

So I can understand why the adoption has been as it has been. And we looked at this product for many times. And Abierto strategically, what we've decided to do is we have all the exposure data. The proof of play data, we have it. So **our goal is to provide the proof of play data to our customers and to their RMNs and provide other exposure data**. And customers who have invested in their data warehouses and all these processes can incorporate it with their sales data, but we don't see how this has a lot of legs in smaller retailer programs from our perspective. So just wanted to share what we learned from media mix and looking at this question.

Super. Thanks, Rick. Steve Evans.

I was just going to jump on a little bit what Rick was saying. For us, it's control. So we don't have necessarily enough screens or impressions to sell to really move the ball if we just sell it out there to advertisers. [Strategy] So for us, as we've been looking at how do you use little advertising space when you get the customer inside the store is really about what Rick was saying, it's pushing our message. And **where we can interweave the vendors or the CPG providers into our message, that's where we think it's going to be most effective**.

Very good. Thanks. Anybody else? I think it's going to be really interesting to see how things continue to evolve with RMNs across the convenience mobility industry, given the diversity and company sizes and that need to scale. There'll be more on this topic at the NACS show as well. Sharif, one of our new retail members to CTVG, his colleague, Abigail Cerra, from Chestnut Market, is going to be on a panel discussing this topic. So it'll be interesting to hear what they have to say. Jeffry, go ahead.

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Jeffry Harrison

Strategy



Ed Collupy

Lori Stillman

Data Analysis

Strategy

Jeffry Harrison

Strategy

Thank you. I just wanted to add, we'll also be speaking with RaceTrac and with Jeannie Amerson from Enmarket on the topic of creating irresistible promotions at the NACS Show. I believe it's Wednesday morning there but check that out too. We're going to be talking about retail media networks as well. And obviously an important topic, as everyone pointed out astutely. The **independents and the smaller regional chains don't really have the firepower to get these deals done individually, so collaboratively, we're working on that** with a couple ideas with the app side of it, so excited to share that on stage next month.

Super. Thanks Jeffry. Lori.

If I can, I'll just add one thought. What I don't hear anybody's talking about though is the **importance of the first party data**, right? That's really the **fuel for retail media networks**. And so for those of you who are saying, "It's not for me right now," what is for you right now is to really **get that first party data in order**. So as opportunities for aggregators and others come into the space, I think you're going to be able to really drive and be much more effective. And Jeffry, I know you're much more intelligent on that topic than I am, but I just didn't hear anybody talking about first party data. And I think that's **the real beauty behind the success** that some of the larger players are enjoying with their retail media networks network.

Yes, just to echo on what you said. Sorry to come back, Ed, but I will say there's one CPG company out there that's doing this the best right now. And we all know it because they all give us funding for it. It's **Altria. They've got a real master plan**, and we've learned a lot more about it in the last 30 days. It's very interesting. **They're going to become a data company**. They're not going to sell tobacco products anymore. They're going to sell smokeless products, but they're doing it -- they're laying the groundwork for all the other CPGs.

Sunrise 2027 Presentation

Ed Collupy

Interesting. Thanks, Jeffry. Thank you, Lori. Anything else on this for our Lightning Round? Okay, we're going to move on to our first topic today. So a couple of weeks ago, and I'm going to be completely honest here, I got up at five A.M., which is completely not me. And it wasn't to see the sunrise, but it was to see the International Space Station go by. But as I watched how fast moving that shuttle passed by, the sunrise was kind of moving at its normal methodical pace that it

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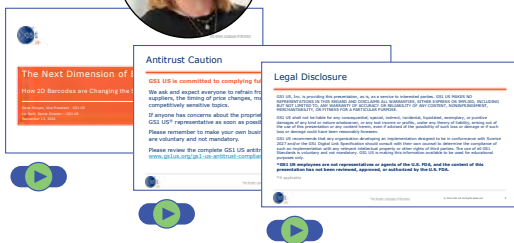
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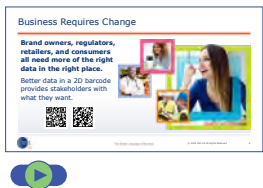
Technology Standards



Gena Morgan



Liz Serti



does every day as long as the clouds aren't blocking it. But it was then that I realized that the name to the GS1 Initiative, Sunrise 2027, was spot on. The change is a transition. And as you'll hear from Gena and Liz, it's not a sunset.

The sunrise of the **new 2D barcode is really going to provide new benefits to lots of stakeholders**. And they're retailers, they are solution providers, they're the consumers, the packaged good companies, other tech companies, and many more stakeholders in this whole arena of bringing about this transition to Sunrise 2027. The UPC doesn't all of a sudden go away. And the full potential of Sunrise 2027 is going to come over time, not on the magic date three years from now, but a progression and a transition. So I'm excited to learn more about this from Gena and Liz, and they're going to take us through what we should be thinking about and what we should be planning for. So with that, I think Gena, you're going to lead us off.

Great. Thank you so much for having Liz and me here with you. As Ed mentioned, my name is Gena Morgan. I am the vice president of standards at GS1 US. For those of you who are not familiar with us, we are the standards organization that administers the UPC code. So globally, unique identification is the core of what we do, but we also develop standards for automatic identification, data capture, so barcodes and RFID tags, as well as standards for data sharing, including master data, EDI, and physical event data. So that's our brief intro there.

Here's a word from our lawyers, and then I will turn it over to Liz to get us started on talking about Sunrise 2027 and 2D barcodes.

Awesome. Thanks, Gena. So Ed, I'm now visualizing you watching the sunset thinking about barcodes, which is, I don't know, pretty impressive. So as you said earlier, the barcode, the 1D barcode that's on every product to make the scanners at point of sale go beep, was invented 50 years ago, and it's been a really great thing. But we know that business requires change, things evolve, and retailers, you all know, you need to improve safety, quality, freshness, inventory, all these things. FSMA 204 (food compliance regulation) and regulations are coming, which we're not even going to get into in a huge amount of detail today, but there's the need for increased traceability, sustainability, and consumers are asking for more and more data. And that just gave the industry this move to what's next. We have this 1D barcode. What could be next to help us move towards all of these different needs in business?

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Technology



Data Analysis

Customer Engagement



Data

Gena Morgan

And that brings in Sunrise 2027. So Sunrise 2027 is an industry set milestone. It's not something that GS1 said, "Okay, 2027 sounds good." Industry came together several years ago and said, when do we think we can start moving towards a date where at the point of sale, a 2D barcode can be scanned, and a GTIN, a global trade item number, which is that UPC number that everybody's familiar with, can be taken out of that, and then the scanner goes beep. So a roadmap was put together, a ton of research was done, and it gives us all this **date of the end of 2027 to rally around for that software capability and hardware to go beep with a 2D barcode.**

We're going to get pretty in the weeds. Gena is way better at the weeds than I am. But from a business perspective, this wasn't done in a vacuum, and I just want to kind of level set that it wasn't arbitrary. So if you move thinking about not just the U.S., but this is also a global migration to 2D. We don't call it Sunrise. It's Ambition 2027 globally, but everybody has said yes. The 1D barcode worked, but what's next? So you'll see, as you talk to folks around the world, that 2027 is something that everybody is marching to, and the brands are aware as well. And let's talk about the different use cases.

So when you start thinking about what information can be encoded into a 1D barcode, it's very simple. When we're talking about something that's on a can, it's just that product identifier.

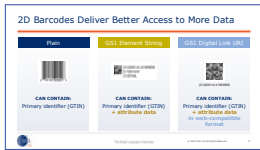
But when you start talking about additional use cases and what kind of information can be put in a 2D barcode, you start thinking about things like more granular inventory management. You can **manage information** by expiration date for freshness, and also reducing waste, sustainability because recycling information, and then a waste prevention, again, traceability, sourcing information, consumer engagement, we were just talking about retail media networks. How do you **engage those consumers** more? And if you're scanning a barcode and it has a story about a product that was manufactured in whatever state with this really cool background to it, you can draw folks in in a different way. Improved packaging. I used to work at a big CPG company, and we would always fight over the race, the NASCAR on the cans of soda. So being able to go, eventually.... like Ed said, it won't be immediately, but to have some different kinds of options with packaging is really powerful. Gena, I will let you dive into the specifics of 2027.

All right. Thank you, Liz. I think just to piggyback on what Liz was saying, there are just more **demands for more data** about the product that needs to be served up in a different way, and that's via the 2D barcode. What a 2D barcode provides you is the capacity to **put more data in a code**, and sometimes with a much smaller footprint to do more things. And so let's just get started.

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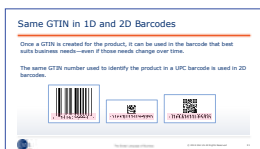


Inventory Management

Technology Standards



Data Analysis



Our 1D OG, I call it, barcode, the UPC, as Liz said, it just contains the GTIN. And I say just, but it wouldn't have been around for 50 years if that was a just. It does go beep at the point of sale, but it also does **allow you to manage your inventory in some different ways** that we can capture information. But it's only at that kind of product level, what is this thing.

With 2D barcodes, you can pack some more information in there. And so there's a couple of different ways that you can do that. You can put in what we call the GS1 element string, and what that really is application identifiers, which tell you what the scanner is about to read. So I'm about to read a GTIN. I'm about to read a batch lot, I'm about to read an expiration date, and those all come just in a string of numbers, and scanners can read that today, by the way. But then you can also put it in a syntax that allows you to additionally add more data, but add it in a web-resolvable format. So unlike the UPC, which is just a string of numbers, or even an element string which is just a string of numbers but with some intelligence built-in, so you can put more information about the product into it. This one, a **2D barcode with what we call our GS1 digital link standard, allows you to take that product identifier, possibly append it with some additional data and put it in a structure that's web-resolvable, that becomes extremely powerful.**

Now, just kind of to dive in into this syntax options, all three of them are based on the same GS1 identification elements, the different formats is what enables different capabilities. And even though additional data beyond the GTIN can be encoded, again, GS1 digital link and this syntax here is the only one that can really support consumer engagement, because it's web-resolvable. This structure is of course what is used every day when you surf the web. It's just a URL. But it is a URL with a particular standardized structure, again, so a scanner could see this and go, "I'm going to extract that UPC code and I'm going to go beep," or if I'm really powerful, "I'm going to extract that UPC code, I'm going to extract that lot number," and "Oh wow, I'm not going to let this consumer walk out of here with a recall product," perhaps. Because now with 2D barcodes, you're able to **identify things at a much more granular level** and so it just opens up those use cases that Liz mentioned.

Now, once a GTIN is created or a UPC is created for the product, GTIN is our inside language, I will admit it, but it is a global trade item number and it comes in different lengths. It can be used in the barcode that best suits the business. It may be that you don't need consumer engagement and you don't need any additional data and that OG UPC works great for you, but that same GTIN can also be used to identify the product it should be in a 2D code. So this is just the GTIN represented and the different formats of barcodes there.



Barcodes

Consumer Experience



Strategy

POS

The 2D barcode options for retail products, again, include this. I'll just give you a little bit. There's two types. **There's a data matrix and there's a QR code.** The QR code is the code that we are most familiar with, but a data matrix has a little bit of a tiny, smaller footprint in it just because of the way in which the barcode is put together.

So again, you can have a GS1 data matrix with a GS1 element string. It's a data matrix barcode, again, with just that string of numbers and application identifiers. You'll see that on a lot of pharmaceutical products, regulated products where that was actually written into the law that you needed to have GTIN and a serial number and a lot of code and the chosen barcode was a data matrix. Again, just a string of numbers. Once again, the QR code with digital link. So this is the best one for consumer experience, and I'll tell you why in a second. You can then have a data matrix with GS1 digital link as well. Both of these are the ones that can help you resolve to different types of data and **they can both support a consumer experience.** The reason why we say the **QR code is the best for enabling a consumer experience is it's the one that can be natively scanned by all mobile phones.**

So that is really the differentiator between a data matrix with GS1 digital link and a QR code.

All right, so key points on barcode options. If I'm a CPG brand or I'm any brand, I just decide which code makes the most sense for me. As I mentioned, there are some regulated healthcare products where you've got to use a data matrix and you've got to use a GS1 element string with just that string of numbers and application identifiers. I could have some very small products. I'm thinking, I'm trying to relate this. I could have a pack of cigarettes that maybe a data matrix with GS1 digital link in it is a better option because it's a smaller footprint. It's only millimeters smaller than, maybe even less than a millimeter smaller, than a QR code in most instances. But that's just **a matter of what the different decisions you need to make about your packaging on whether or not you choose a data matrix or a QR code.**

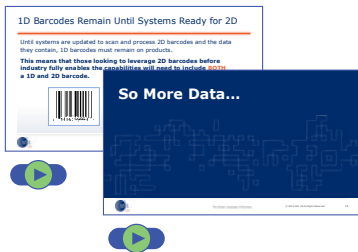
So it really is up to the brand on a couple things. A, do I want to move to a 2D barcode? And that's where you walk through those use cases that Liz mentioned to say, "What am I trying to do here and how do I want to engage with my consumer? Or do I just really need to comply with a regulation?" It's really up to you or up to a brand. Now for the retailers, and this is the Sunrise 2027 part, you **have to be able to scan any barcode** that comes across any of these three barcodes that might come across your point of sale. The UPC code, that's the original one, so there's actually four. The GS1 data matrix, a data matrix with GS1 digital link or QR with GS1 digital link. Those all have to be able to be passed **across the point of sale**, the scanner recognizes what it's looking at and then serves the information up to your host system.

CTVG Views

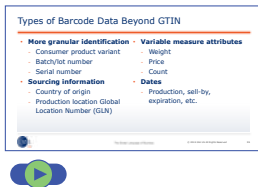
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Presentations

Barcodes



Technology Standards



Liz Sertl

Data

But that is the gist of what 2027 is for the stake in the ground, I should say, for what retailer capabilities need to be. Now one barcode, the 1D barcode as Ed mentioned, is not going away immediately. We understand, some of us more than others who've been in standards for their entire career, it's a journey and it takes a while for this to gain ubiquity, and so **national brands will likely have both the UPC code and a QR code or a 2D code on their product at the same time.** They already do, to be honest with you, if you look at most CPG products, there's a UPC code and there's already a QR code on there. And so you might say, "Yeah, this has already happened today, Gena, what's the difference?" The difference will be that QR code again, will have that digital link syntax which allows you to do all your supply chain activities and engage with consumers. The long game here is you have **a single barcode that does it all.** If I'm a retailer with private brand product and I'm not worried about whether or not my retailer down the street can read it, I could move to the 2D barcode tomorrow. As soon as my scanners are capable of reading that, I could move to just a singular barcode for my private label products and drop the UPC code as soon as we can scan it.

Again, **1D barcodes will remain until all systems are ready for 2D.** But it doesn't mean let's wait, and we really believe that folks need to start preparing for what that future holds. All right, so I've talked about more data. **A 2D barcode is required when you move past more than a product identifier in a barcode.** QR codes are on products today and they have just your basic URL that takes you to a web page. What we are saying now is, if you take that and put a standardized syntax that includes the product information in it, plus some additional valuable supply chain information, you can do more stuff. Liz, take it away.

So I already kind of touched on this, but just wanted to bring up a couple very specific **examples of the kind of information that can be encoded in a 2D barcode.** So consumer product variant, if you are thinking about a holiday pack, so if you want to be able to track how many things you're selling that are as a fall versus a winter flavor, for instance, that's the kind of information that can be encoded into the 2D barcode, something like a serial number. So right now Gena talked about a recall and we know that there could be a brand with a production date, and some point of sale systems are able to say, "Oops, there's a problem."

But imagine if you could get down to a batch lot or a serial number, especially when we talk about food safety. It's just really powerful. And like Gena said, some brands may be putting this into it and some may not. And then from a retailer perspective, they may be putting a ton of information in here and you don't want to be able to ingest all that data and that's fine too. And you start thinking about other things like country of origin, which you may care about as well as a

CTVG Views

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Presentations

Data



Gena Morgan



Customer Engagement



Data



Consumer Experience

GLN, where that's a global location number. So similar to a GTIN, it's the globally unique identifier for location. **All of that information can be put into the 2D barcode as well as variable measure attributes and dates.**

And so here's what it looks like you guys, all of that additional data you have, I don't know how much this group uses, what we call the GS1-128, but those are case labels that tell you what's inside this case, what's the expiration date, what's the batch lot number? And there's what you see in a linear 1D barcode with that type of rich information in it. This is the same information in those different footprints that we talked about. So you can see even logistically how you can begin to leverage the power of what a 2D barcode can put into it and limit the size there.

Now I'm going to switch directly to the **value here of where consumers can now engage directly with the package.** Part of the move here from a 1D barcode, which listen, consumers can engage with if I'm in an app on my phone and when I do engage with, I might scan a 1D barcode in an app with my phone, the quality of that data may depend if I'm in a fitness app, it just depends on who crowdsourced that data and it's not really always that great. But here where you have a 2D barcode that is web resolvable, remember, and a structure that has the product identifier and its web resolvable, consumers can now engage directly from the packaging and be linked to a **plethora of information or stories about that product.** I might just land on the product page, but depending on what's in that barcode and some of the redirection services I could be brought to traceability information, country of origin information and things like that.

It looks like this. So the **barcodes hold data for systems to act on** and that data can start with just the product identifier or add on additional pieces of information that really make things go. The standardized GS1 data in the barcode identifies the product, and where the barcode data takes you can change without changing the barcode now. Because I might have this encoded into my QR code and it takes me to a product page. But tomorrow I might decide I want to take it to a different experience and you can do that without changing what's encoded into that barcode, and that's the power of the web resolvability and the power of GS1 digital link.

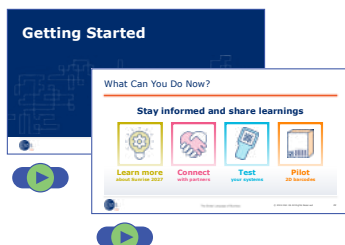
You could see here like a URL, just any old URL, can be redirected to this webpage. I could have a QR code that's not using GS1 standards. It can be redirected to this webpage.

Same thing here, QR code with GS1 digital link. You can see the GTIN in there, it can redirect there. That's really the power of taking a string of numbers and then providing a **standardized syntax that then takes you to an experience** that the brand controls.

CTVG Views

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Presentations



Liz Sertl



Now, additionally, there can be some things like, based on this QR code and where it resolves me to and also potentially where my phone is or where I am in the world, it can serve up an experience in my native language. It could say, “Oh, it’s this time of day, let me give you a recipe for this product that you might enjoy.” Or based on whether I’m in Ohio or I’m in Maine, I can be served up a particular recipe. So again, this is all about web resolvability and being able to have linked data from a simple mobile scan that really unlocks the power of 2D barcodes and what they’re able to do and **the stories that they’re able to tell.**

And that’s the why a lot of private brands and national brands are moving to 2D barcodes, but that doesn’t mean that retailers can’t benefit from it as well.

I’m going to skip just in the interest of time.

We have a number of different slides here on how to get started, but I wanted Liz to be able to have enough time to touch upon, “Okay, I think I understand you. 2D barcodes are going to replace the UPC code and we retailers need to be prepared to scan that and serve up a UPC like it does today. What else might it be able to do?” So here’s some of the things that also will be in the slides that you can think about to get started and then where you can go after that. Liz?

Yes. So beyond the beep.

These are really use cases that can enable that aha moment when you’re starting to use the data that’s in that 2D barcode. From a foodservice perspective, I already mentioned regulatory compliance with FSMA 204, which is really covering produce and eggs and seafood. It’s actually a lot of different things. B2B and B2C. [Logistics] And then Gena mentioned the **128 barcode. That’s really a logistics barcode**, so you’ll recognize it when you see it. If we’re ever together, we can point it out.

But sometimes you want more information in a logistics barcode than GS1-128 can hold, which is usually the GTIN, the lot batch and the date. And then Gena can speak to this more and we can have a conversation about it, but from what we understand in industry, sometimes a 1D barcode gets scratched on a case and you can’t read it and that’s super frustrating at time of receipt. So the **2D barcodes do seem to be more reliable when you start getting into a logistics setting.** I think that kind of wraps it up. I know, Ed, that we have time for some questions, and we would love to take those.

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Gena Morgan

Yes, I'll just put this up. There's a lot of data information that we just presented to all of you, and so we can touch on some of the how do I get started and possibly any of the questions about how to get ready as part of the Q&A. Is that good?

Sunrise 2027 Discussion

Ed Collupy

That sounds great. Thank you, Gena and Liz, much appreciated for everything that you shared with us. Clearly there's a lot to plan for on many fronts, there are a lot of stakeholders involved as we talked about. And the retailers on our call are going to be dependent on many folks to bring things together so they can execute on Sunrise 2027. So I'd like to invite, and we're really fortunate to have with us this afternoon, and as Ally Supporters to CTVG, Paul Kern from Invenco by GVR and Bill Miller from GK Software. And I want to ask them to just kick off our group discussion. I see some questions in the chat and we'll get to those, but I'd like Paul and Bill, if you could just take a few minutes to give us a sense of how your companies are approaching the Sunrise 2027 initiative and whatever plans you might be able to share at this point in terms of readiness or what you think our retail members should be thinking about. So Paul, could you start us off on that?



Paul Kern

Sure. So one thing I'll say that I really appreciate about all this is that there's a lot of information going on around it. So Conexus has been involved, a lot of folks have been involved. So unlike certain things that happen in our industry where you seem to find out the day before it takes effect, at least we're all being well-prepared. So I definitely appreciate that from GS1, just getting the knowledge out there. So we are aware of it, again, through the ways I've mentioned. I think I'm looking forward to being able to offer some of the advanced use cases as we develop to support it, at least things like maybe checking for expiration dates and that. So I think there's some benefit there. If we're going to do this and go through the effort, we'd like to be able to offer some additional things.

We haven't done a lot of work yet related to this other than just knowing it's out there and starting to think about kinda walk back, when do we really have to start getting this into code, given the adoption cycles and that. And so I think for us, we are looking at that pretty seriously. Generally have some, I don't know if they're concerns, but just some things that I think that we as a vendor and probably the folks as merchants and retailers are going to have to look at too. **Self-checkout is an area where I'm wondering how well this is going to work** or how it's going to look with a smaller code that folks aren't used to, probably initially both will be there. "Am I going to have any issues with two codes on one product? Am I

Self-Checkout

going to have to worry about double scans?” I have scanners, I think generally from what I’ve read, most modern scanners are going to be capable of reading them, but am I going to have to reprogram or are retailers going to have to reprogram all those scanners?”

A lot of these scanners don’t have a great way to send a **new program to them through the POS** or something. So am I going to have to have somebody out there with barcode sheets or something else to set these things up to really support, port the different codes or some of the things I’m wondering. And again, even consumers would probably be the hardest to train, but cashiers too, right? So are we going to need to train them to look for a different code. If we do enable the ability to check expiration date and a lot of the products have two codes, are we going to want to try to get people to go find that, the new 2D, first so that I get that read and we can take advantage of the extra capabilities. Those are just some of the things that I keep thinking about as we look at how do we get prepared for this.

Gena Morgan

Well, a slew of wonderful points and questions, if I may address some of them.

A couple things. So yes, training the customers. I think I left out probably the most important point, **moving to 2D barcodes and the capability of scanning them requires optical scanners**. Now the research that we have done, image-based scanners, the research that we have done is that, I think it’s even this year, about 85% of retailers will have optical scanners at their point of sale, and optical scanners are pretty powerful in what they can pick up. We have worked over the last five years with the major scanner manufacturers being the majority of the market share to understand what needs to be done within this scanner to ensure there is not a double beep. So to your point, Paul, there are firmware upgrades to existing optical scanning equipment that would have to take place if they’re not the newer models that would come out that are Sunrise 2027-capable.

It’s a firmware upgrade. And I’m not saying that’s small, but that is what it would take. And that has got a number of different modes in order to prevent double scan and how you prefer this scanner to manage multiple barcodes on the pack. What is it looking for, it ignores certain types, it sees the GS1 in the 2D and it prioritizes that over another one. Those are all things that are part of that work that we’ve done. And there’s a barcode syntax library out there for all of these different types of things. I will say that I want to make clear, come 2027, the power of 2D barcodes as we have said is that it can encode additional data that can open up all of these use cases. For 2027, all we’re really looking to do is extract the UPC and go beep. That’s the only requirement of the retailer. And then to your point, which is absolutely correct, as



Ed Collupy

Bill Miller

you get additional data in there, it's **more than just a scanner upgrade in order to ingest the lot batch code and do something with that.**

And that is where the **POS host systems will come into play** and what that looks like and what they can do with that. We are also working with some of the major manufacturers there on what that will look like. And there are retailers in the grocery space that are under pilots now to see what they can do, A, to meet the minimum requirements, just go beep and don't beep twice, and ensure that it can go at speed, by the way, checkout doesn't get slowed down. And we have done a lot of self-checkout testing with a major grocery store on that to see that that works. And so there is testing still to do, but we are intending to be in front of this to do the informing and to do more testing in the field with our retailer and brand partners. So I think I hit on most of your concerns. I'm not saying that this is an ongoing thing, but we have worked to try to get the scanner's manufacturers to the point where hopefully it shouldn't change much of what it looks like today.

Thanks, Gena. Bill Miller, go ahead.

Thank you. It's all very good information. The company I'm with, GK, we're quite fortunate so we can support all these barcode symbologies today and we're utilizing some of them, particularly the QR code aspects around customer experience. And it's on self-checkout, point of sale, mobile devices and consumers, et cetera. And tremendous opportunities and inventory control in a whole lot of ways here. When I started my career in the industry about 40 years ago, I was working in the dairy department at a grocery chain and the CEO was doing store tours, and for some reason he walked up to me and it was my first day on the job and he said, "Hey, do you have any expired yogurt on the shelf?" And I confidently said, "No." And in about 30 seconds he found three yogurts that were out of date. So, being able to know how much yogurt I have on the shelf that's past the sell date and point a clerk to that part of the shelf and say, "Hey, go take these off the shelf. You got three yogurts that are out of date," things of that nature that are so basic. This is really going to help.

The software obviously is going to have to be able to utilize the data that's being scanned so we can scan the data today in these various barcodes, we're using some of it, but doing things like, "Hey, I'm not going to allow an item to be sold that's passed the sell by date," or "I'm not going to let it be received if it's in a lot number because maybe there's a problem with that lot number." So those are all things that I think there's a **lot of work to be done on the software side. And for a lot of retailers, my guess is they don't even have the right hardware** in place to be able to scan those barcodes. So there's going to be an investment and it's going to be kind of a slow adoption, I think, over time, but the benefits are really tremendous.

Technology
Standards

Ed Collupy

Thanks, Bill. The folks in chat, I'm going to ask you to ask your questions to the group. Sanjit, you were first.

Sanjit Bajimaya

Yes, I think some of it you've answered already, but I just wanted to understand all the information around which POS providers, so which barcodes partners are already working to adapt to the changes. But 2027, as a Conexxus member, I think we should start thinking about it's going to **change the data dictionary standard** that Conexxus has published today through all this new data. Now there has to be standards that back office partners or peer providers can use in the future.

Gena Morgan

So we are part of, and someone from my team is leading, the 2D group at Conexxus to try to see what is necessary to standardize in that area. But I would say we are, with respect to point-of-sale vendors, we are working with the largest in the market share areas, your NCR's, Toshiba's and those folks, they're all quite aware of Sunrise coming up.

Ed Collupy

And I would just say that in advance of the discussion this afternoon, I reached out to one of the back-office providers that many of you on the call use, not everybody uses them, but they say that they are ready. But they are also anticipating that the Bill Miller's and the Paul Kern's of the world are going to come around and ask for things to be updated in the back-office system in order for the point of sale to provide the full capability. So I think, to Bill's point, over the next several years, you're going to see this kind of movement towards people working together and defining more what's needed. Jason, you've got a question?



Jason Collins

More of a comment. I would definitely **lean on our vendors** for this, the point-of-sale vendor especially, and then our back-office provider in the price book. **And then on each manufacturer**, all your large national brands, when are they going to start putting these on their packages? What information are they going to include in this? Since that other one's doing the labels. Internally, **we do our own labeling for deli**. So we would look at this sooner than later, so we can include information in it such as expiration, when was the product made, and stuff like that.

Strategy

Foodservice

Gena Morgan

That's the pattern we're seeing. So there are actually some products out there in the wild today that have a QR code with a GS1 digital link in them. And so brands really see the value in moving towards that, in that direction. What data they put into it is really up to the brand. And there's a number of different factors, it's in the deck, but there are a number of different factors to consider. Fast-moving consumer goods like cans of soda that don't need to be serialized and, oh, by the way, would be really hard to do with some of the existing investments and the line speeds that you're going and the equipment that you have today.

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So where they will start is just put the GTIN in there, maybe the product variant like Liz mentioned, and start there. But now they can save some space, engage with their consumer, and still go beep at the checkout. At the deli, and then the perimeter, you control that so you could start to get all of those other benefits. And that's really how we're starting to see it roll out. But you're also, just another point, you're absolutely right that you will lean on your vendors to help implement that.

Ed Collupy

Great. Yes. Jeffry, you had a question.

Jeffry Harrison

I was just curious of who was using it right now? Any retailers?

Barcodes

Gena Morgan

So your question, **the GTIN is the product identifier on anything**. So any goods that are sold at retail will have that GTIN, the UPC code. There are some grocery retailers, and I can share this as well, but there are a number that are in the US that are testing the capability to scan now. And there are European retailers as well, but we are in the initial phases and roll out of this. And really for them, and they're working on two things, the capability to read and also for their private brands and marking them with GTIN. We don't have anybody who at this moment that's in market with that yet, but it's progressing.

Jeffry Harrison

Ed, if I could have a follow-up question while I've got the mic. I just want to know what about the international markets that are a little later to adoption to technology like China and others that don't really have a legacy NCR, Gilbarco point-of-sale systems in place. How does this affect them when they're using things like WePay and WeChat and all that stuff? Is this relevant at all to that or not?

POS

Gena Morgan

It is, and I would say **when we say retail point of sale, that could take many forms**. It could take the traditional forms and the non-traditional forms and actually China is moving faster than anyone towards 2D barcodes. So we speak a lot about what it's going to take for our retailers to update their point of sale systems. But the same code will work for anywhere something is checked out today.

Ed Collupy

Great. Abhi, you have an interesting comment in the chat. Go ahead.

Abhi Patel

I'm just trying to understand what is the use case here? I know your next topic is AI and I'm just trying to figure out here where's the advantage, 2027 is future. What other use cases can we take advantage of using this?

Ed Collupy

And you had one there about how would it impact audio on self-checkout?

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Consumer Experience

Abhi Patel

Correct. For engagement purpose. When you scan it, can you retrieve some audio file, whether it's for consumer, whether it's maybe for the employee with the headset something to... I don't know, I'm just thinking out here what may be the better use case.

Gena Morgan

Yes. So I would say this, I have been at this for a bit and the question I get from retailers is like, "Listen, Gena. My point of sale system works today. What is in it for me?" And I would say... we've talked a little bit about that inventory management, customer service through not selling a recalled or expired product. And then most retailers are also brands themselves. And what 2D and web resolvability and linked data **can provide you is a whole number of experiences.**

It just depends on how you want to resolve that read. It could send you, like I said, to traceability information about that product. That depends on how granular the identification is and that you have a link. Just like the web is today, there's a resolvability service that takes you to these different linked data experiences. But those are limitless to be honest with you. And that's not all happening at the point of sale. I don't want to give you that impression, but those are different things that can begin to get unlocked.

Ed Collupy

And I recall when, Liz, you presented at a Conexxus conference, the small group of us that met with you went around the room and we came up with a laundry list and lots of ideas that I think you said they're probably all possibilities. It's just how then it all begins to come together to Abhi's point.

Gena Morgan

Yep.

Ed Collupy

Very good. Nick.

Nick Peters

Yes, Gena, I just had a quick question and if you touched upon it and I missed it, I apologize. In regard to the **deli application** that was brought up previously, I'm really interested in a world where it could possibly supplement **caloric labeling** and things like that. And I'm just curious, is there a parallel effort with United States FDA and things like that to work out a world where there's a contingency proposition where if you do have a QR code from a CPG or a manufacturer standpoint that it negates the need to actually print the caloric labeling on the product and goods itself? I'm just curious as to what that looks like.

Gena Morgan

I think that's a possibility. I don't want to speak for any U.S. government anything, but I will say there is some precedent for that. And in the CPG space, there was regulation around declaration. I think, Liz, you're going to have to keep me honest of bioengineering ingredients and stuff. And so an initiative called SmartLabel was implemented within that space. And



Foodservice

CTVG Views

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Barcodes

so you'll see it on cans of soda.

SmartLabel is a QR code and it resolves to a page of all of that declaration, that information that is required to be presented. It's not on the package, it's within the QR code and we're actually working with SmartLabel to say, "Hey," and to anybody who's implemented SmartLabel, "if you just add the GTIN in there, the UPC code, you can meet that requirement plus go beep at the checkout." And oh, by the way, as other requirements come up whether it might be something like we want all the stuff on front of pack, which that's a thing, what this could open up with respect to declarations is pretty much a lot of how it started and what it's all about.

Ed Collupy

Great. Any other comments or questions from folks before we move on? Thank you all. Thank you, Gena and Liz for taking us through that. It sounds like there's time given that there's a few years away, but I think even just our discussion points to many technology initiatives. It's going to be something that we're going to continue to be talking about for quite a bit. And in fact, Gena is going to continue talking about this in a couple of weeks at the NACS show. Gena, will be there and she will be with, I believe with another brand.

Gena Morgan

John Phillips from PepsiCo.

Ed Collupy

Yes, so thanks again. Thanks for the sneak preview. And the deck will be available.

Gena Morgan

Thanks, everybody.

Retail AI Usage Presentation

Ed Collupy

So let's switch gears and move on to our discussion on artificial intelligence. The Vision Group Network recently assisted our next guest, Randy Lee Allen, in recruiting participants in a research study she was undertaking on AI and retail. And we were asked to help through Lori at NACS. That's why Lori has joined as well today.

For those of you who attended our CTVG meeting this past December, or you may have read it in the Vision Report, back then I expressed some level of skepticism about AI but commented as we had our Lightning Round and since then in some other circles have really begun to see my own thinking on the topic evolving. And I'd say it's going to continue to evolve and certainly the findings Randy is going to share with us indicated to me that **AI will have its place in the industry.**

AI

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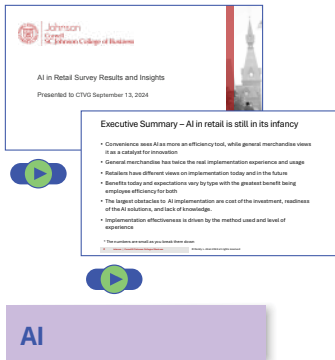
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Randy Allen

Ed Collupy

Randy Allen



Workforce

Implementation

This is the first time that the study results are being shared with the broad audience and we're thankful to Randy for her willingness to discuss the findings first with CTVG. So Randy, please lead the way.

Okay. Let me share my screen. Can everybody see it?

We see it. We're good. Thank you.

Okay. So I want to give you a little bit of back work. I won't give you a lot on this, but I want us to dive into some of the quick findings that I've got. The deck is very long and I'm writing an actual report, which as I finish it, I will get it out to all of you.

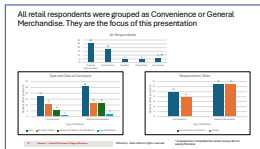
So when I looked at everything I found, I would say **AI and retail is still in its infancy**, and I don't think that's bad. I think that's very typical of a lot of technology when it comes out. There's a lot of "it's going to do everything" and we learn rapidly that it's going to take time and energy and we've got to learn. So some of the quick things I found is I think right now **Convenience industry sees AI much more as an efficiency tool**.

And I think that makes a lot of sense given that you run on very thin margins and being able to operate as efficiently and effectively is very important. I've got a slide on this next, but I probably should explain it here. We had 18 convenience store retailers, pure convenience store retailers, no food stores in here. And so when I talk about Convenience and General Merchandise, General Merchandise is anything else. So it could be a pair of footwear, jewelry, beauty, big box, discount, electronics.

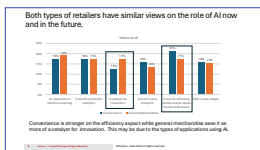
So that's how those two break out. Where **General Merchandise right now views it a little bit more as a catalyst for innovation**. They have done a lot more implementation in their retail stores than Convenience seems to have. So they've got a little bit more experience and usage. And there are a **lot of different views on what's the role that AI is really going to play** in the industry and what is it doing now and what is it going to do.

And a lot more today is this experimenting getting benefits, but is it going to be more transformative in the future? Benefits and expectations vary a lot, but the most interesting thing is for everybody, **employee efficiency is the biggest benefit that people are getting today**. So there's been a lot of talk that this is going to get rid of people. Right now it's not getting rid of people, it's just making people more efficient and more effective, which is I think very good.

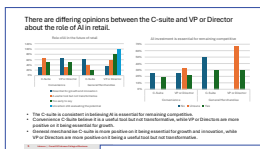
The **largest obstacles to AI implementation are the cost of the investment, the readiness of the solutions, and a lack of knowledge**. And I don't think that probably is going to surprise anybody. I did find some differences in the effectiveness



Data Analysis



Strategy



Strategy

of the implementation being driven both by the method used to implement it and the level of experience. The level of experience [is] probably pretty understandable. The more you've done, the greater the effectiveness is likely to be for your implementation. But the method surprised me in terms of the implications for that.

So this is the **breakout of the respondents**. I have about six people that didn't answer what they were. I am 99% sure they're retailers based on when they came in. And you can see we have a lot of small companies, some mid-size and three companies that go over \$50 billion in revenue. And a good mix of vice president or director people and C-suite people, which I think is interesting. And you'll see some places where we looked at the differences for those.

When I thought about how do people look at it now, the interesting thing to me was this is where I said Convenience Stores are seeing it much more as an efficiency aspect. And I've got these numbers and percentages so that they're comparable with one exception to one of the charts. But the other thing to me that was very interesting is there's **not a concise view yet out there of what is AI** really because I think we're still all learning and still experimenting and still trying to learn.

So a little bit more catalyst for innovation in General Merchandise. A little bit more on the efficiency side for Convenience Stores.

C-suites and VPs or directors kind of have some different views. **C-suite**, I think is a little bit more consistent in terms of thinking it needs to be **essential for remaining competitive, a little bit more positive as a useful tool**. I think **VPs and directors are having to implement it and are trying to really see, does it make sense?**

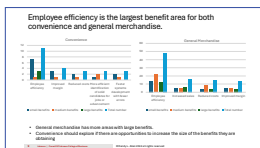
C-suite a little bit in General Merchandise on being essential for growth and innovation. And I think that's because they've probably got their boards talking to them about what are you going to do about it? What are you going to do about it? I see Nick laughing. I know this makes the charts busy, but I thought it was interesting to see the comparison.

One of the big things I asked was what are you doing today? And you can see that interestingly, **Convenience Stores are using it more in backend functions than in front-end functions**. And I think that again goes to the focus on the efficiency, the desire to drive costs out and increase profitability, whereas general merchandise is using it more in customer focused things, but generally there's very little on the real implementation side going on, a fair amount of experimental or pilot and then still a fair amount, at least 30%, that are just still thinking about it.

This block says **General Merchandise are the only people doing something with product development and merchandising**. And this really shows a lot of the **focus on Convenience Stores in the backend**, particularly that



Strategy



Workforce

ROI

administrative support and human resources, store operations and things like data visualization, reporting, developing systems, really a lot of focus, where you can see General Merchandise is a little bit more on the e-commerce, the marketing, customer service side. And you're both looking in small ways at inventory management, supply chain optimization. Finance... Convenience Stores aren't doing anything, but you probably don't need to either. I think your finance is much simpler.

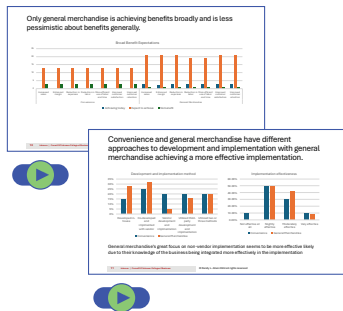
Everybody has got some plans for expansion in three years. And to me, one of the interesting things is I can **see Convenience Stores started shifting** from some of those back-office functions to thinking more about "how can I use it in marketing?" "How can I use it in customer service?" Whereas **General Merchandise is shifting too**, I'm going to take a look at some of these back-office functions that you haven't done.

I'm not sure that you're all going to get all of this done in the next three years. I think that's a fairly ambitious plan because there's a lot of people that are going to do a lot of things. But I think that's good because it says you're thinking about it and you're looking for creative ways to take advantage of it.

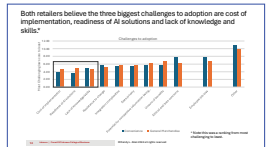
We looked at if somebody had implemented a system in any area, what benefits were they getting? And we gave them some choices that I thought were logical choices from what I know about the industry. And so were they small benefits, medium benefits or large benefits? And I didn't get them to try to quantify it because I don't think we have enough data to quantify it and really not sure if you've all really measured it in detail, but have better sense of how much benefit you've been getting.

And so you can see **both of you are really getting a lot of employee efficiency**. It's by far the biggest area. And I think one of the interesting quotes from a CEO of a general merchandise company I interviewed, he said, "I've got [it] drafting the first product descriptions from my website and for all of those things. But then I really need to go in and tailor it and make sure it's on brand message and it's really communicating what I want." And I think we're seeing a lot of the job descriptions, those types of things.

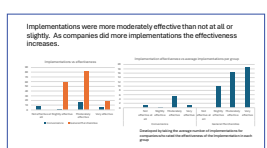
Improved margin, **both of you are getting some improvements in margin** out of it, some reduced costs. The Convenience side with a more efficient identification of solid candidates for jobs or advancement and faster systems development areas. That's that back-office function, which frankly I'm surprised that General Merchandise is not doing more of. So they're getting more increased sales and reduced costs.



Strategy



Implementation



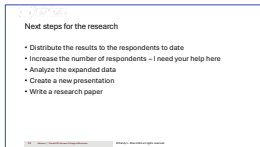
This was kind of a question that said where do you expect to get benefits broadly over the future? And there's a lot of commonality there. This one is not in percents, but you can see that there's a lot of expectation for the potential benefits to be there. The question is how are we going to get there and do we have the tools and the knowledge and the infrastructure to get there? And how long will it take?

I want to make sure I go through this enough to give you a chance to ask questions.[Strategy] In looking at how people approach development and how well they thought the implementations went, I noticed that **a lot of the Convenience Stores had relied on vendor development and implementation.** Now Ed and I talked about this and this could very much be a function of the size of the companies. There's a number of smaller companies in here and so there's more reliance on vendors. Whereas the **General Merchandise companies that responded were a little bit bigger and so they did more in-house development or co-development** or some third-party development or in some cases they used more than one of these.

And that seemed to drive a little bit more effective implementation. And one of the things I think that may be worthwhile is if there are a lot of **smaller convenience stores** that are not in competitive situations, **trying to come together to work with a vendor on a particular system** or AI implementation may be very helpful because otherwise the vendor is going to develop what they want and then it's going to have to keep getting redeveloped for new people. So that's one of the suggestions I think might be very helpful to you.

This is where we came up with [biggest challenges], you can see **cost of implementation, readiness of the solution and the lack of knowledge and skills are important.** If you took the survey, this was a one to 11 ranking, so which was the most challenging as opposed to others. So there's a lot of concern there about that cost, the readiness and the lack of knowledge and skills. And that doesn't surprise me. And I think the more sessions you can have like this, the more you can share information, the greater the benefit that you're likely to get out of it over time and be able to come up this **curve for implementation.**

And this relates again to the effectiveness. This isn't percentages. So you can see generally as people implemented more, it went up in effectiveness and then it dropped. Nobody seems to feel like they've got really strong effective implementations yet. And I think that's a combination of the product's readiness. Do you have expertise and are you ready for it? I took an average of how much everybody had implemented in each one of these bars and you can see then it really does go up as you go through.



Strategy

So my next step to things, I still would like to get more respondents. I've pulled data on all the expanded stuff. So there's like 40 questions in the survey and I got it pretty well analyzed and ready to put it together, and then create a new presentation and I'm working on a paper.

One of the other things that I think can really be helpful to the industry is where you see Convenience Stores doing a lot in the back of the business and General Merchandise doing more in the front, maybe some **shared groups** where you have General Merchandise retailers and Convenience Stores together might really get some good ideas going about things that you could learn from each other to improve in that.

One of the things I was thinking about with product was if I walked into a convenience store and I'm traveling, and I'm concerned about having good nutritious food, could there be an app that would help me figure out what would be the best things that you have to try or could that be on your website? Anyway, I think I left enough time for questions, Ed.

Retail AI Usage Discussion

Ed Collupy

I think you did, Randy. Thank you so much. So one of the findings that Randy shared and I'd be interested in hearing from some of our members was the differing opinions that the C-suite has over kind of the senior leaders in companies. And perhaps it wasn't surprising, but it does in my mind raise that question of level setting expectations and how you all might have to be thinking about that or how you're setting those expectations within your own companies around AI.

Another takeaway from me was related to that point of General Merchandise according to this study is leading the way again on the consumer's side. And given that so many other retail segments are now in the convenience "business" and really becoming competitors of ours, how do we begin to think about making sure that we're not lagging and we are not left behind particularly on that front?

So those are just a couple of questions maybe to think about. I'm wondering if anyone has got counterpoints to anything in Randy's findings. She might find that interesting. And with that as a kind of a break into discussion who would like to take us first?

Bill Miller

Technology

I'll jump in and make a comment on that, Ed. A lot of vendors in the industry were in specialized and convenience stores and there's nothing wrong with that. At our company we work across all retail vertical segments including general merchandise and fashion, and things of that nature. So we get to see a much broader perspective of the application of our technology. So I know a lot of folks on this call are probably going to be at NACS in three weeks and that's a very smart thing to do.

But one of the things I'm surprised at is that I've seen a lot of growth at the **NRF** convention in New York in January. 15 years ago, I didn't see any convenience store retailers. And every year I see more of them and I think that's a good idea because frankly it's probably **the best technology show for retail there is**. And c store retailers will get exposed to many things that you're not going to see at NACS. So that would be a good starting point. There's a lot of great workshops there. There's a lot of content on the trade show floor of other technologies.

You won't have any beer booths or anything like that, so you don't get that benefit. It's pure technology. So anyway, that's a recommendation I would make. And it gets convenience retailers exposed to how other different retail segments are doing and how they're innovating.

AI

Randy Allen

I think that would fit that bringing them together. There's also this **Retail AI Council** which also helped send the survey out and I don't think that they're restricted in who can join. So that might be another way. And they're really focused a lot just on AI. I mean, that's all they're focused on. So that's another opportunity.

Ed Collupy

Rick, go ahead.

Rick Sales

Yes, thank you. So first of all, I want to echo Bill's comment about NRF. Myra knows I talked about NRF for many years and I that I go there to see what retailers and other channels are doing and find the ideas that are relevant to the convenience store industry and bring them to the industry. So it's been a great source of information for me. And in my comments in the last meeting I talked about the fact that the last NRF were like 25 people talking about AI and my particular space where the year before there weren't [any]. And many of them could not really answer questions about what they were doing. But the reason why I raised my hand is I am a respondent to your survey and I'm a vendor, I'm an Ally Supporter. So maybe you threw out my data point and you were really only looking for retailers.

I got to the end of the questionnaire and I said, "I'm not sure that she's really looking for my answers," but I still provided them. I didn't know if looking at retailers, whether it's a retailer like Bill that does multiple channels or retailer like me, that only does convenience. But I agree with his comment also that we do see a lot of expectations and input from retailers

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on what they want to see. And we're using AI to deliver a solution and not sure that that was captured in your survey, but I'm not sure that that fits your research questions. So I just wanted to ask about that.

Randy Allen

So I'm glad you responded. In this presentation, I did not include you, Rick. I am doing an analysis of the entire thing and not splitting groups out. And you are definitely included in that. And there are some similarities because I think the vendors and the consultants that responded have a sense of what's good for retail. You know a lot about retail. So I think I got a lot of good insights there too.

Nick Peters

Yes, so first, Randy, thank you for doing that. I did appreciate the survey. I thought it was a very thought-provoking exercise and I am excited to see more results come from it. I think I can **explain the C-suite and the VP to director kind of disconnect** that you kind of saw in your data. And what I can really attribute that to is really I think the C suite, they're more breadth, less depth, so they tend to have to be future thinking. And unfortunately in the c-store industry, even though there's some bigger titles that may apply to some organization members, at the end of the day we're pretty grassroots and we're still kind of in the trenches with a lot of things. So I say all that as to say some of the bigger operations, they have different business innovation teams versus traditional IT teams.

And so to that point, I think some of the more pragmatic, a little bit more, I don't want to say negative, but less optimistic is really around a world of IT teams that are in a world of break fix.

And that kind of segues into this whole concept of the reason why there's a lot of back of house is because when you're a **smaller IT team and you've got less resources, you lean on your third-party partners to solve these problems.** And news flash, the PDIs of the world and all that kind of tapers into the whole back of house type of results that I think you're getting out of that. So I do see some connect the dots there that make a lot of sense. And I do want to take it a little bit further that smaller retailers, and we're 62 locations, so I don't consider ourselves a big retailer by any nature, but I do rely on third-party vendors to help with bringing those AI innovations to the table because to your point in your first slide, it's very expensive.

We don't have a lot of dollars for R&D and exploratory surgery on that. So we're trying to figure all that out and trying to figure out where that goes and how that plays out and adoption levels, that kind of all tapers into this whole concept. So I do think that some of this data is not shocking to me. I am interested in employee efficiency benefits as well, back of house functionality from a data analysis standpoint. I do think there is some financial benefit that can come from it.

Data Analysis

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And I just want to close with saying some of the results that you're seeing, I do wonder if some of those results **were direct benefits of AI or are some of those results also byproducts of other AI implemented functions and features**, i.e., I implement good AI against my analysis and therefore that creates an environment where my margins get better. So I just kind of wanted to put all those thoughts out there and thank you again.

Workforce

Randy Allen

And Nick, let me say too, one of the things that I really thought about and I didn't say is if you're getting **employee efficiency** and you're not getting rid of people, you're getting your **talent focused on other issues** that will help drive margin increases or better customer service or think about other things that you can do to improve the business. And I think that's a really important thing in retail because so much of retail is detail and if you don't have any time to think, you can't do some of those things. So to me, getting employee efficiency is actually a really good thing here.

Ed Collupy

Jeff, I see you shaking your head and because you're representing kind of a segment of the business that's very involved with people wondering what your thoughts are on what Nick had to say and what Randy just chimed in with there?

Jeff Carpenter

Well, what Randy just shared was striking to me because you can always throw more labor at the operation, but what the customer walks away with is ultimately the experience. So that's really the crux of what we're after. So thinking about how that improves the many facets of that is a big topic area.

Consumer Experience

Randy Allen

[Consumer Experience] And I think there really is **a lot that you can do for the customer experience** in the stores with AI where the customer could use some help trying to figure things out. And if you can support that with some AI and technology and not have your people need to know things, it still may increase your sales and improve the overall customer experience.

Ed Collupy

I'm going to go back to the finding about the C-suite versus director levels. Erin, I'll put you on the spot for this one since you're at the top of the heap there at Robinson. Do you have a different expectation of what AI will potentially do for the business, even if it's down the road than maybe your team?

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Erin Graziosi

Implementation

I don't know if it's all that much different. I mean, we're so behind in any of that. I think that we know that it's possibly a huge opportunity, but **how you implement it is questionable** I think for someone of our size. I forget who made the comment, maybe it was Nick, but it's the bandwidth and ability of people here to take advantage of it. So we're looking at different ways to do it. I think we have a huge curiosity about it, but it's the implementation piece or where you even start. I think that's some of our challenge.

Ed Collupy

And Donnie over time and at our CTVG meetings, you've talked about establishing partnerships and all. Have you done anything on the AI front with solution-provider partners?



Donnie Rhoads

Strategy

Have we done anything with our partners on AI? Not directly. Are most of our partners trying to work with AI? I think absolutely. **We're not going to be developing any of our own tools anytime soon.** Eight store chain and all, but depending on the third-party partner that you choose to go with, I think that those are really high-leverage decisions that small and medium-sized retailers are going to have to make. We have some really quality industry partners that we're going to be working with, and I know that they have a lot of irons on the fire right now. We have not moved on any of them yet. We've actually **started to do a little more on the retail media network stuff before we've done any AI stuff.** It's a little more tangible in our sense, but we're excited to see what some of the industry leaders are going to come out with and reports like the one that Randy put together are exceptional resources I think for the future.

Ed Collupy

Very good. Rance, anything going on at Toot'n Totum since we talked about AI a while back. I think maybe even at our very first meeting you put up a slide of the future convenience store of what some AI tool was going to look like.



Rance Wells

Well, I had a subscription to ChatGPT. I don't have my subscription anymore, so that might tell you how much I'm using it.

Again, **it's all about ROI for us.** I mean, are we going to have return on investment on either putting all of our data into one of these tools and having it give us an analysis? We keep looking over the fence and looking to see what's over there, but I mean we have not been on anything yet, so we still keep looking. Others keep telling us that they're doing things, but again, it's all about ROI for us. We haven't found it yet.

Ed Collupy

Very good. Thank you. Lori what are we going to see at the NACS Show this year relative to AI?

Lori Stillman

So we have a couple of things that are built into **the agenda.** I mean I think you're going to see it in drips and drabs in a lot of different places on the show floor, but I know we have one session that I'm particularly excited about that it's kind of a point-counterpoint. So we have industry consultant and I believe it's A.T. Kearney and Microsoft talking about bells and

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whistles versus implementation realities. And so we thought that would be kind of a fun session where I think in many cases people get sold on all of the big ideas that are there, but the reality of implementation sometimes can put a bit of a governor on that. So I think that's one particular session that I'm very excited about.

And then we have a session on marketing and AI. Our digital marketing session, which is talking about THRIVR (<https://www.convenience.org/THRIVR>), is going to speak to some of the AI capabilities that are now embedded into that solution, that will recommend how to respond to customer reviews, et cetera. So you'll see a couple of things across the show floor in different places.

Ed Collupy

Great. Donnie? Jeffry, I'll come to you next.

Donnie Rhoads

Really quick, first of all, number one I can vouch for THRIVR, we have used some of those AI tools. So those are neat.

Lori Stillman

Thank you.

Donnie Rhoads

Very direct use case there. So simple for somebody like me to wrap my head around. The other thing I was going to say...I was reminded by the Microsoft comment. I know that we all see them as kind of an industry leader on AI and some of the people obviously pushing it at the very front. And I have heard that they have a mandate internally to just use Copilot as much as possible so that they can understand how they can get a benefit from it. So everybody at every level of the scene right now is trying to figure out how it's going to best work. It's not just end users, it's the ones who are developing it as well.

Technology

Jeffry Harrison

I think just add on that, Ed. It's a good point. I think what's happened, and this is just the Jeff review here, so take it for what it is, but what we've seen is **hardware has gotten better and better, but hardware has basically plateaued** in my opinion. I have an iPhone 13 Pro, I'm looking at the iPhone 16 pre-order right now. What, it's got an extra button? And I mean, **it's all software driven now** is my point. So everything is maxed out. Why this is the next frontier as far as AI goes is because when ChatGPT launched on the market over a year ago, people could make images all of a sudden and before they would just try to steal images from Google and copyright issues and stuff. So now all of a sudden, it's giving that creativity, which I think is so unique and I think we crave as humans, it's having that creativity ability and the ability to express what we're thinking in our heads.

So I think that's real unique and I think c-stores can tap into that with their marketing and their cheekiness, whether it's Weigel's and the way they poke fun on Twitter and do some unique things. So I think there's a lot coming and I think it's

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Randy Allen

going to be very fascinating. I think that's the idea that's going to be really powerful is the creativity with that. So I'm excited to see what that unlocks from a marketing perspective with a lot of these retailers.

Jeffry Harrison

One of the things that, Jeff, I found is some of the retailers that we interviewed some people are very concerned about copyright particularly.

Randy Allen

And when you think about most of the training that's been done on AI right now, it's stuff in the public domain or it's stuff that they're getting lawsuits on for copyright. And I think the **real benefit to AI is going to be when it's learning on your information** and your data because then, surrounded with some other general knowledge, that will make it much more effective.

Jeffry Harrison

Just to continue the back and forth. I think I hear AI and we all hear it and we all want to do it, blah, blah, blah. But me, our company, app company, what we're just trying to do is get these retailers to have good pictures of their storefronts and to have pictures of associates smiling and maybe some video content of your great chicken that you like to brag about. Show me some B-roll of you breeding the chicken that is not coming out of a bag that came from US Foods or Coremark or something. Show me that. I want to show that to the customer. I need to explain your story. Why do you donate to the local T-ball team in town? What are you doing? So it's like I get the AI jump, but we're **missing this middle gap in c-store** and it's really bothering me. So I'm kind of on this crusade right now to help people just shore up the basics and be careful going from zero to 60.

Strategy

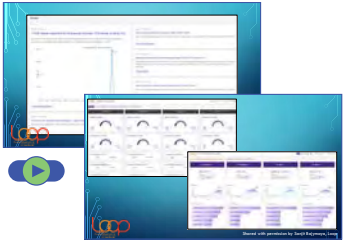
Ed Collupy

Sanjit, you guys have always kind of been on the forefront of new technologies and things. Have you been doing anything on the AI front?

Sanjit Bajimaya

Yes, so we started talking about it last year in 2023. So the easiest implementation for us was, we thought at that time, was to bring all the different disparate data systems together, **be like a data lake and put an AI layer on it**. So we did that last year and this year every day we publish that like a strip of newsletter or newspaper. It was like three year reading to me, [but] what that layer does is stores all the data underlying [it] and sends you stories. We can know about a sales margin, why your sales were up last week, why it was down.

Strategy



Ed Collupy



Myra Kressner

Bill Ridge

Technology

So this is an example. So this is what we did. So every day it kind of goes into the data and sends out different news articles based on who needs it. It doesn't send to everyone, if it's fuel management related it sends to a fuel manager, if it's loyalty management it sends to loyalty manager, if it's district managers, they might go district managers as why sales were dipping in a district. So kind of started on this one. I know it seems not fancy, but as Randy mentioned, it is expensive and takes a lot of learning and understanding of it.

Very good. Thank you. And thank you for sharing that. Lori did put something in the chat to update us on the session at NACS, it's Brian Gray from Accenture and Jerome Rose from Microsoft. So those are the two solution provider consultant types that will be point-counterpoint as Lori said at NACS. And the session is going to be moderated by Casey's CIO, Sanjeev Sattaru. So thanks Lori for updating us on that.

Bill?

Just really quick. From a smaller retail person, I'm going to mimic what Nick said as we rely on our vendors a lot to provide that kind of technology. That being said, we also have to make sure our vendors are paying attention. And I'll say that in that what seems to happen in the last six months since we first started talking this is people came on the scene very quickly like ChatGPT and it kind of became the darling and it's slowed down in that the consumer isn't using it as much. They played with it and now they aren't. I think the big gains are going to be made when Apple does get this together and Google gets this together and they're **providing that framework** that allows them on top of everything to use everybody else's data, whether that's through apps or whatever.

I think it's just taking a little longer than we had thought it was going to be, but I think that's the ultimate thing there in terms of the consumer when they can just talk with their phone or talk to their car and that interface is talking to all the other data. Until it gets that way, people aren't going to really use it that much until it gets at that top level. So that's just my impression and I think it's kind of slowed. I don't think it's going to happen as quickly as people think it is because **that whole framework has to be built out** and then it has to come down to the people that have all the data. I just wanted to add that.

Ed Collupy

Oh, perfect. Thank you, Bill. Rance?

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Computer Vision

Rance Wells

Another AI piece we've been looking at, if you remember Conexus two years ago, it was literally computer vision, AI and Conexus, there's a lot of that. We were looking for replacement NVRs (video recorder for IP cameras) to move to **a new solution that could let us be a little more proactive**. Example, wet floor sign is not out when someone's mopping. We want AI to alert on that. And that's kind of like our first level when we're looking at any NVR replacement is can it tell us that to where we don't have to train it, we don't have to buy special cameras and all the other stuff. And I mean, we talked to ABC.AI about six different ones and it's all in the roadmap. It's all going to happen and none of it was today. So I mean, I think that computer vision side, we're not going to develop it. We're just wanting to buy something off the shelf, throw it in there and license it and go on. And it's either too expensive, a thousand dollars plus a month per camera, which no one's going to do that, or the technology's not ready yet on scale.

Ed Collupy

Interesting. I think that echoes some of what Randy found in the study. Jason.

Jason Collins

Strategy

Yes, I just want to echo the theme that we're going to **wait for our vendors** to really bring this to us. I think that's when you're going to see the leap into the retail space is when the large vendors in this space are offering this and have packages that this is useful. Right now I think AI is kind of cool. When does AI become the useful must-have product in your store? And I'm not sure it's there yet. Right now it's kind of the cool product and it's neat to say, hey, I'm using this in my store, but when does it really become useful, especially for the store manager and the people boots on the ground at our sites.

Randy Allen

Some people are finding, Jason, that it's very helpful in training store people. So it cuts down the training time. Also, can use it to ask questions and get answers, which isn't sexy, but it can be helpful.

Jason Collins

Yes, that's always the battle of the training. I can see the use there, but when you rely on only that to be training, that can become a problem too, versus having another cashier or assisting store manager assist in that training as well.

Ed Collupy

Any final comments from anybody or thoughts? Well, very good, Randy. Thank you.

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Closing Thoughts

Jeffry Harrison

I was just curious. This is going to be our last meeting before NACS, so I'm just curious if anyone's going or how many people are going? Majority? [a number of hands went up from members and Ally Supporters, alike.] Cool. Awesome.

Ed Collupy

So this afternoon has been just full of learning, chock-full as Myra said, for some of us that we're on just before the top of the hour. But Randy, thank you very much for your presentation for the insights you shared with us. Really appreciate it.

If there's another survey that you're doing, look to us to help you connect with some retailers for sure. And also thanks again to Gina and Liz for their insights on Sunrise 2027 and the biggest thank goes to all of you, our CTVG members. We really appreciate the contributions that you've made to today's discussion. And just a reminder, please feel free to reach out to Myra or me at any point with any ideas on topics for future meetings. And speaking of future meetings, our next quarterly meeting will be on Friday, December 6th.

And then we have selected the dates for 2025 and we'll be sending those out to you shortly. So as Jeffry said, and I saw the hands go up, I'm really looking forward to seeing a number of you at the NACS Show in a few weeks. And just a plug for Robert Hampton and me, I'm going to be joined by another retailer from Cubby's for a discussion actually on AI use cases. So we're looking forward to that education session on Monday afternoon and hope you can join us for that. Jeffry, as he said, is also taking this stage at NACS and you have a much cooler title by the way to our session. Just kudos to you and the marketing folks that came up with that. So with that, thank you. But Myra, I'm going to let you wrap us up. I know you have an exciting announcement to make.

Myra Kressner

Yes. So in our one minute left, of course, I join Ed together with Eva and Roy in thanking everyone and making the CTVG as dynamic and important as it is. So the big announcement is that we are starting a Conexxus Vision Group. So you will see next week the press release announcement about this. But to quote Gray Taylor, "Conexus is very excited to be working with the Vision Group Network on this new initiative. Our goal is to maximize interaction." And essentially, I will interject that the discussion again about C-suite, getting C-suite involved in all of these discussions is one of the primary goals of the Conexxus Vision Group.

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So we'll be very engaged with the members to lead the discussion on innovations that we will then be sharing as our other vision groups do. After each meeting, we will have a Vision Report, the Conexxus Vision Report, which will then be shared with the entire industry. I know Robert, you do know about this and so we are very pleased and Raymond you too. So Vision Group Network is very pleased to now be starting the Conexxus Vision Group and the first virtual meeting will be in November. So you'll be hearing more about that real soon.

Ed Collupy

Super. Thanks Myra, congratulations on another group. I think that's exciting seeing the Vision Group Network grow.

Myra Kressner

Well, we do have three more groups that are coming as well, but I know we're at the top of the hour, so I didn't want to go into those in more detail.

Ed Collupy

We'll give you more time next time. But thanks. Thank you all for joining. Have a good weekend ahead for everybody and see many of you in a couple weeks.

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The Next Dimension of Barcodes

How 2D Barcodes are Changing the Supply Chain

Gena Morgan, Vice President - GS1 US

Liz Sertl, Senior Director - GS1 US

September 13, 2024



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Business Requires Change

Brand owners, regulators, retailers, and consumers all need more of the right data in the right place.

Better data in a 2D barcode provides stakeholders with what they want.



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Sunrise 2027: Moving Forward Together

Meeting the needs of business requires getting specific information to the right place at the right time.

This is where 2D barcodes are essential for moving forward.



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The Global Migration to 2D

The need to improve information sharing is not unique to the U.S.



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Use Cases Made Possible by 2D



Inventory Management



Sustainability



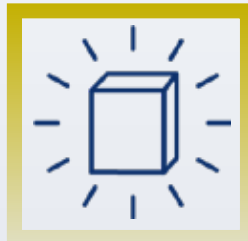
Traceability



**Consumer Engagement—
Access to Trusted Resources**



Safety



Improved Packaging



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Key Information on Sunrise 2027 and GS1 Digital Link



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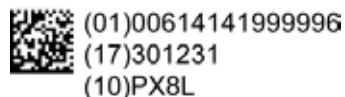
2D Barcodes Deliver Better Access to More Data

Plain



CAN CONTAIN:
Primary identifier (GTIN)

GS1 Element String



CAN CONTAIN:
Primary identifier (GTIN)
+ attribute data

GS1 Digital Link URI



(01)00614141999996

CAN CONTAIN:
Primary identifier (GTIN)
+ attribute data
in web-compatible format



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GS1 Syntaxes for Barcodes

Global Trade Item Number (GTIN): 00614141999996

Expiration Date: 31 December 2030 = 301231

Batch/Lot Number: PX8L

These barcodes are being used for example purposes. Syntaxes may be used in other barcode types.



Plain

614141999996



(01)00614141999996
(17)301231
(10)PX8L

GS1 Element String

(01)00614141999996
(17)301231
(10)PX8L



(01)00614141999996

GS1 Digital Link URI

https://example.com
/01/00614141999996
/10/PX8L
?17=301231



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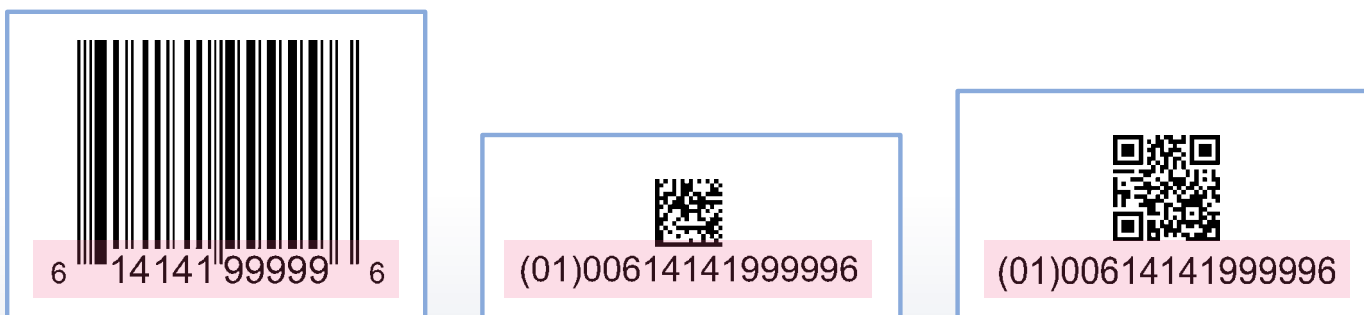
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Same GTIN in 1D and 2D Barcodes

Once a GTIN is created for the product, it can be used in the barcode that best suits business needs—even if those needs change over time.

The same GTIN number used to identify the product in a UPC barcode is used in 2D barcodes.



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The 2D Barcode Options for Retail Products

GS1 DataMatrix with
GS1 Element String



Best for those that need **more data** but are not enabling a consumer experience.

QR Code with
GS1 Digital Link



Best for those that are enabling a **consumer experience**.

Data Matrix with
GS1 Digital Link



Best for those that are enabling a consumer experience **but cannot fit a QR Code on-pack**.



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Key Points on Barcode Options



For Brands

If moving to 2D, you can pick which 2D barcode makes sense for you.



For Retailers

All three 2D barcode options must be turned on across retail systems.



For Both

1D barcode options are not going away. They can still be used by brands and will remain options in retail systems.



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1D Barcodes Remain Until Systems Ready for 2D

Until systems are updated to scan and process 2D barcodes and the data they contain, 1D barcodes must remain on products.

This means that those looking to leverage 2D barcodes before industry fully enables the capabilities will need to include **BOTH a 1D and 2D barcode.**



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So More Data...



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Types of Barcode Data Beyond GTIN

- **More granular identification**
 - Consumer product variant
 - Batch/lot number
 - Serial number
- **Sourcing information**
 - Country of origin
 - Production location Global Location Number (GLN)
- **Variable measure attributes**
 - Weight
 - Price
 - Count
- **Dates**
 - Production, sell-by, expiration, etc.



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Consumers Can Engage Directly From Packaging



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Barcodes, Data, and Beyond

The barcodes hold data for systems to act on.



The standardized GS1 data in the barcode identifies the product.

<https://dalgiardino.com/01/09506000134352>

Where the barcode data takes you can change **without** changing the barcode.



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Linking to Content with GS1 Digital Link

Using GS1 Digital Link does **not** require new web content to be created.

Example type	URL example	Could all be redirected to
URL not in barcode	http://www.example.com/uniqueLink	https://www.example.com/
 QR Code not using GS1 Standards	https://www.example.com/ultimatepromotion	
 QR Code with GS1 Digital Link	https://example.com/01/09506000134352?17=301231	



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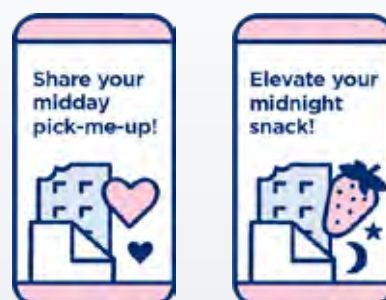
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One Barcode Linking to Different Experiences

Language Settings



Time of Day



Location



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Getting Started



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What Can You Do Now?

Stay informed and share learnings



Learn more
about Sunrise 2027



Connect
with partners



Test
your systems



Pilot
2D barcodes



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Retail Readiness



For Sunrise 2027, retail POS systems must be able to process **at least the GTIN** from 2D barcodes in addition to existing 1D barcode options:

GS1 DataMatrix



QR Code and Data Matrix with GS1 Digital Link



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Retail Readiness

Retailers enabling 2D capabilities need to test the following:

- When multiple barcodes are on-pack with GS1 data, the product is only captured once.
- When barcodes are on-pack that do not have GS1 data and are not used by the POS, they are ignored.
- If additional data is in the GS1 barcode that the POS does not use, it does not prevent the used data from being captured.
- Any existing non-GS1 barcodes used by the retailer POS still function as intended.



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Determining Where to Start

Product Starting Points



Available packaging space for 2D



New product launch



Packaging redesign



Existing equipment able to create and print 2D



Product sold to a limited market



Migration to use of GTIN from other identifier or no identifier on-pack



Product already using 2D barcodes that are not GS1 compliant



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Beyond the Retail 'Beep'



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Leveraging Data Throughout the Supply Chain

The need to get specific information to the right place at the right time does not stop at retail point-of-sale.

- Consumer products scanned in foodservice channels
- Regulatory Compliance considerations with FSMA 204
- B2B and B2C use cases for GS1 Digital Link beyond retail
- Data needed by some cannot fit into a single GS1-128
- 2D barcodes cited as more reliable than 1D by some



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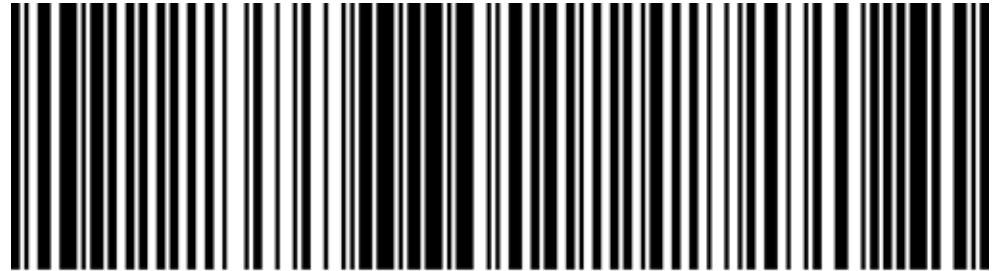
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Barcode Size Example

These barcodes all contain the same GTIN, expiration date, and batch/lot number.



(01) 0 0614141 99999 6 (17) 280115 (10) 123456



<https://example.com/01/00614141999996/10/123456?17=280115>



<https://example.com/01/00614141999996/10/123456?17=280115>



(01) 0 0614141 99999 6 (17) 280115 (10) 123456



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2D Barcodes and Machine Vision

- Machine vision applications use image-based systems to capture and act on visual information.
- Image-based system technology can also read barcodes.
- Capturing the data in barcodes supports:
 - Identifying the product through the GTIN if it cannot be recognized and to “train the system”
 - Examples: damaged product, seasonal packaging
 - Acting on expiration date, batch/lot number, etc.
 - Using serialization to account for the specific product as it moves



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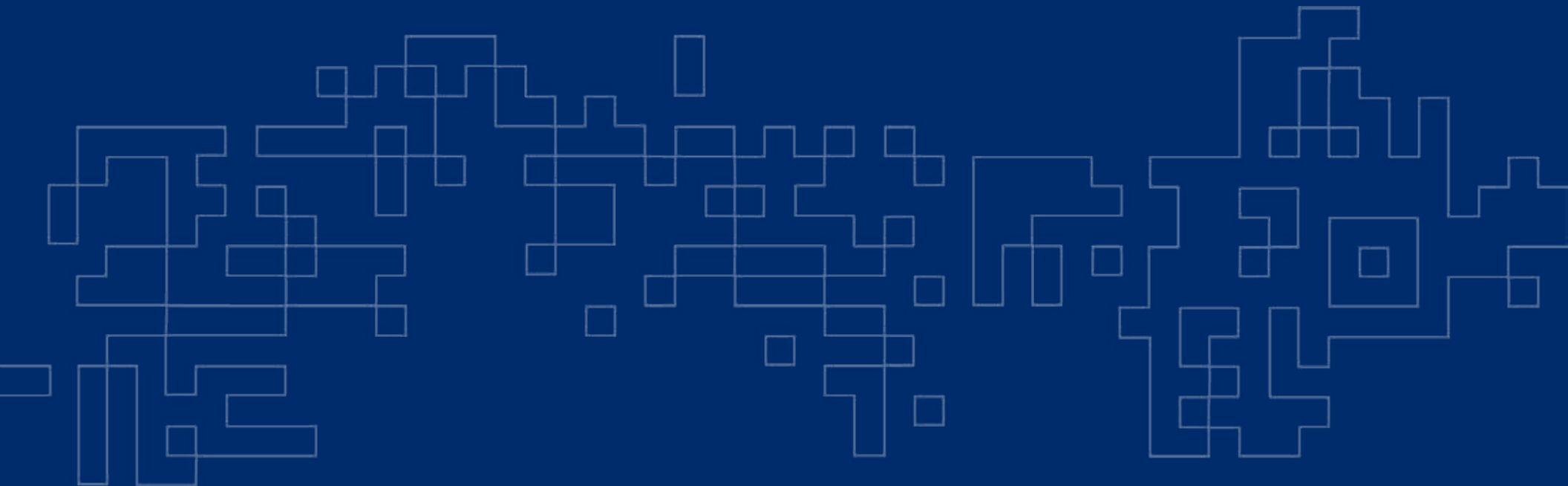
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Resources



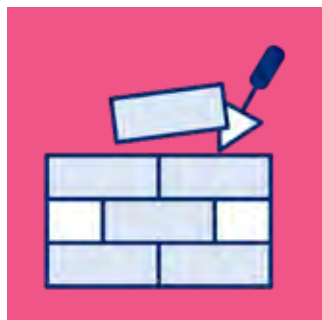
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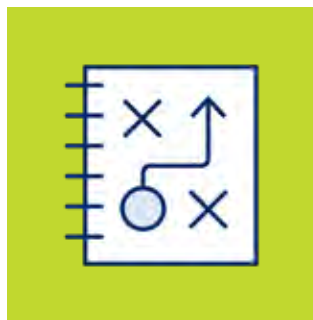
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Resources for Your 2D Barcode Journey



Standards

Provide the core standards and rules for use of 2D in retail



Guidance

Give recommendations and details on how to apply the standard to bring 2D to life



Tools

Help to simplify integrating standards and guidance into systems



Collateral

Offer a mix of media and resources to support specific stakeholder needs



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Key Resources

Standards

- [GS1 General Specifications](#)
- [GS1 Digital Link Standard: URI Syntax](#)

Tools

- [GS1 Barcode Syntax Resource](#)
- [Barcode Capabilities Test Kit](#)
- [GS1 Module Count Tool](#)

Guidance

- [GS1 2D Barcode in Retail Implementation Guideline](#)
- [Unlocking the Benefits of 2D Barcodes in Apparel and General Merchandise](#)

Collateral

- [Videos](#)
- [Case Studies](#)
- [Web Content](#)
- Topic Specific Overviews
- [FAQs](#)
- [Solution provider readiness self-attestation](#)



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Contact Details



**Think of a question or
want to talk more?**

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Senior Director, Supply Chain Visibility

Email: esertl@gs1us.org

For general information on 2D,
contact sunrise2027@gs1us.org



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Presentation Part 2: AI in Retail Survey Results and Insights

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Johnson
Cornell
SC Johnson College of Business

AI in Retail Survey Results and Insights

Presented to CTVG September 13, 2024



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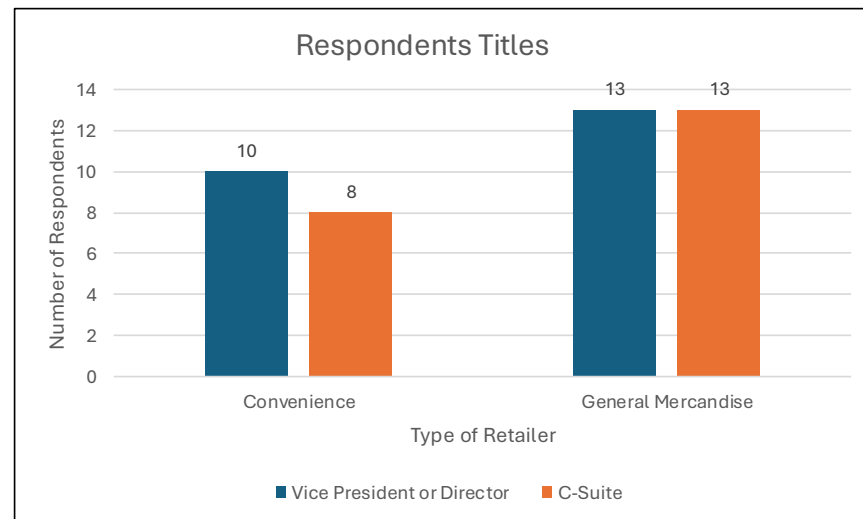
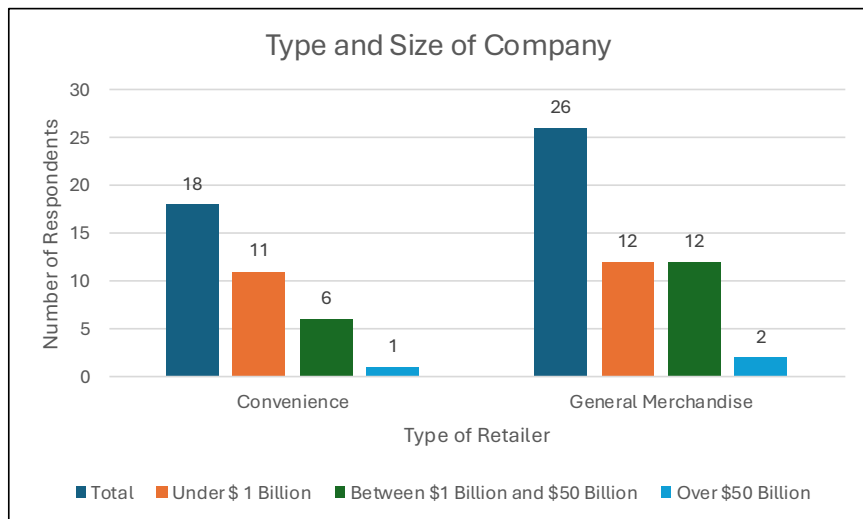
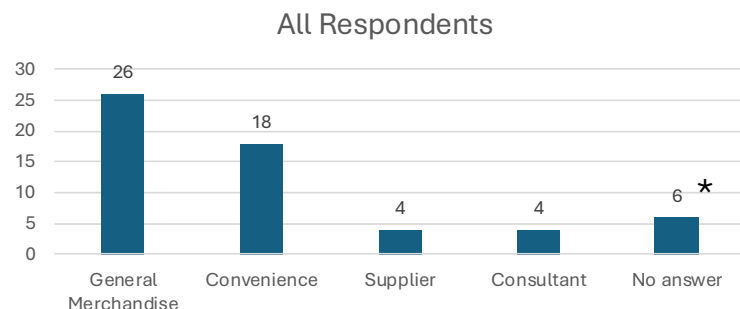
Executive Summary – AI in retail is still in its infancy

- Convenience sees AI as more an efficiency tool, while general merchandise views it as a catalyst for innovation
- General merchandise has twice the real implementation experience and usage
- Retailers have different views on implementation today and in the future
- Benefits today and expectations vary by type with the greatest benefit being employee efficiency for both
- The largest obstacles to AI implementation are cost of the investment, readiness of the AI solutions, and lack of knowledge.
- Implementation effectiveness is driven by the method used and level of experience

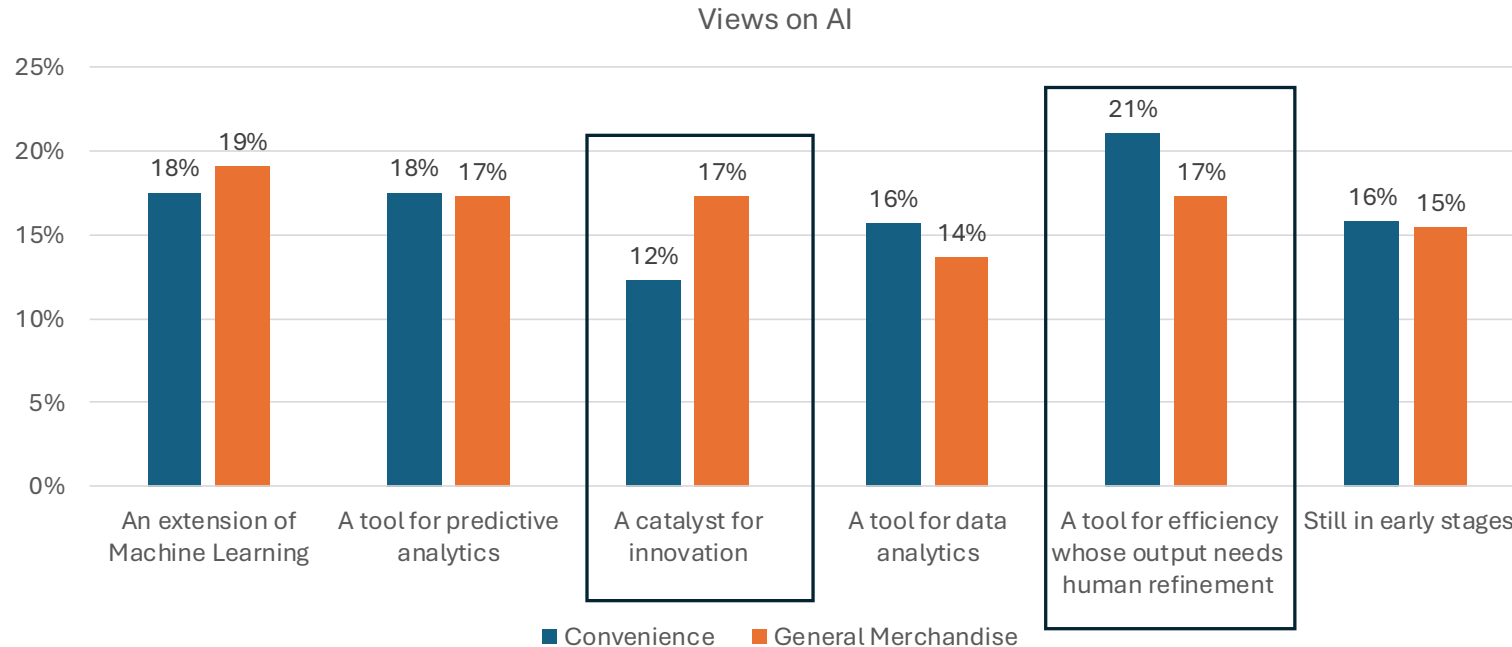
* The numbers are small as you break them down



All retail respondents were grouped as Convenience or General Merchandise. They are the focus of this presentation

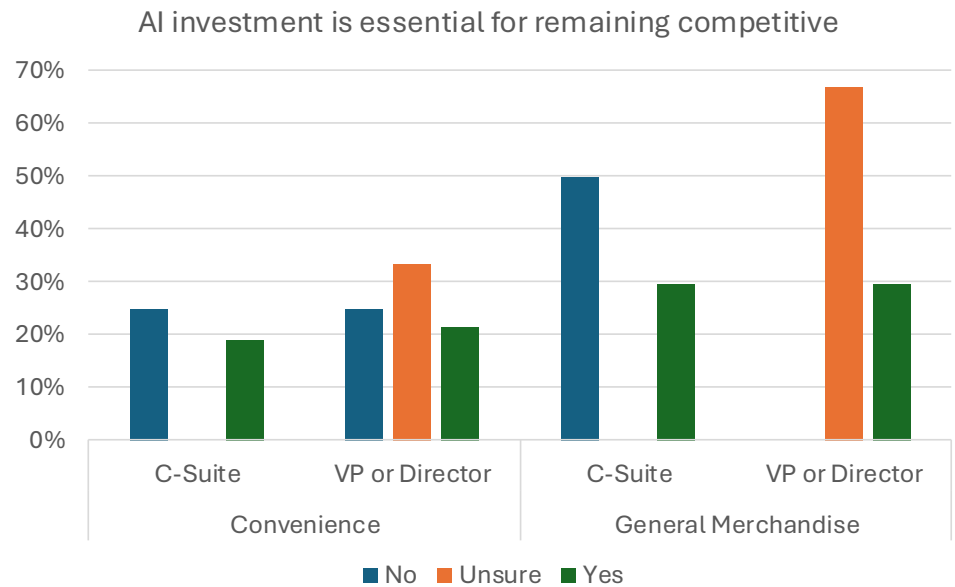
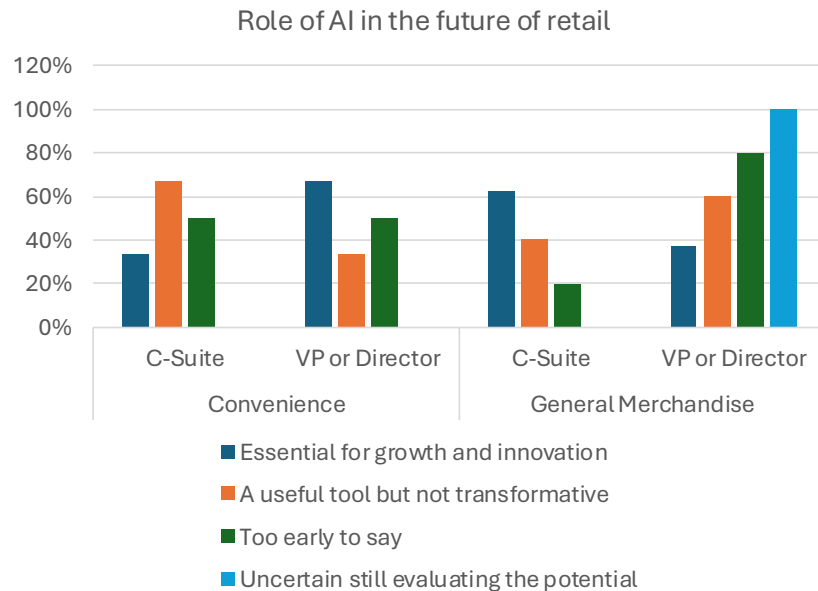


Both types of retailers have similar views on the role of AI now and in the future.



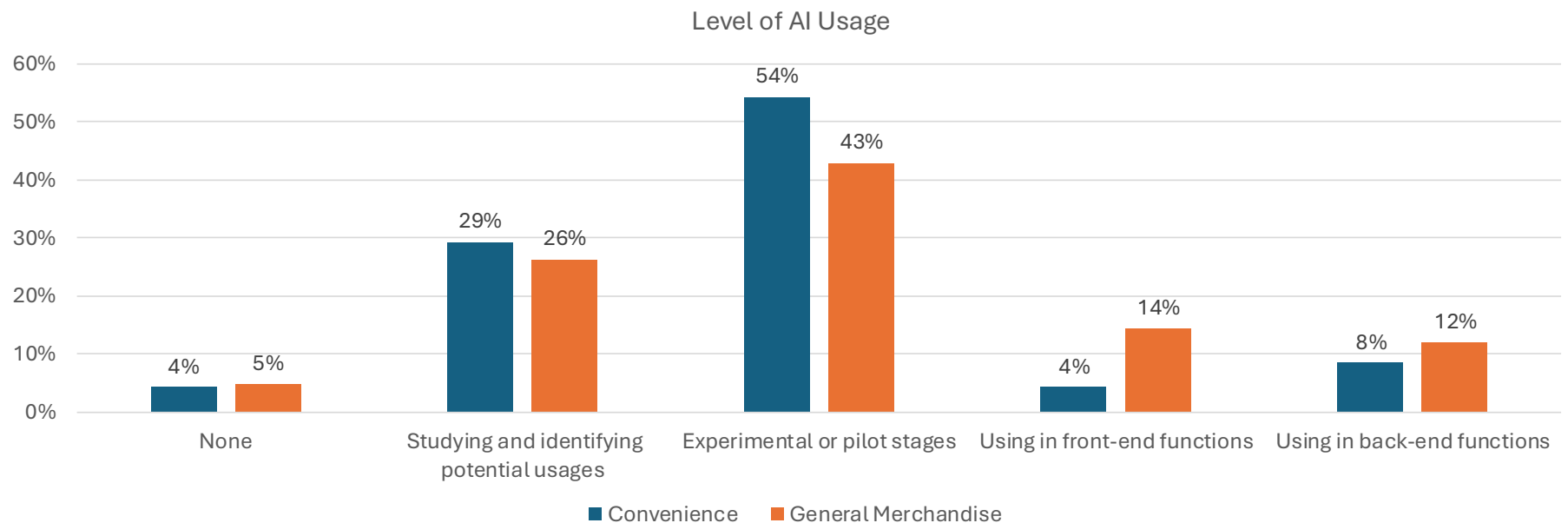
Convenience is stronger on the efficiency aspect while general merchandise sees it as more of a catalyst for innovation. This may be due to the types of applications using AI.

There are differing opinions between the C-suite and VP or Director about the role of AI in retail.



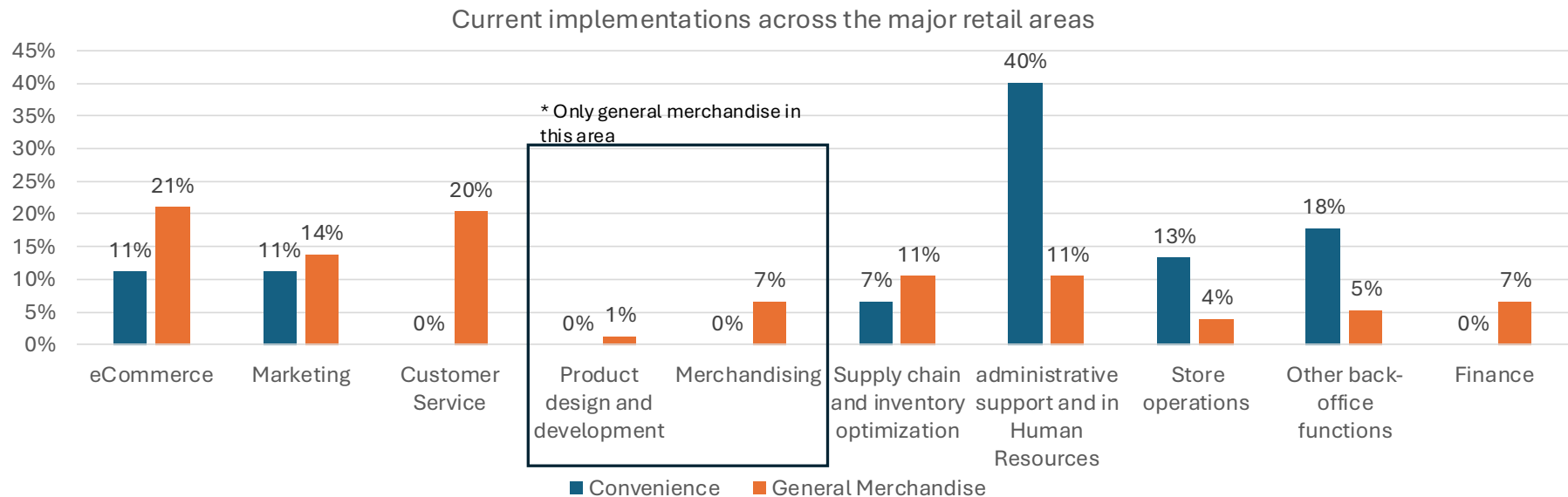
- The C-suite is consistent in believing AI is essential for remaining competitive.
- Convenience C-Suite believe it is a useful tool but not transformative, while VP or Directors are more positive on it being essential for growth.
- General merchandise C-suite is more positive on it being essential for growth and innovation, while VP or Directors are more positive on it being a useful tool but not transformative.

General merchandise has twice the real implementation and usage than convenience.



This difference is likely contributing to the great number of implementations and benefits being experienced by general merchandise.

Convenience retailers focus more on back-office functions and stores. General merchandise focuses more on eCommerce, customer service, along with merchandising and product.

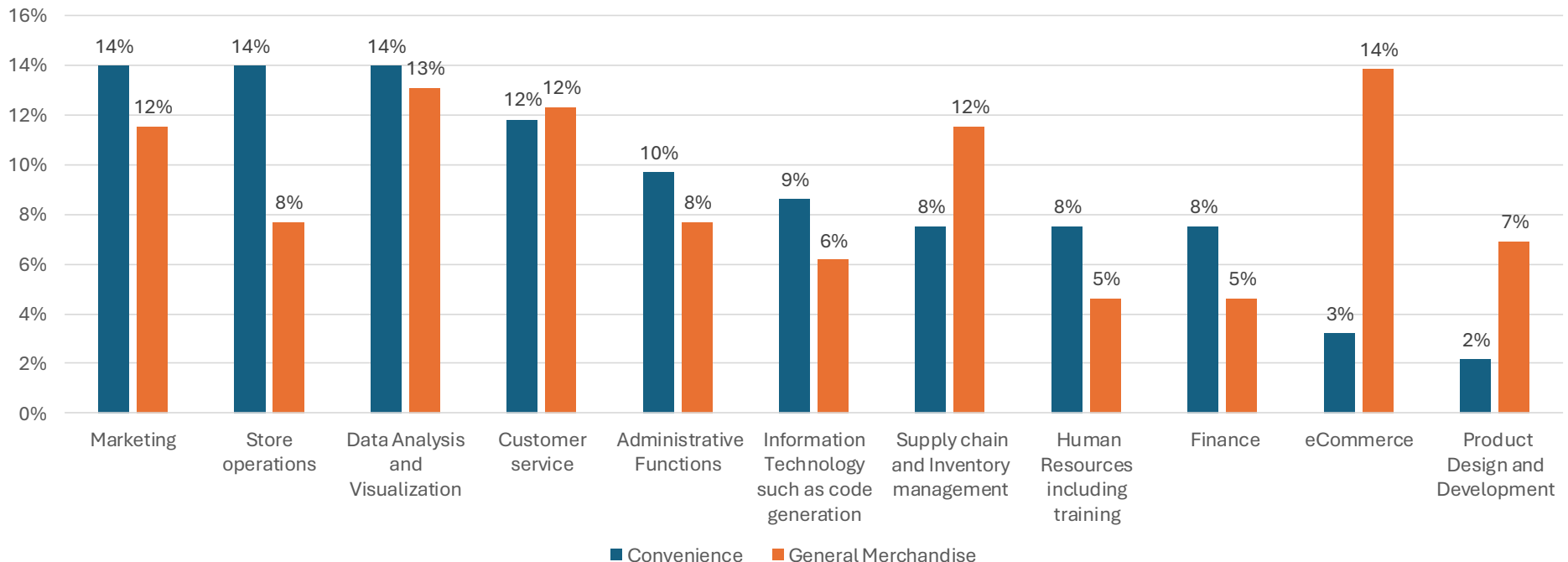


- There are opportunities to learn from one another in areas where implementation levels vary. Creating a group or expanding an existing one would provide an opportunity to learn from each other.
- This exchange of experiences could lead to broader uses of AI and greater benefits.



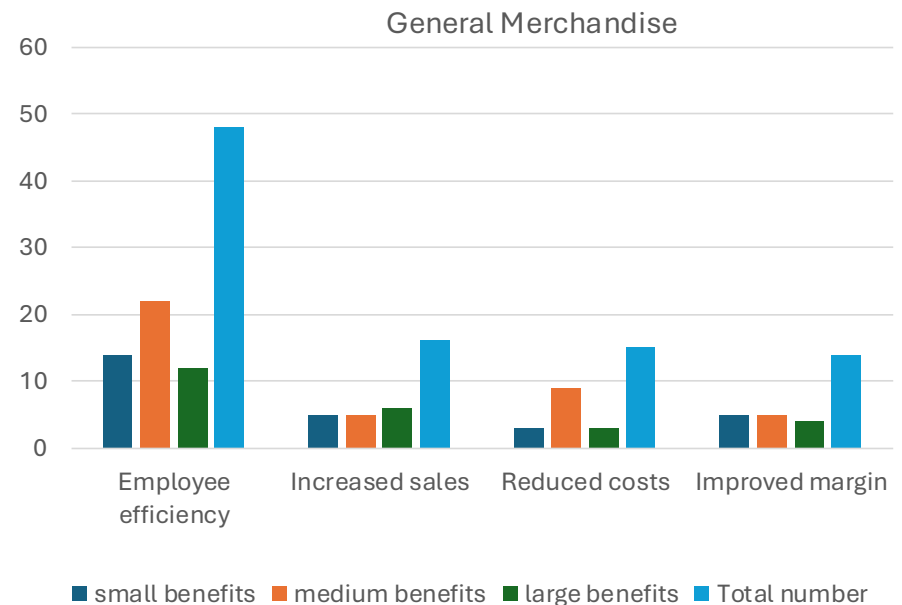
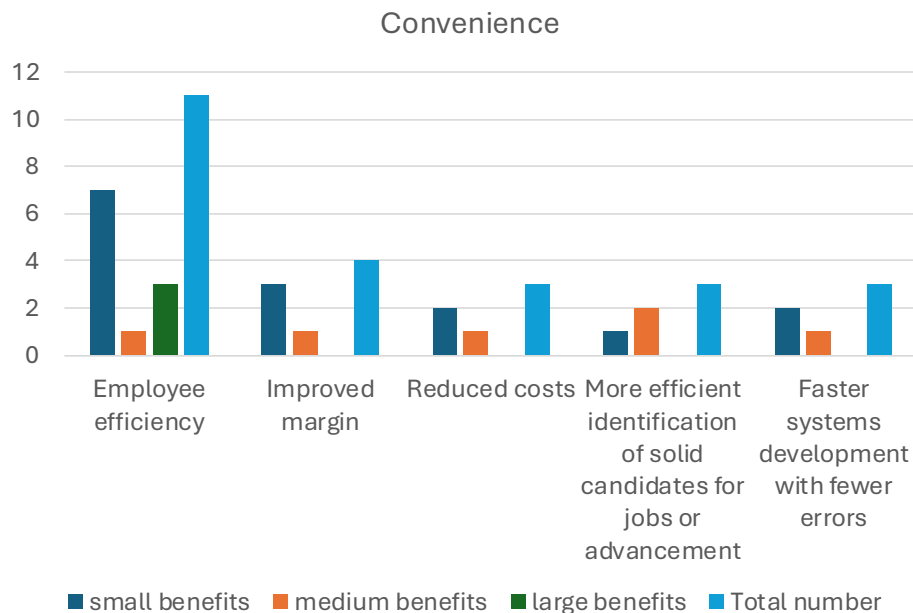
Both convenience and general merchandise have substantial plans for expansion of AI in the next three years.

Areas of the business they expect to do more in the next three years



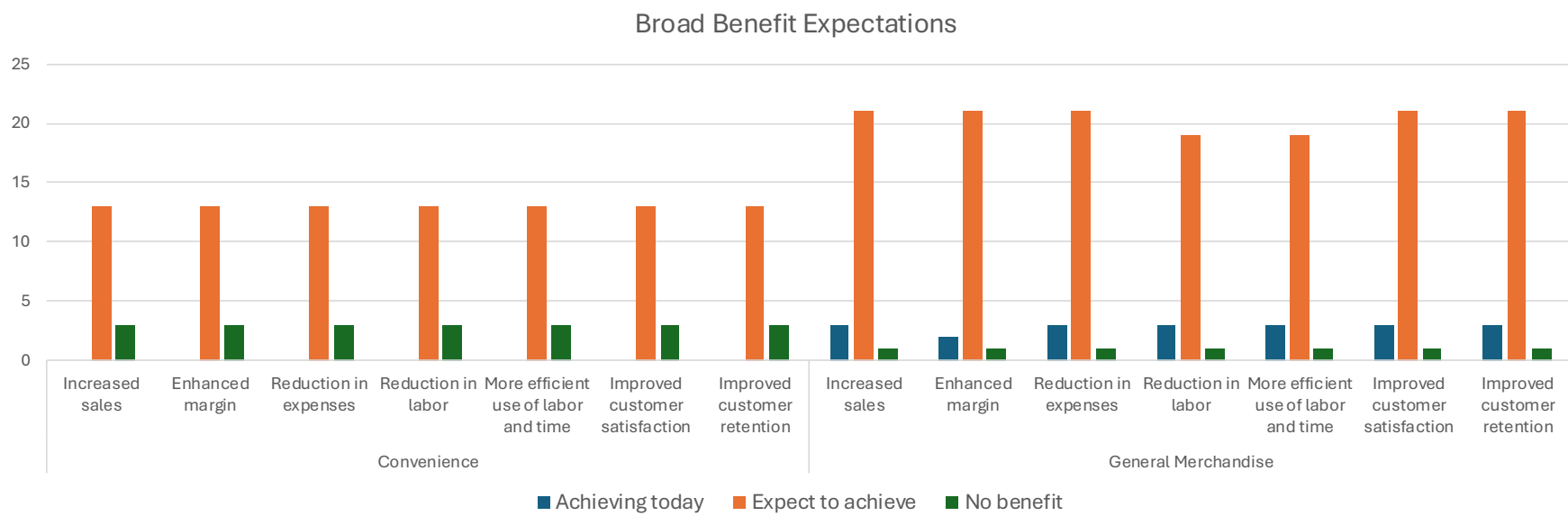
- Convenience is focusing on expanding into areas where general merchandise is more active today.
- General merchandise is adding more back-office type areas while continuing to increase in customer focused and marketing areas.

Employee efficiency is the largest benefit area for both convenience and general merchandise.

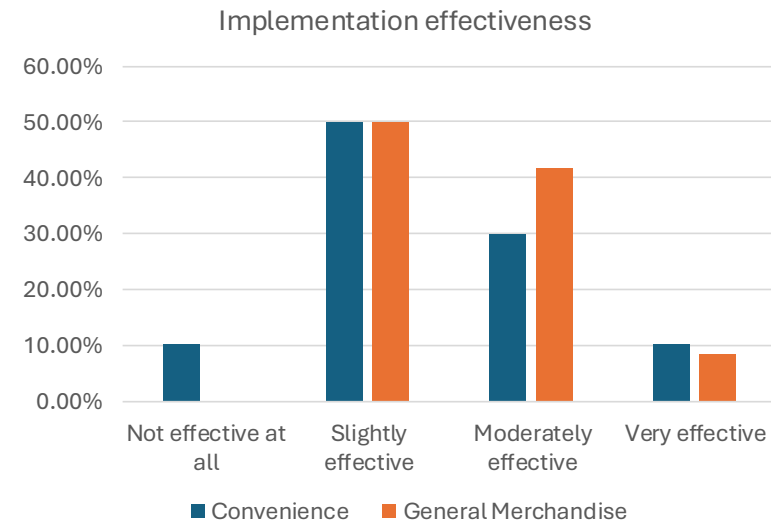
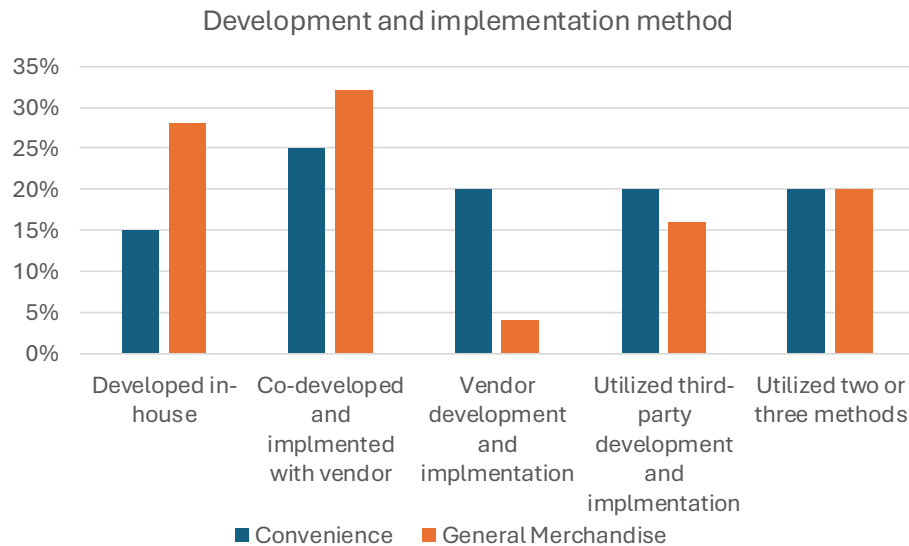


- General merchandise has more areas with large benefits.
- Convenience should explore if there are opportunities to increase the size of the benefits they are obtaining

Only general merchandise is achieving benefits broadly and is less pessimistic about benefits generally.

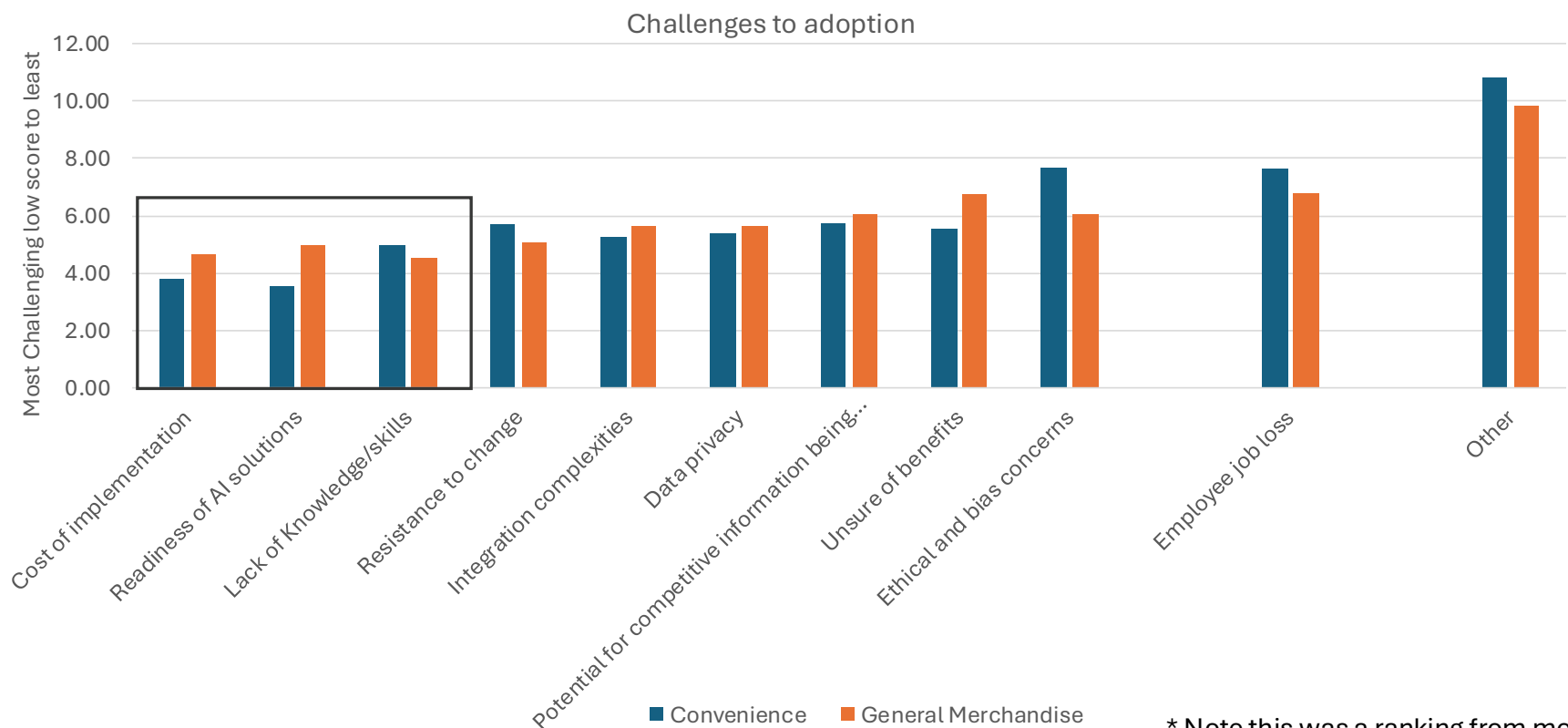


Convenience and general merchandise have different approaches to development and implementation with general merchandise achieving a more effective implementation.



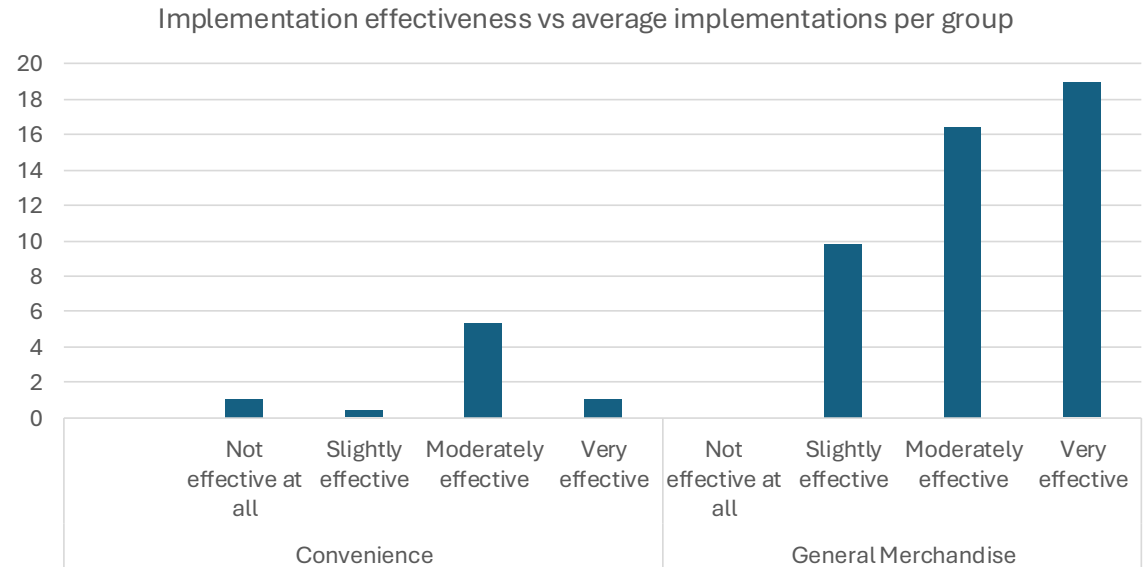
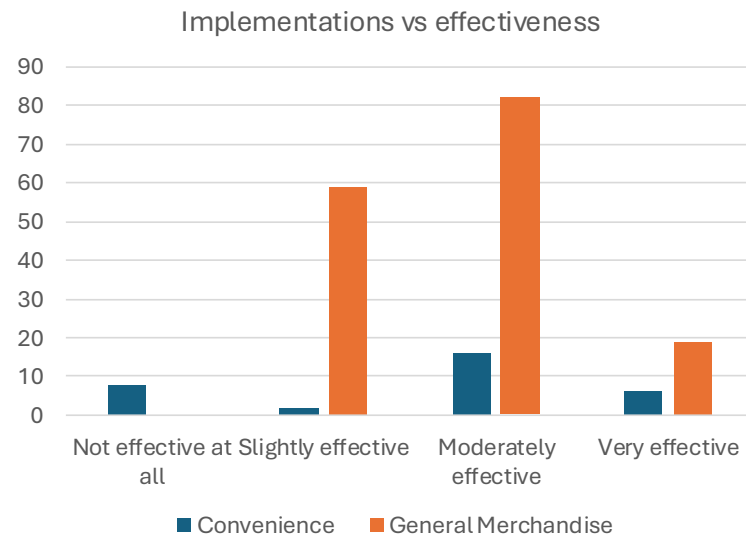
General merchandise's great focus on non-vendor implementation seems to be more effective likely due to their knowledge of the business being integrated more effectively in the implementation

Both retailers believe the three biggest challenges to adoption are cost of implementation, readiness of AI solutions and lack of knowledge and skills.*



* Note this was a ranking from most challenging to least.

Implementations were more moderately effective than not at all or slightly. As companies did more implementations the effectiveness increases.



Developed by taking the average number of implementations for companies who rated the effectiveness of the Implementation in each group



Next steps for the research

- Distribute the results to the respondents to date
- Increase the number of respondents – I need your help here
- Analyze the expanded data
- Create a new presentation
- Write a research paper

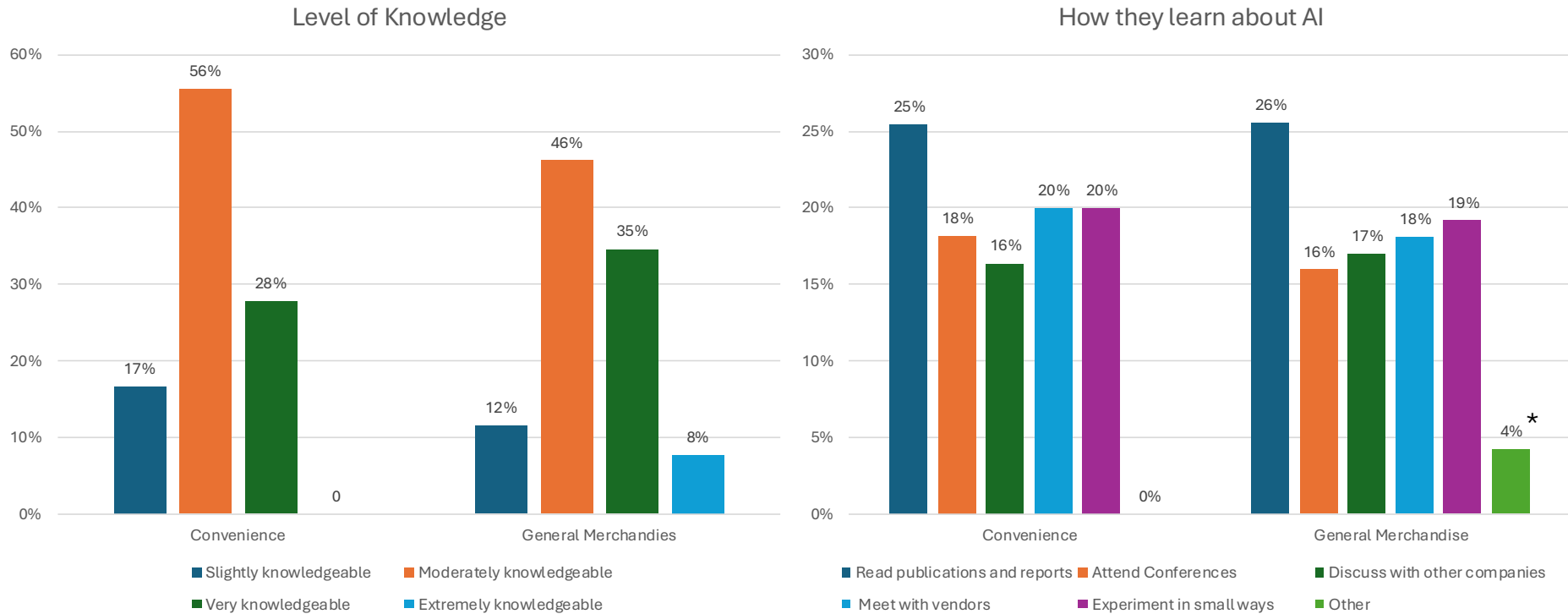


Appendix One

Additional slide on Convenience and General Merchandise

General views on knowledge level and importance for the future

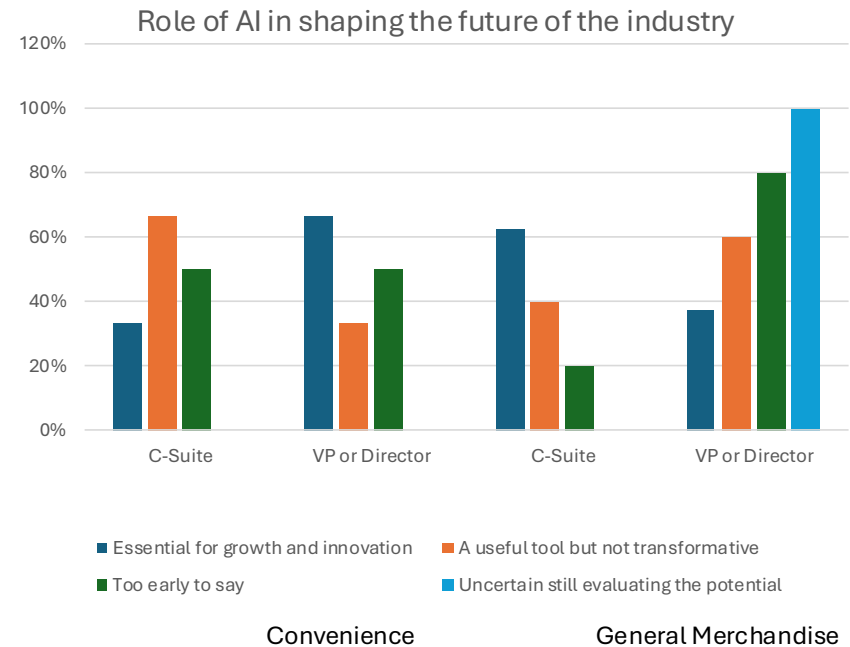
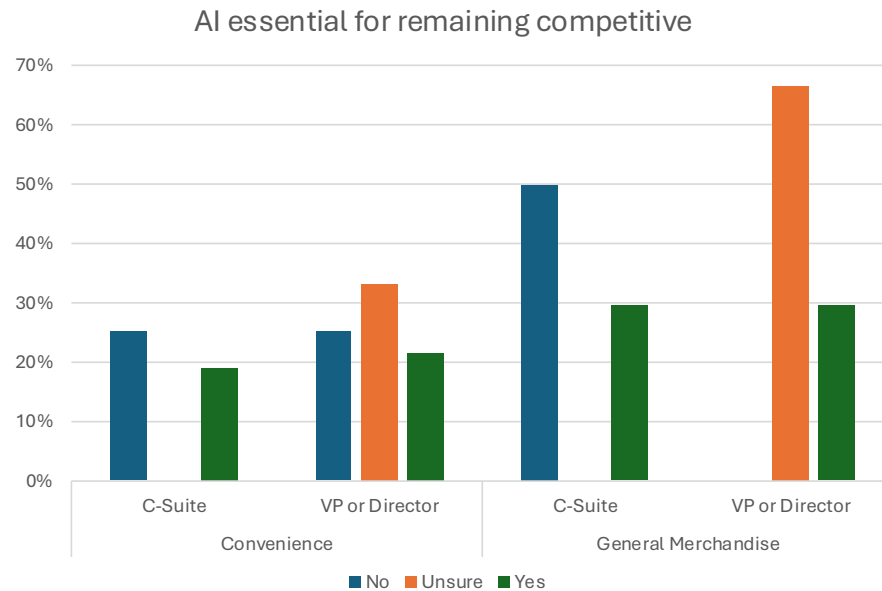
General merchandise a higher percentage of companies who are very or extremely knowledgeable.



- The difference is likely a result of the more implementations general merchandise has.
- The methods of learning about AI are basically the same.

* Includes Retail AI Council and building and using LLMs

AI essential for remaining competitive

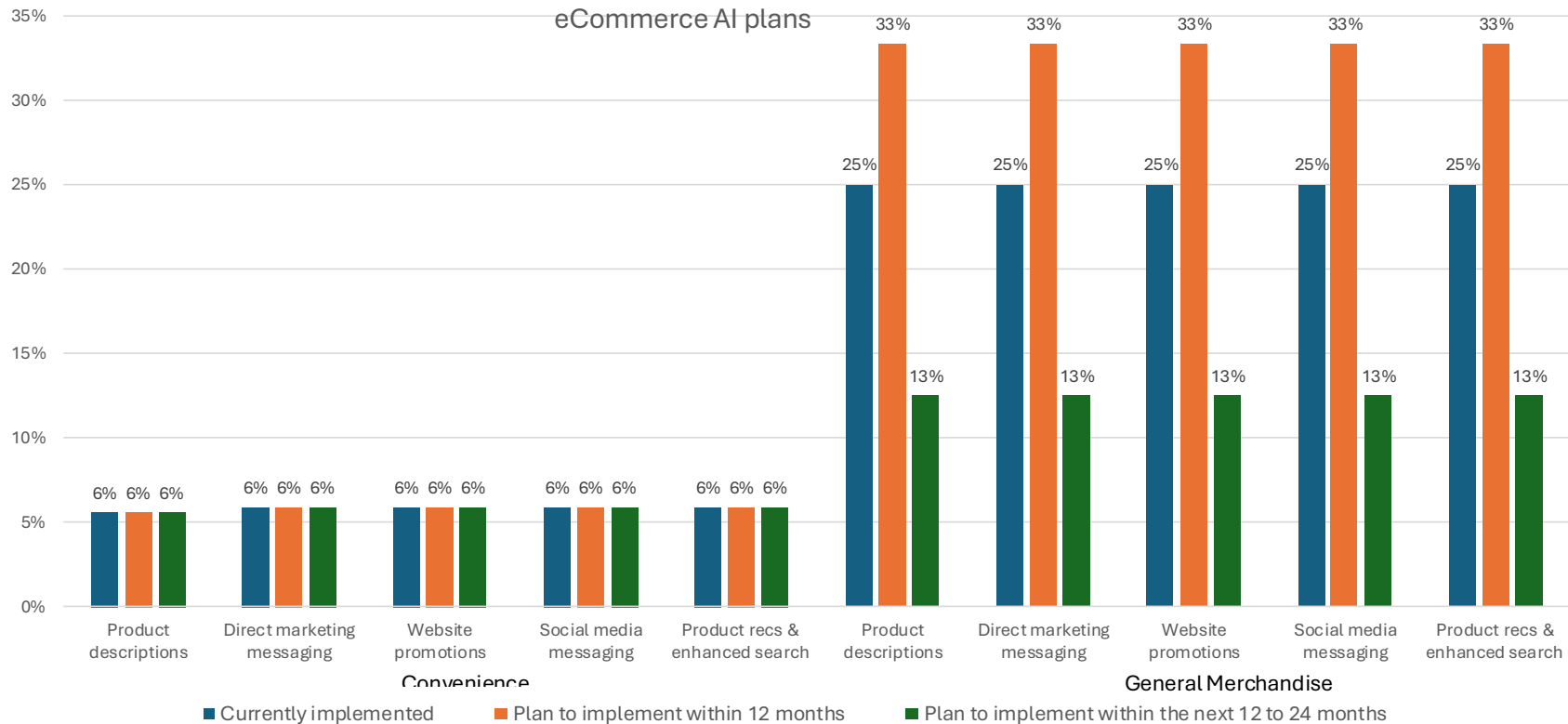


- The C-suite is consistent in believing AI is essential for remaining competitive.
- Convenience C-Suite believe it is a useful tool but not transformative, while VP or Directors are more positive on it being essential for growth.
- General merchandise C-suite is more positive on it being essential for growth and innovation, while VP or Directors are more positive on it being a useful tool but not transformative.

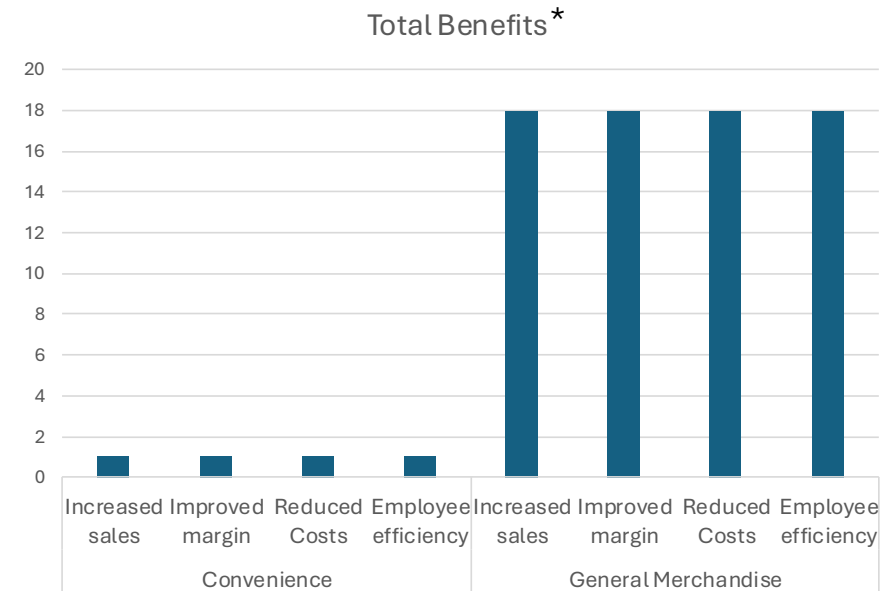
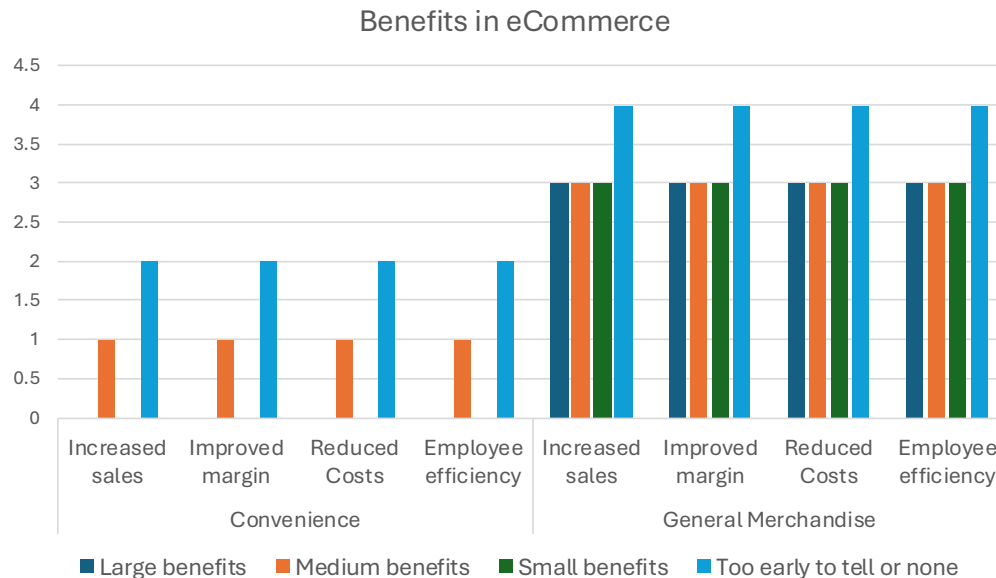
Major areas of the business

What is being done and benefits being achieved

Given most general merchandise retailers are omni-channel. The focus on eCommerce is logical both for the current and future.

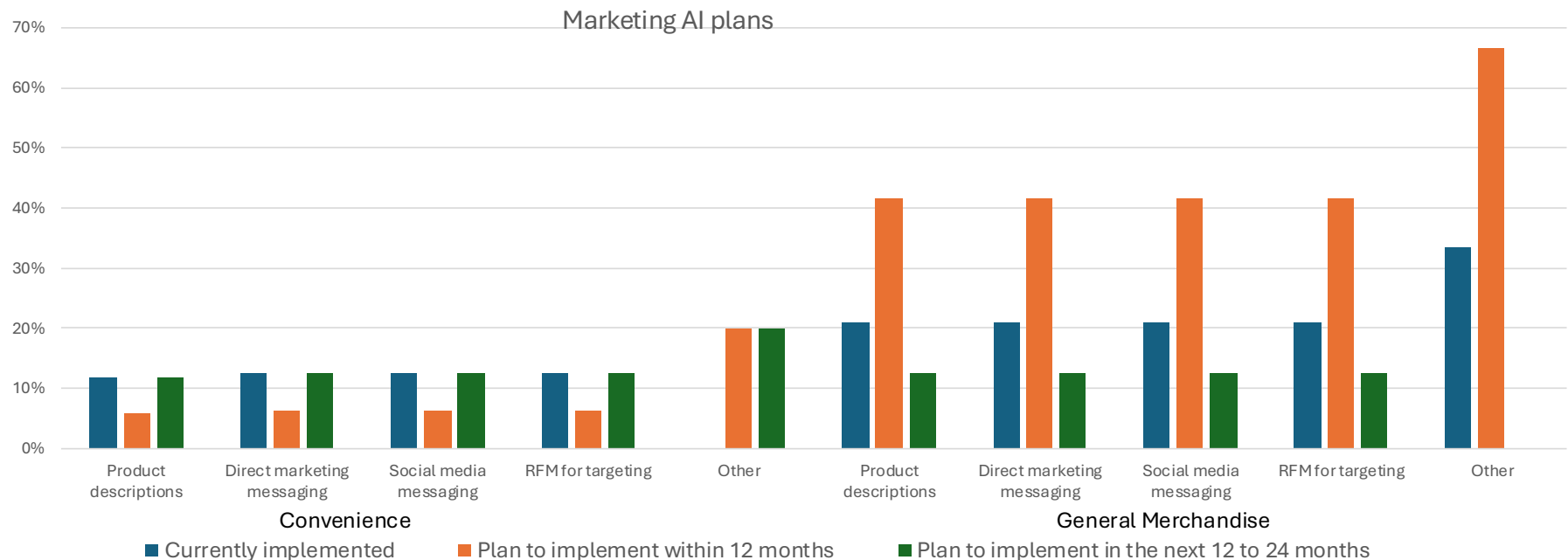


eCommerce benefits are in all areas and size range of benefits



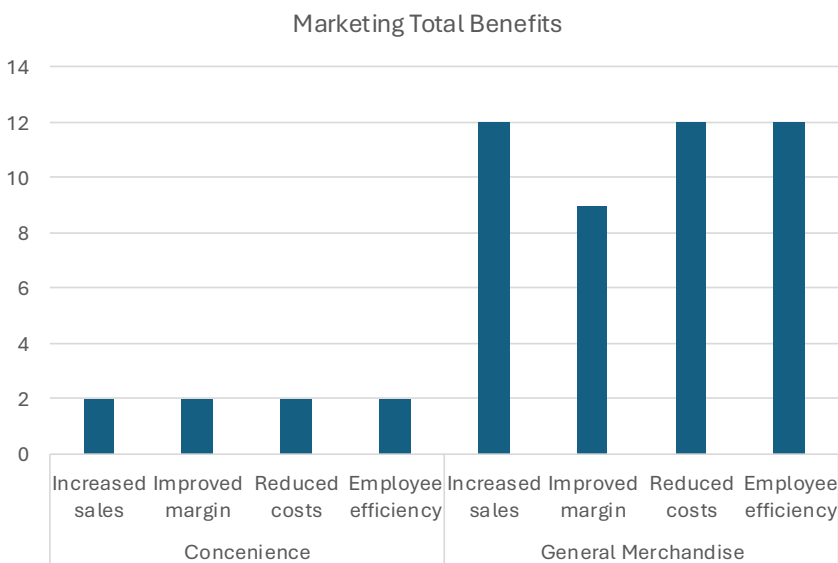
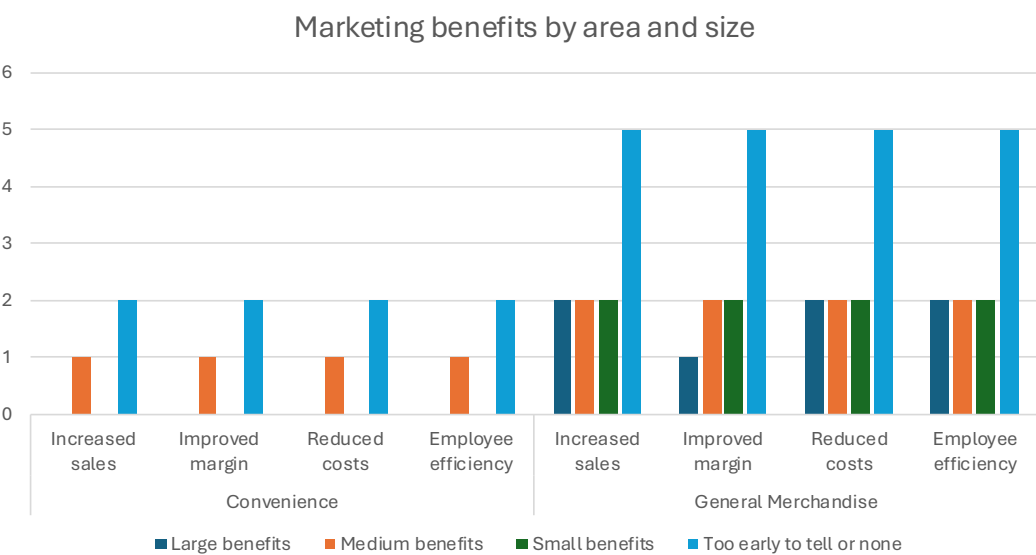
* Total benefits are calculated as small benefits as 1, medium benefits as 2 times and large as 3 times for a proxy grand total

Convenience might want to learn more about the marketing AI uses in general merchandise do see if there are opportunities



Customer responses and feedback is the other mentioned. Others had plans but did not specify the area.

Both types of retailers have substantial areas in marketing where it is too early to identify the benefits.

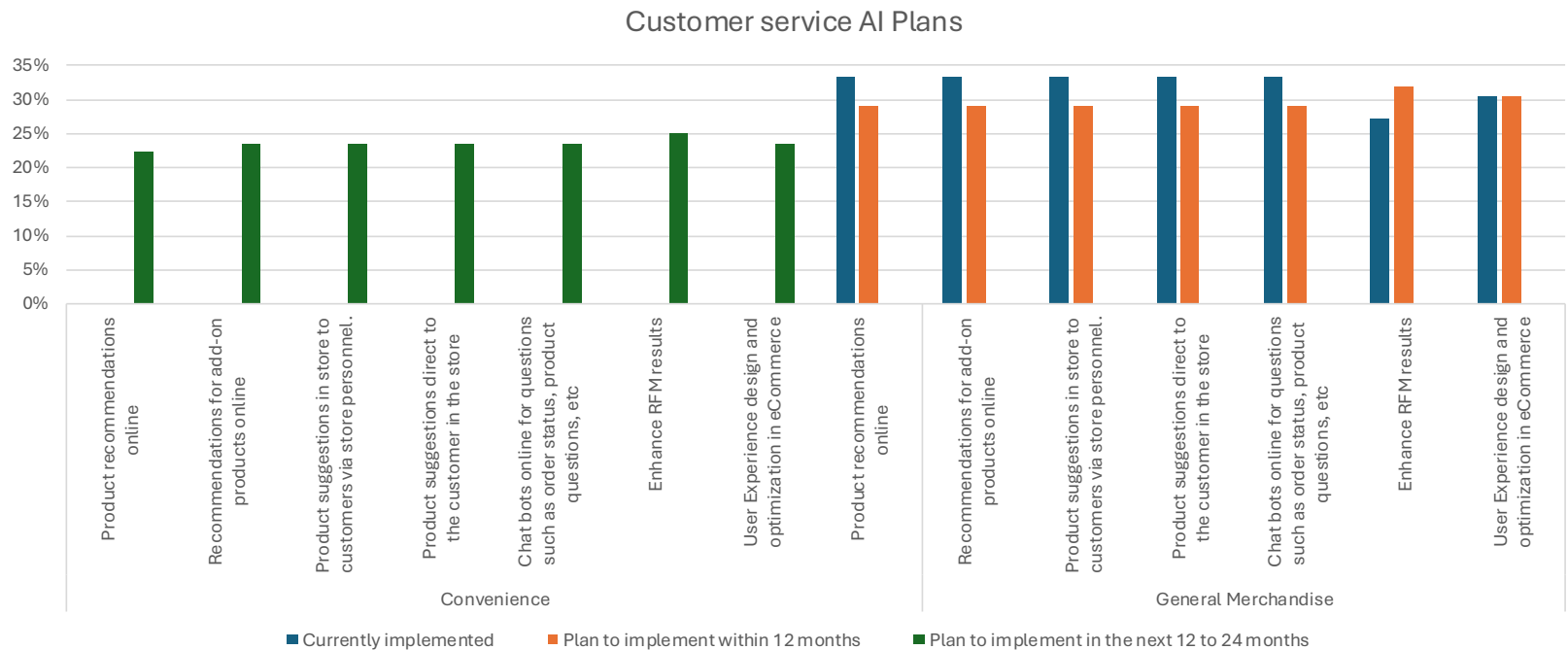


General merchandise has more large benefits. Convenience may have an opportunity to learn from them

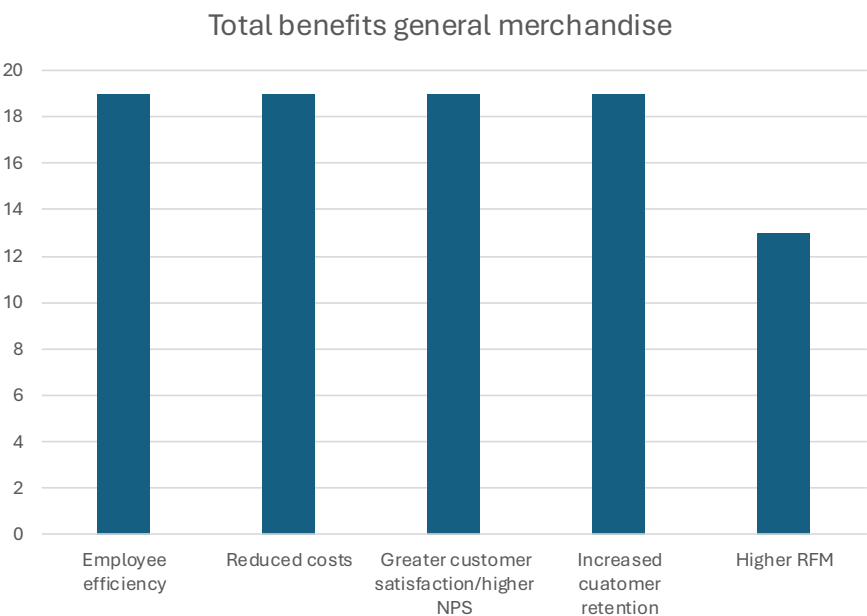
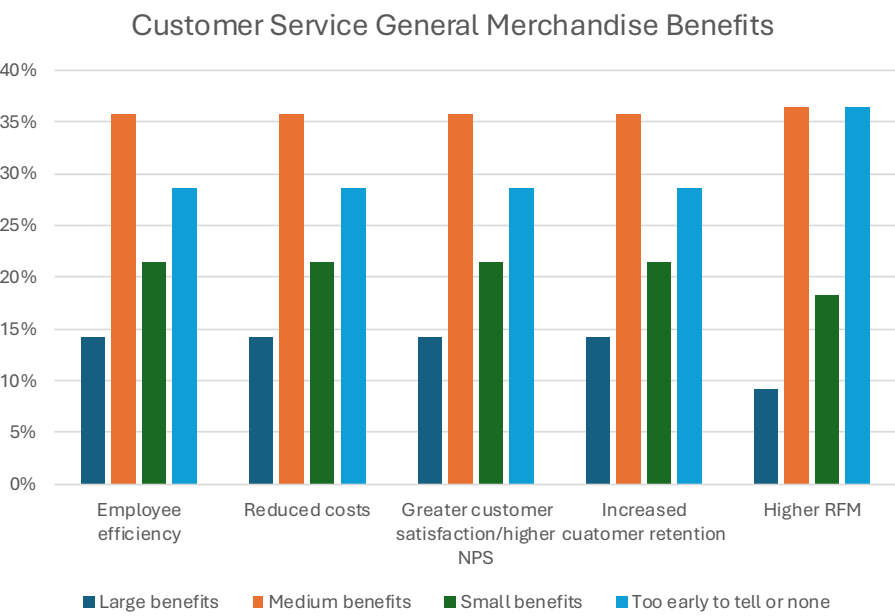
* Total benefits are calculated as small benefits as 1, medium benefits as 2 times and large as 3 times for a proxy grand total

General merchandise has more current customer service implementations with more planned. Convenience stores can explore to see what ideas might be good for them

- Product recommendations online
- Recommendations for add-on products online
- Product suggestions in store to customers via store personnel.
- Product suggestions direct to the customer in the store
- Chat bots online for questions such as order status, product questions, etc.
- Enhance RFM results
- User Experience design and optimization in eCommerce



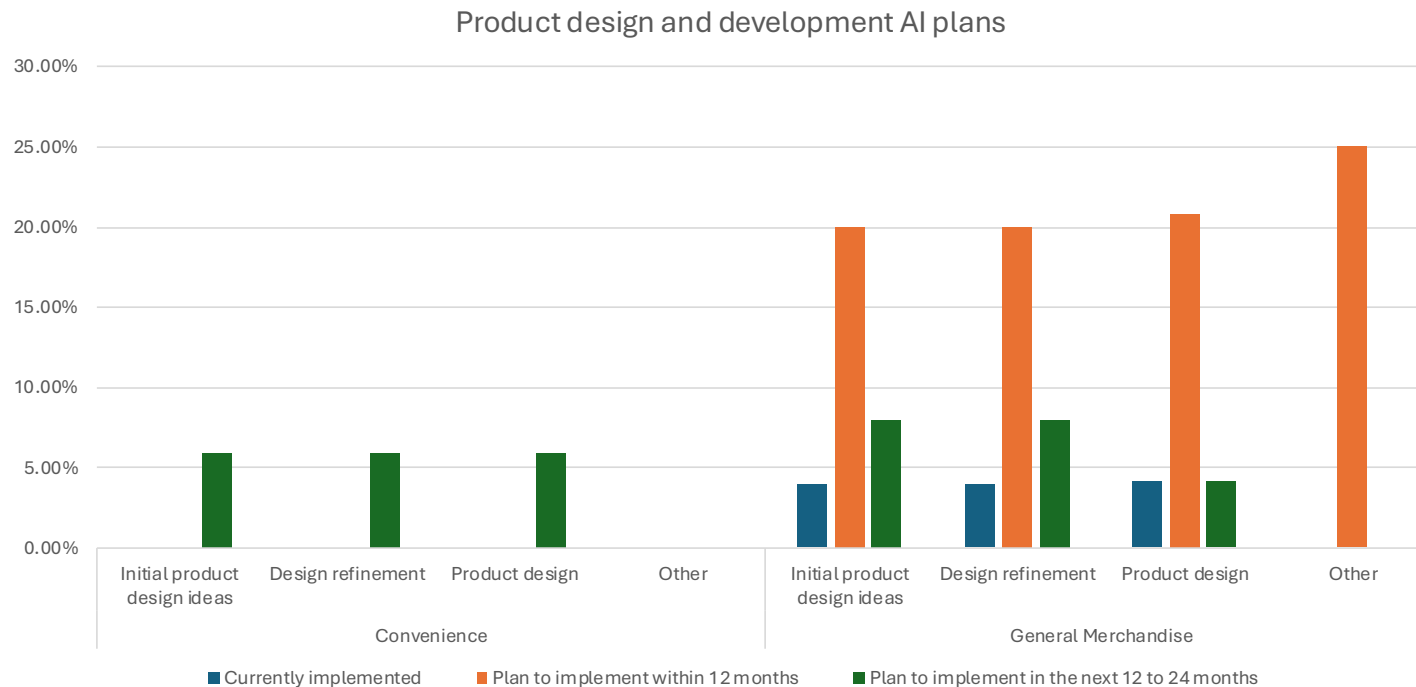
Customer service benefits



Note: There are no convenience implementations in this area

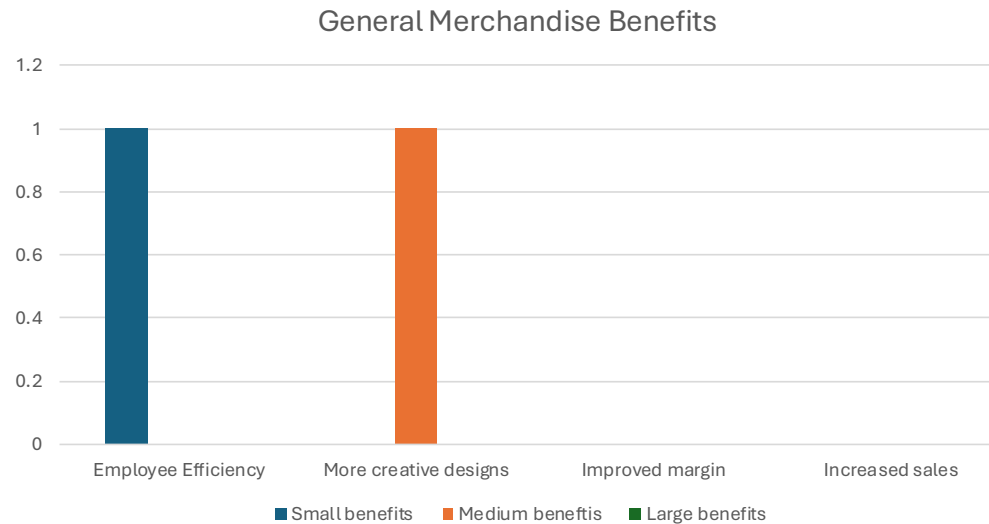
* Total benefits are calculated as small benefits as 1, medium benefits as 2 times and large as 3 times for a proxy grand total

Convenience has no current or short-term plans for product design and development. Even general merchandise has limited usage.



This is an area which will require more research and experimenting.

General merchandise is obtaining limited benefits.



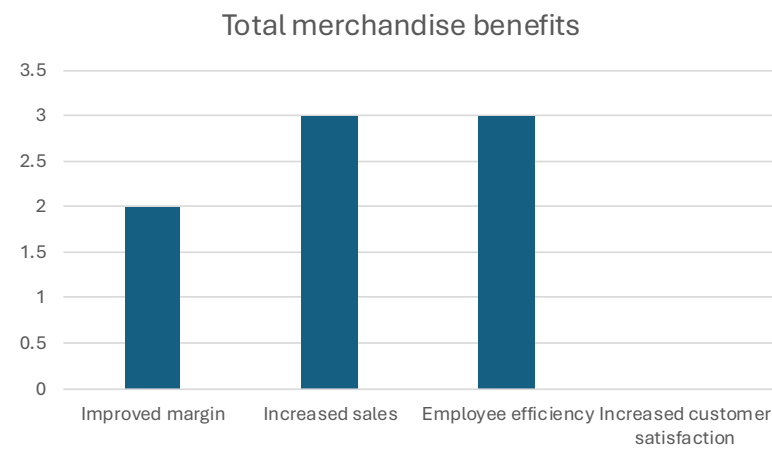
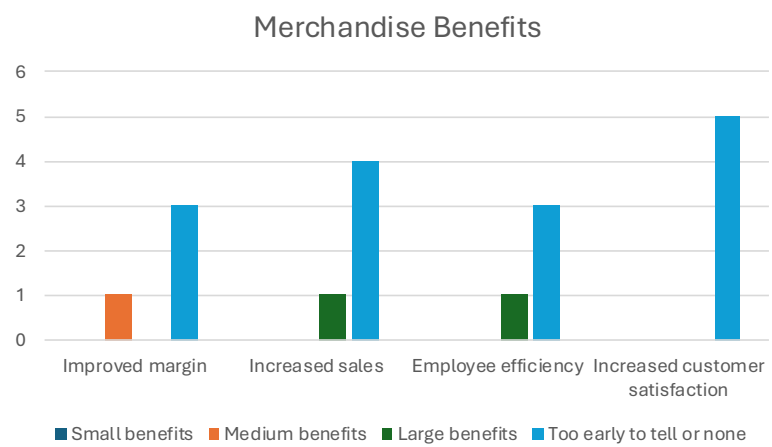
Note: There are no convenience implementations in this area

* Total benefits are calculated as small benefits as 1, medium benefits as 2 times and large as 3 times for a proxy grand total

Merchandising AI plans



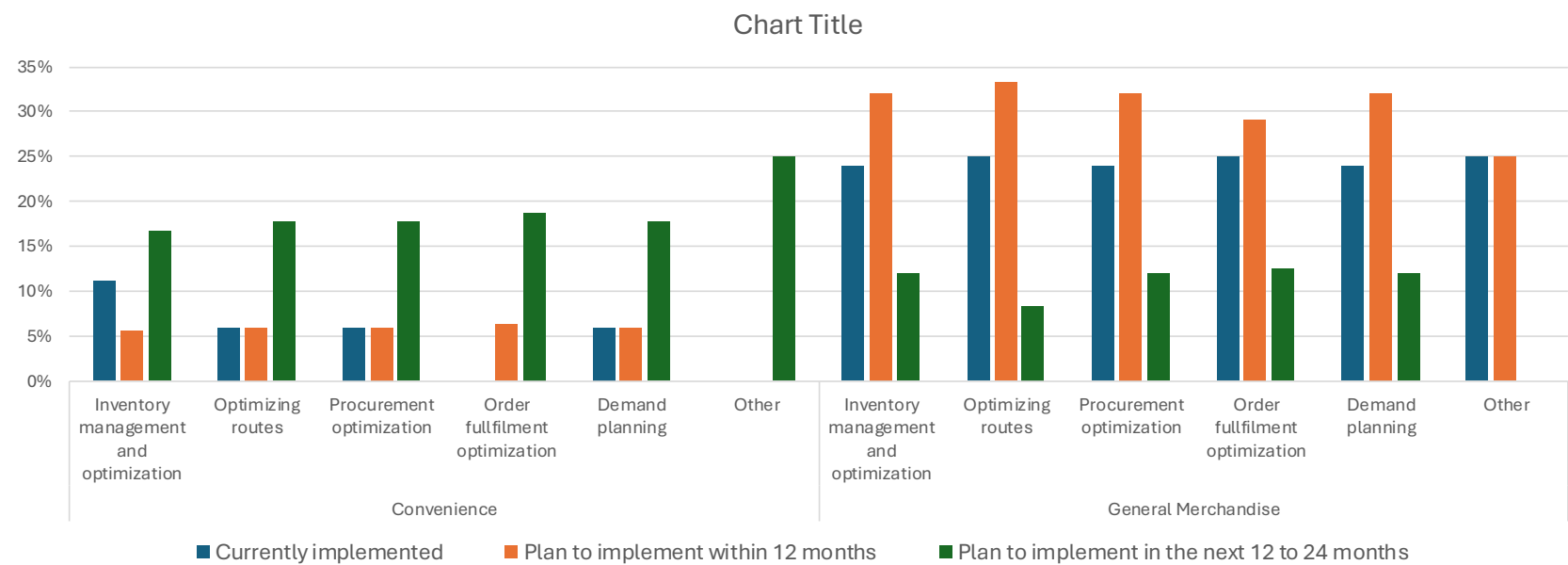
Merchandising benefits



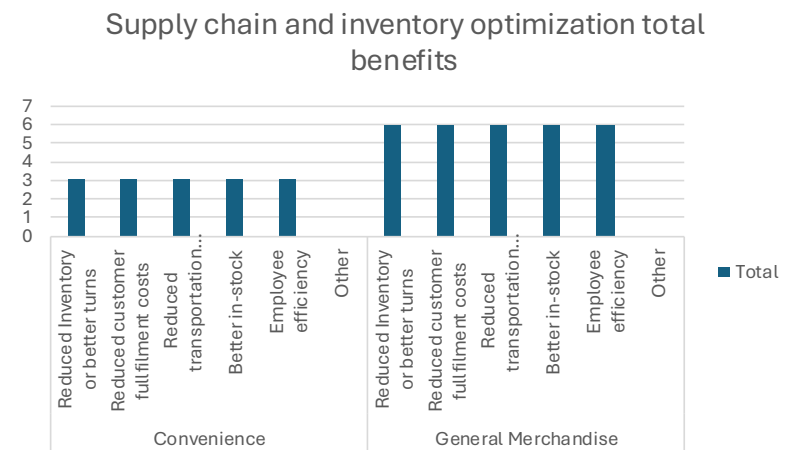
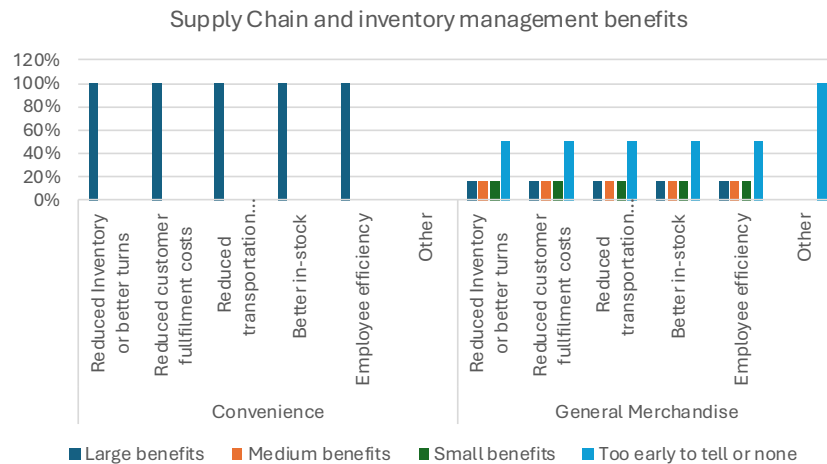
Note: there were no convenience implementations in this area

* Total benefits are calculated as small benefits as 1, medium benefits as 2 times and large as 3 times for a proxy grand total

Supply Chain and inventory management

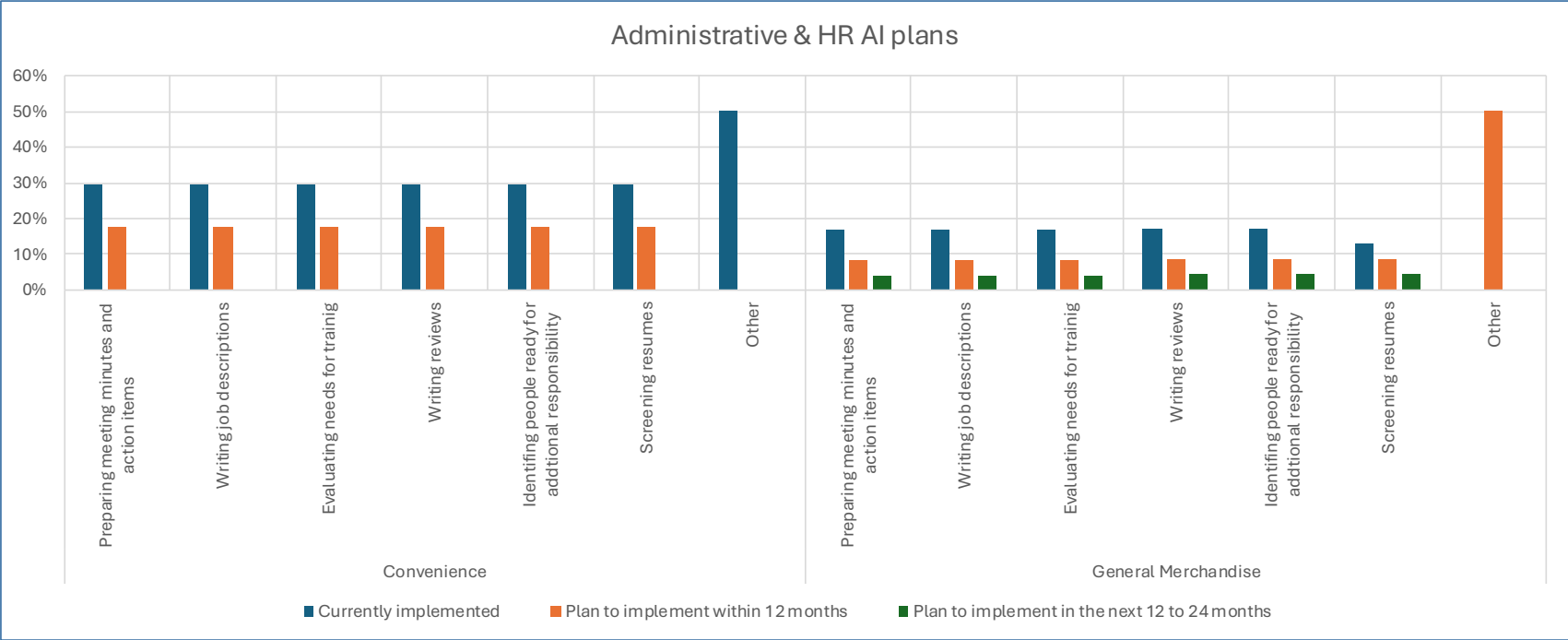


Supply Chain and inventory management benefits

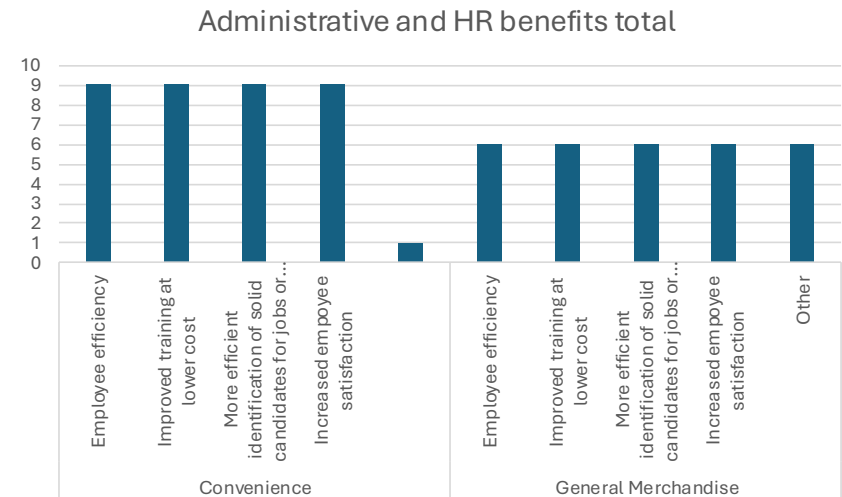
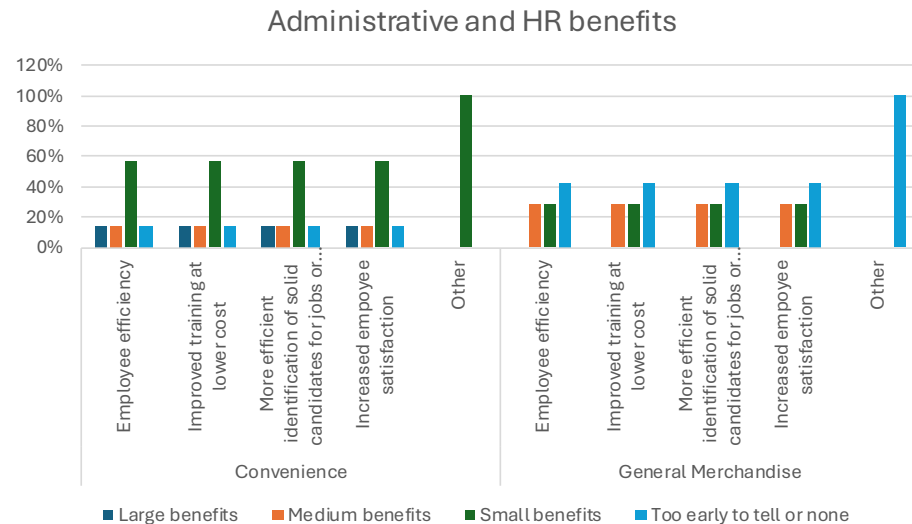


* Total benefits are calculated as small benefits as 1, medium benefits as 2 times and large as 3 times for a proxy grand total

Administrative and HR plans

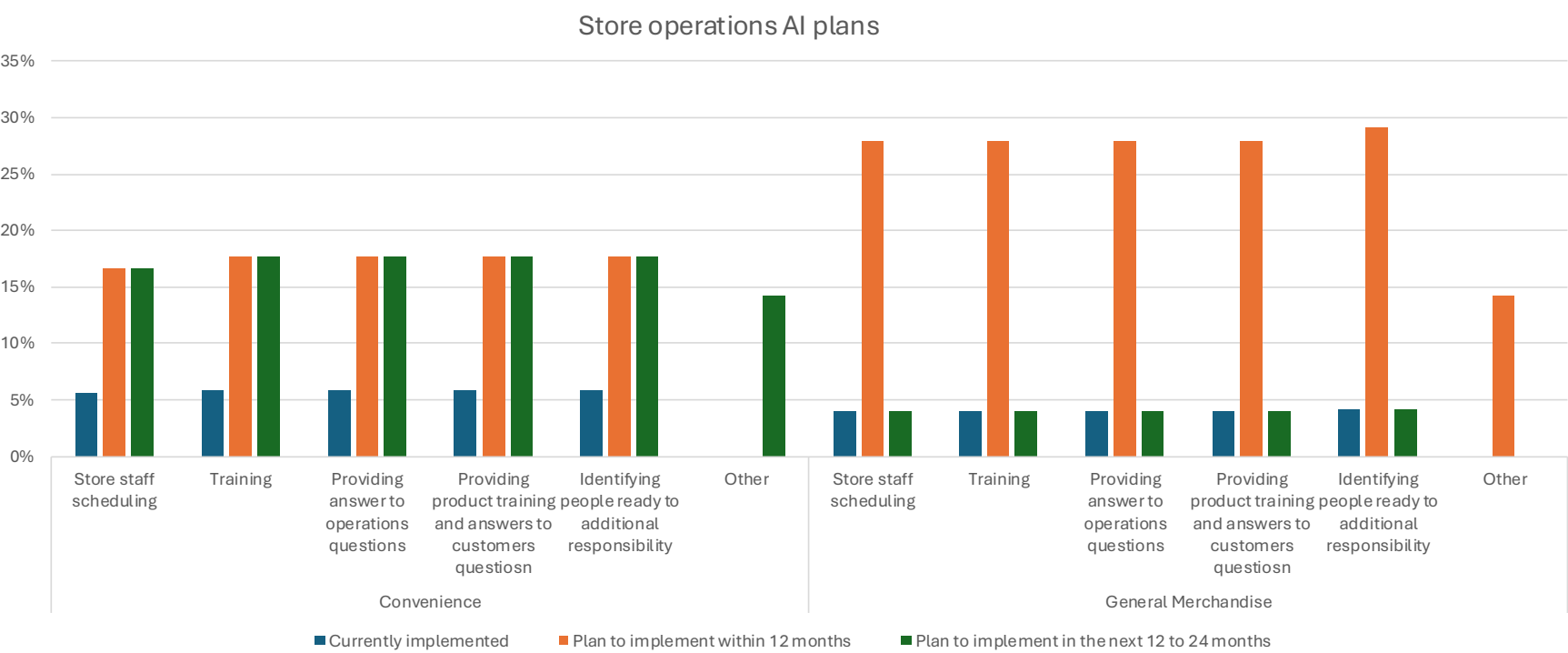


Administrative and HR plans benefits

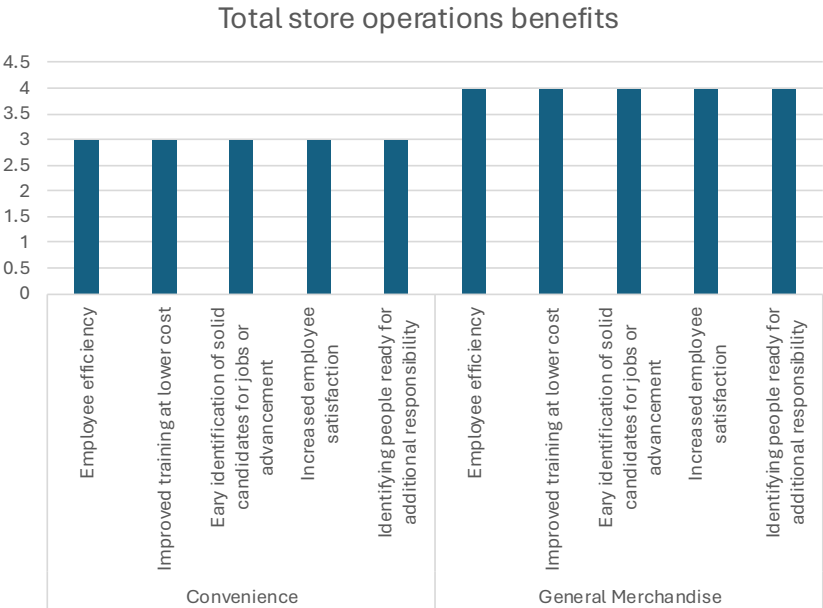


* Total benefits are calculated as small benefits as 1, medium benefits as 2 times and large as 3 times for a proxy grand total

Store operations

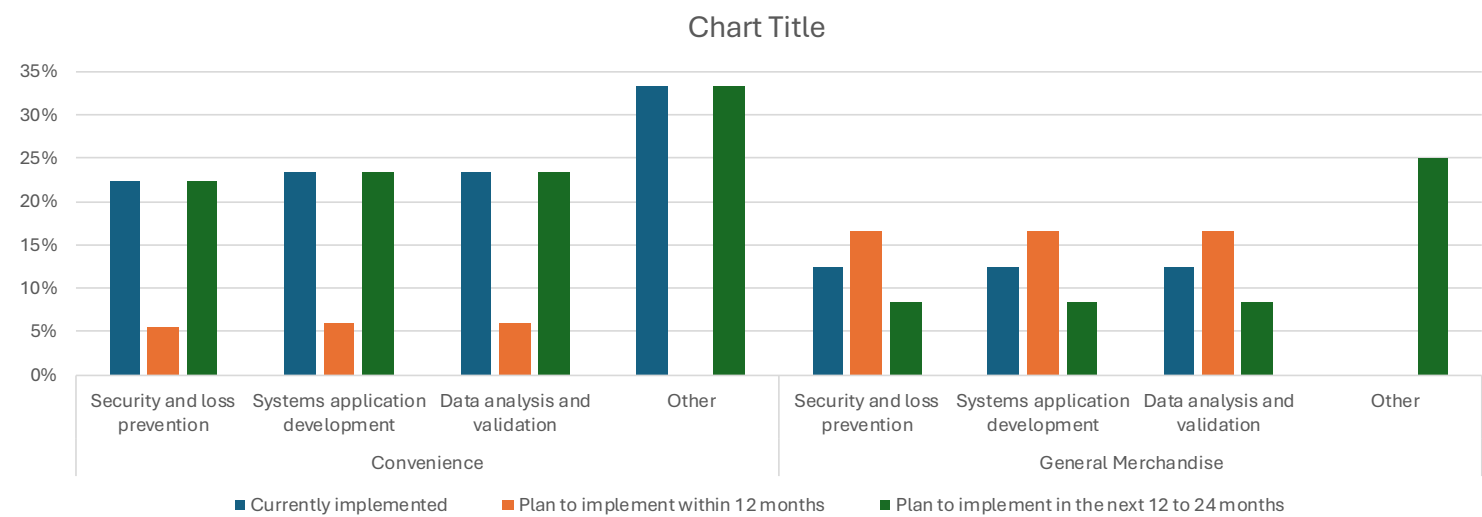


Store operations benefits

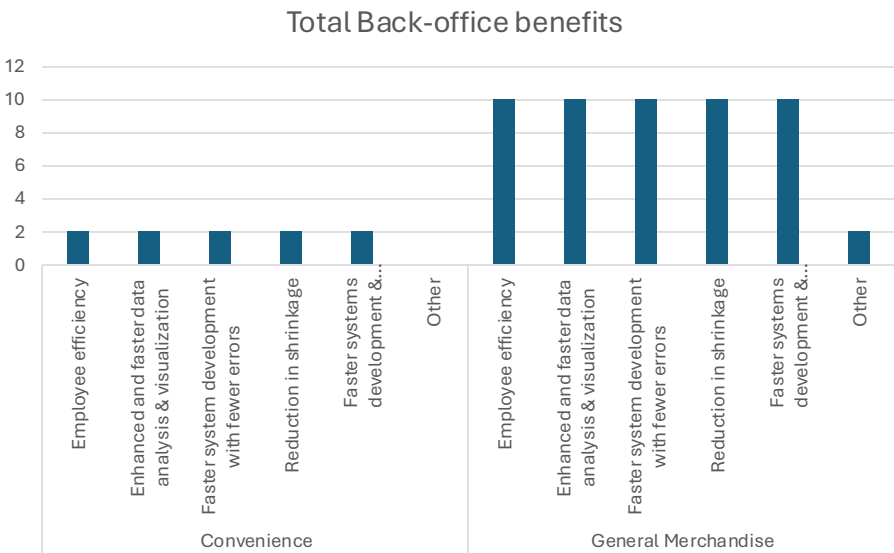
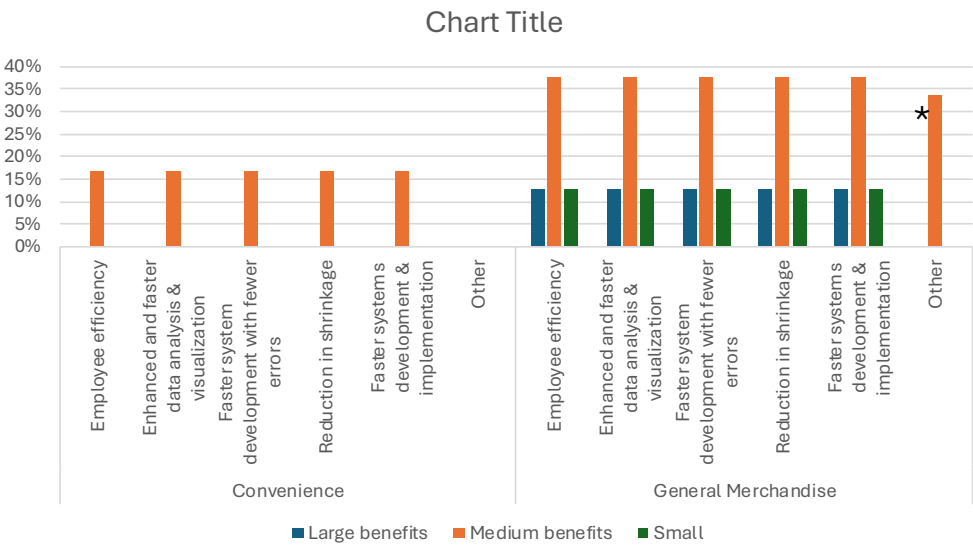


* Total benefits are calculated as small benefits as 1, medium benefits as 2 times and large as 3 times for a proxy grand total

Other Back-office



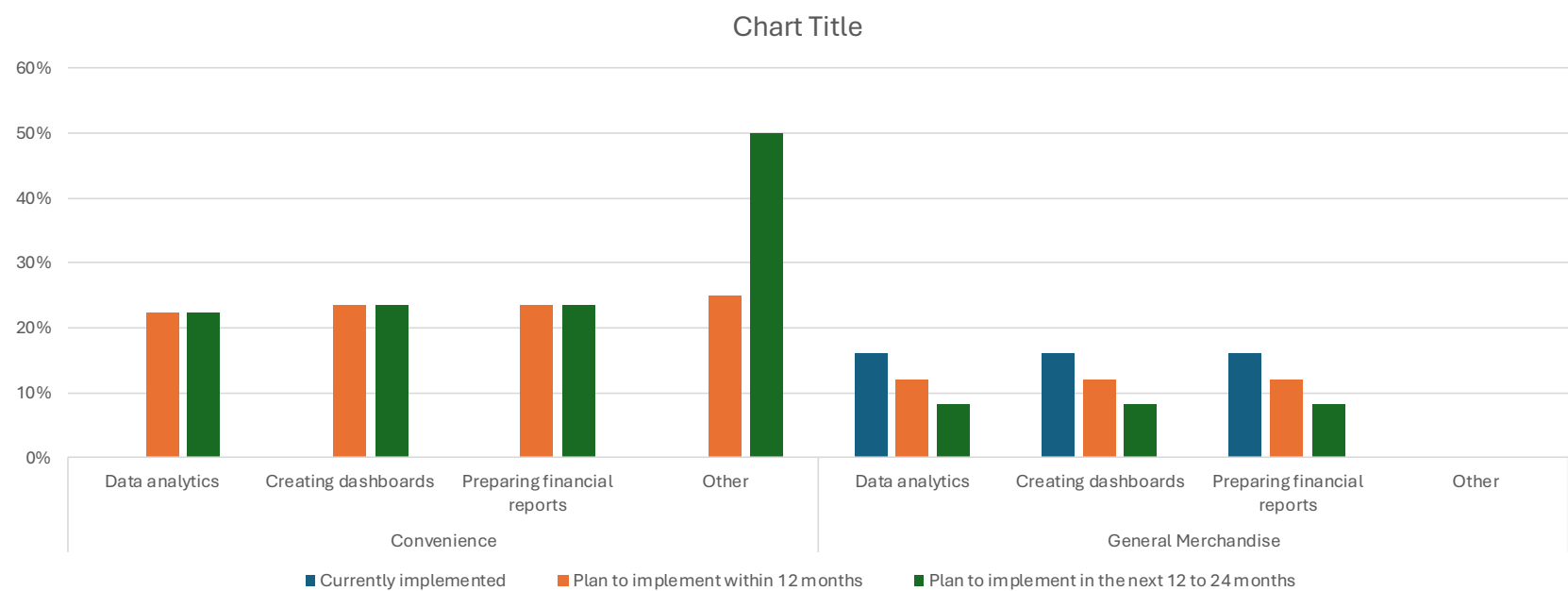
Back-office benefits



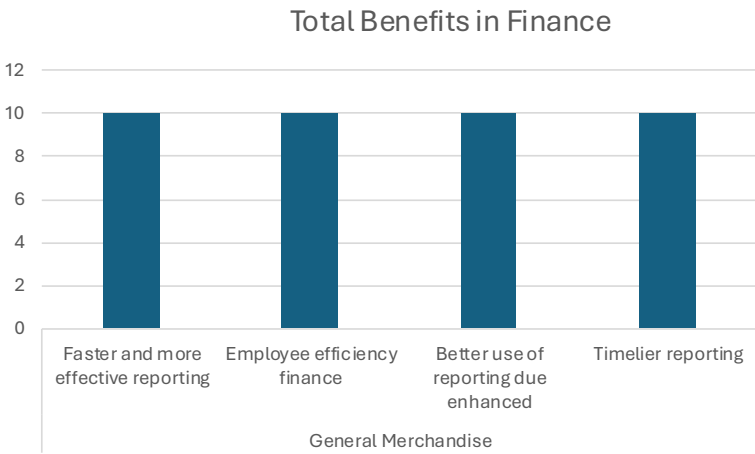
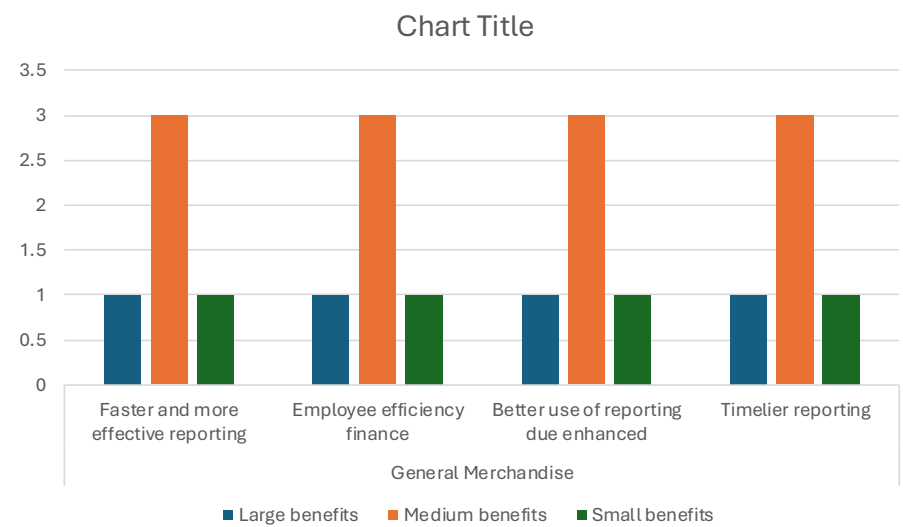
* Other is online fraud prevention

* Total benefits are calculated as small benefits as 1, medium benefits as 2 times and large as 3 times for a proxy grand total

Finance AI plans



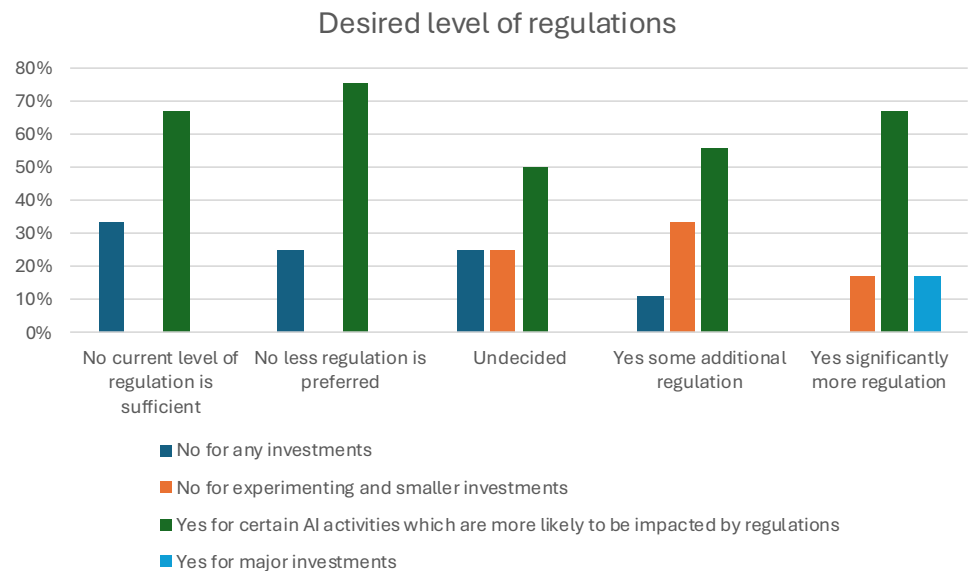
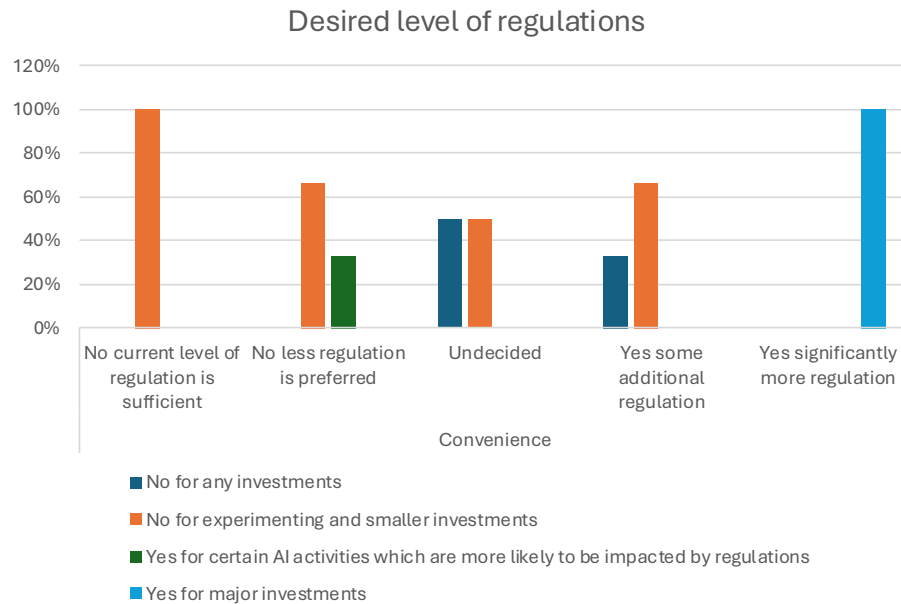
Finance Benefits



Note Convenience has not implemented AI in Finance

* Total benefits are calculated as small benefits as 1, medium benefits as 2 times and large as 3 times for a proxy grand total

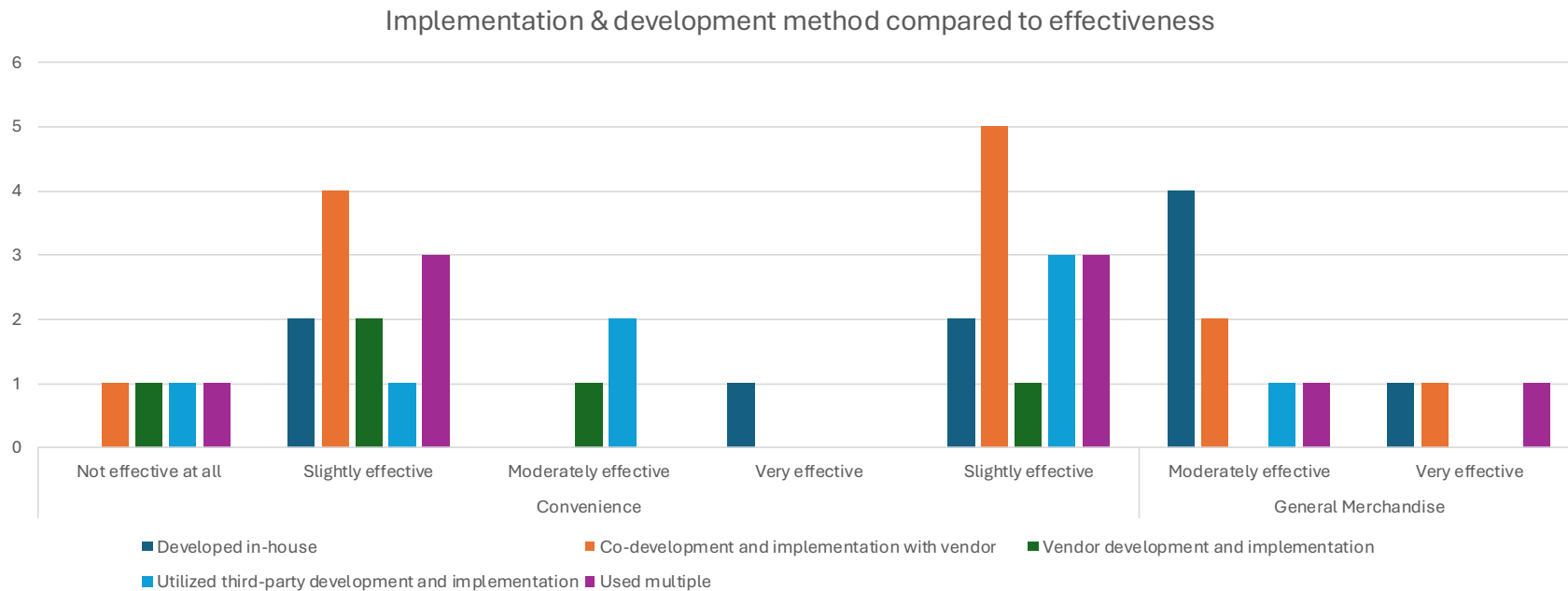
Impact of regulations on decisions compared to level of regulations desired



Implementation experience

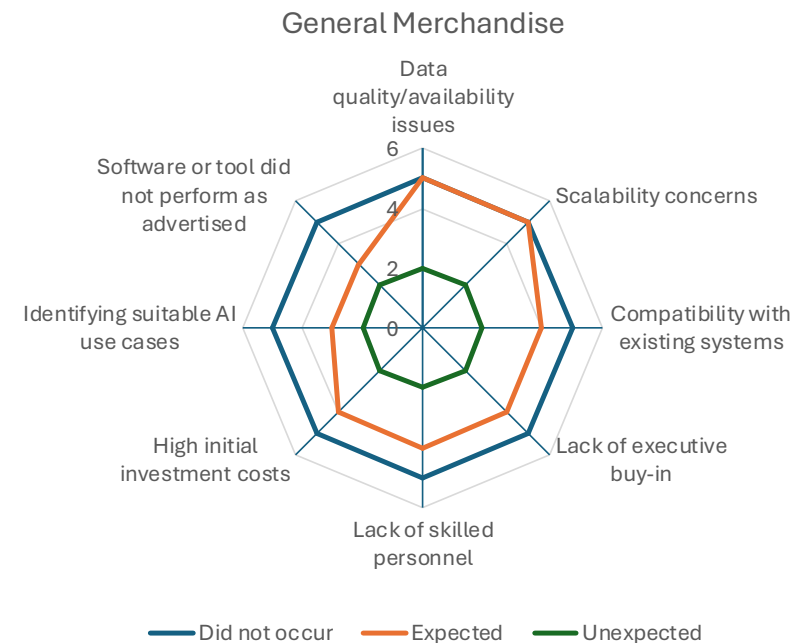
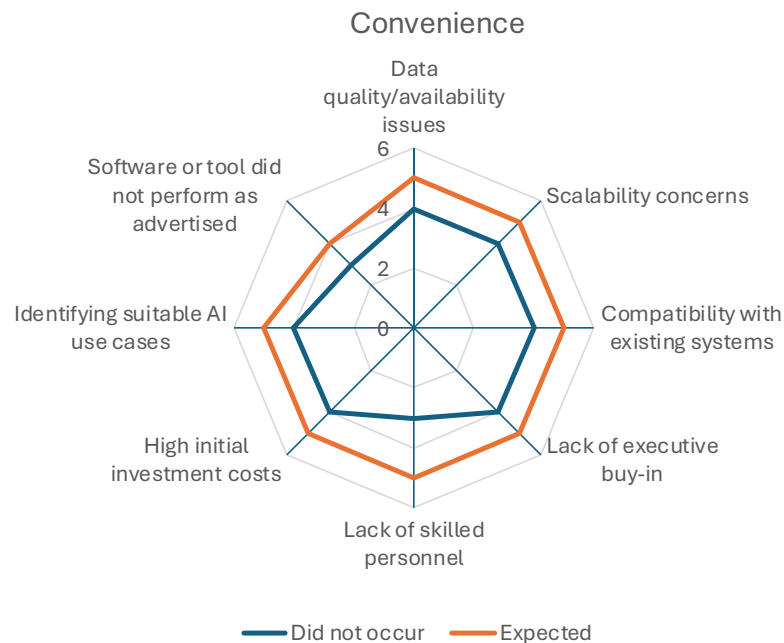
Approaches, challenges, relationship to benefits

Convenience and general merchandise have different approaches to development and implementation



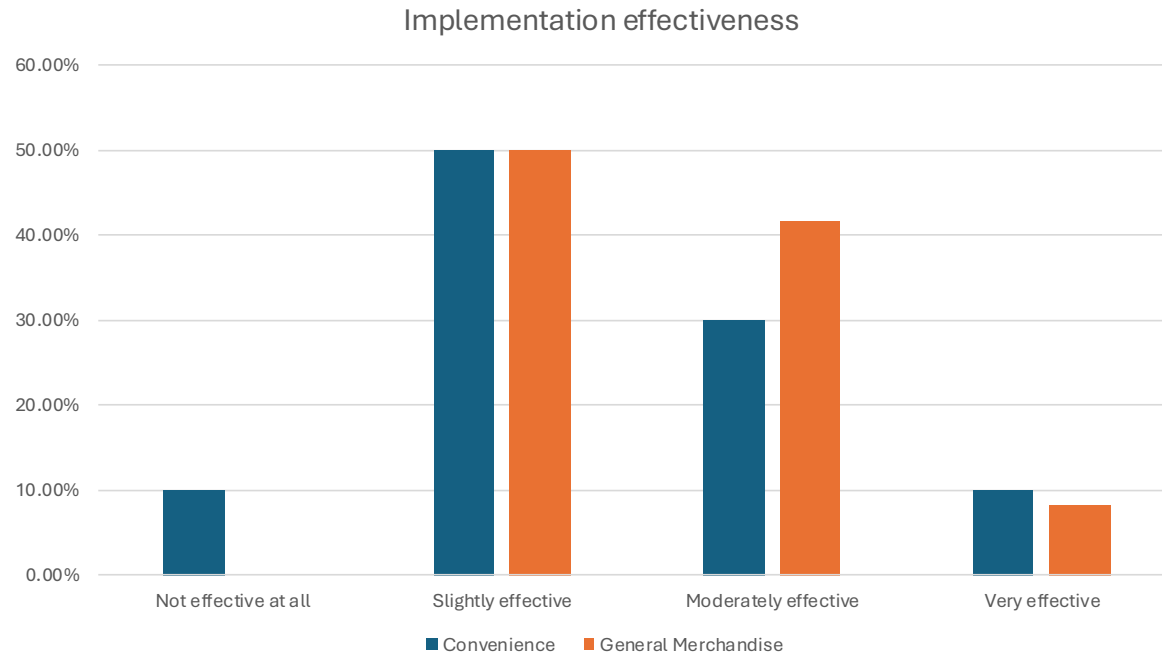
General merchandise has limited usage of vendor development and implementation than convenience.

General merchandise had more challenges that were not expected.

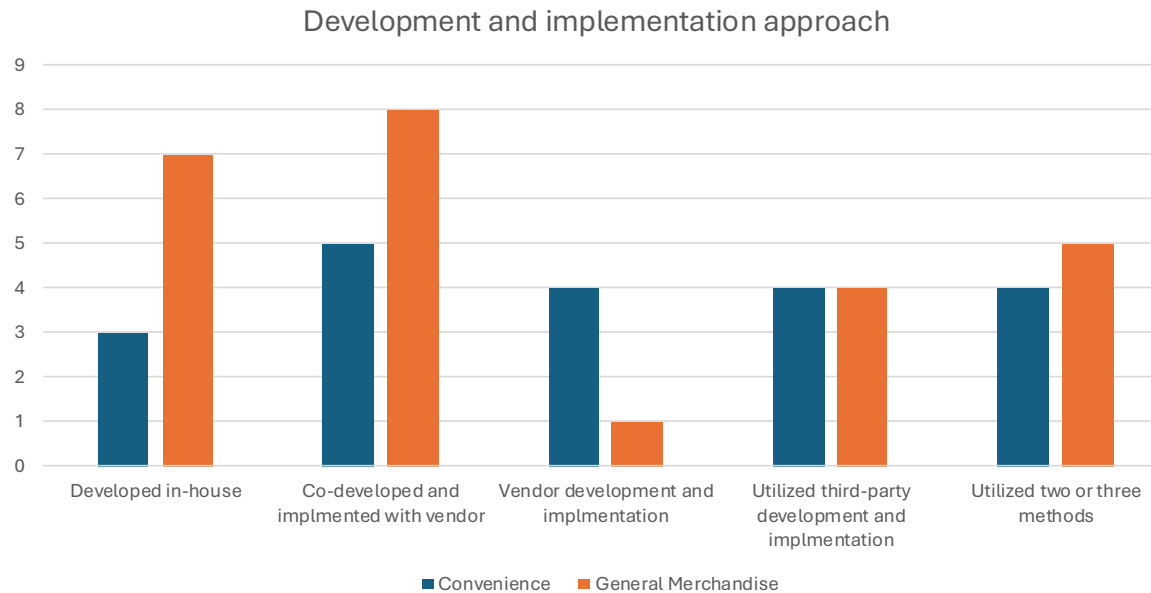


- Convenience had more challenges with identifying suitable use case and software not performing as advertised. The expected lack of skilled personnel did not occur.
- General merchandise had lower expectations for suitable use cases and software not performing and they did not occur.

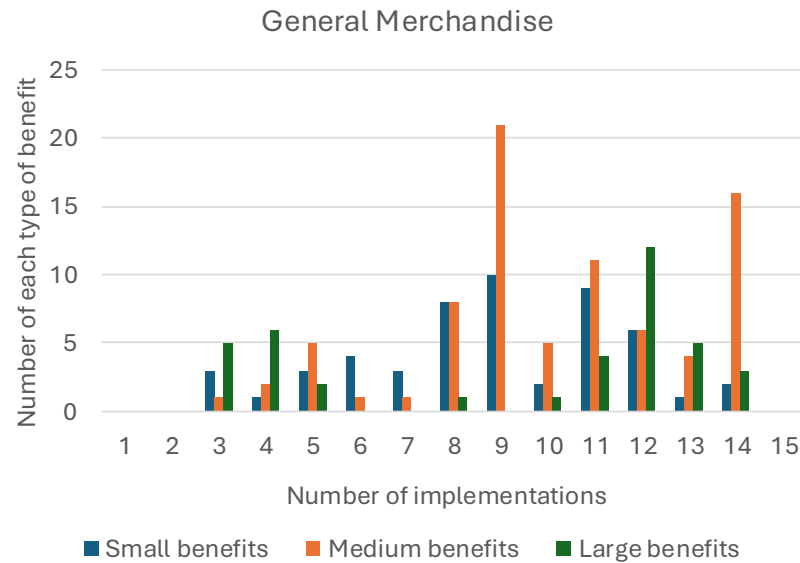
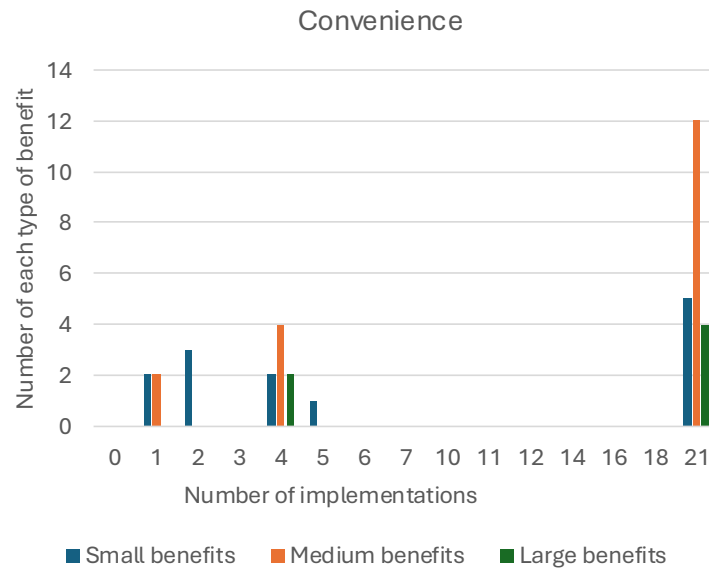
Implementation effectiveness has been greater for general merchandise



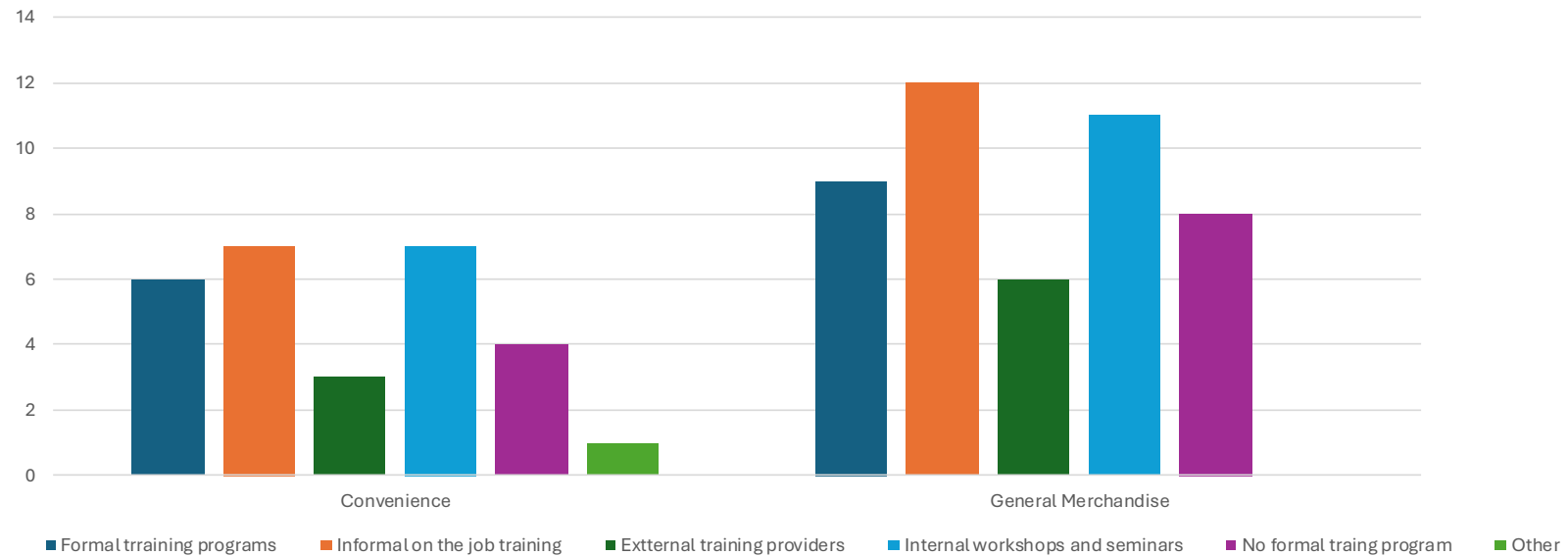
Development and implementation approach



As the number of implementations increased the number of benefits increased and were larger

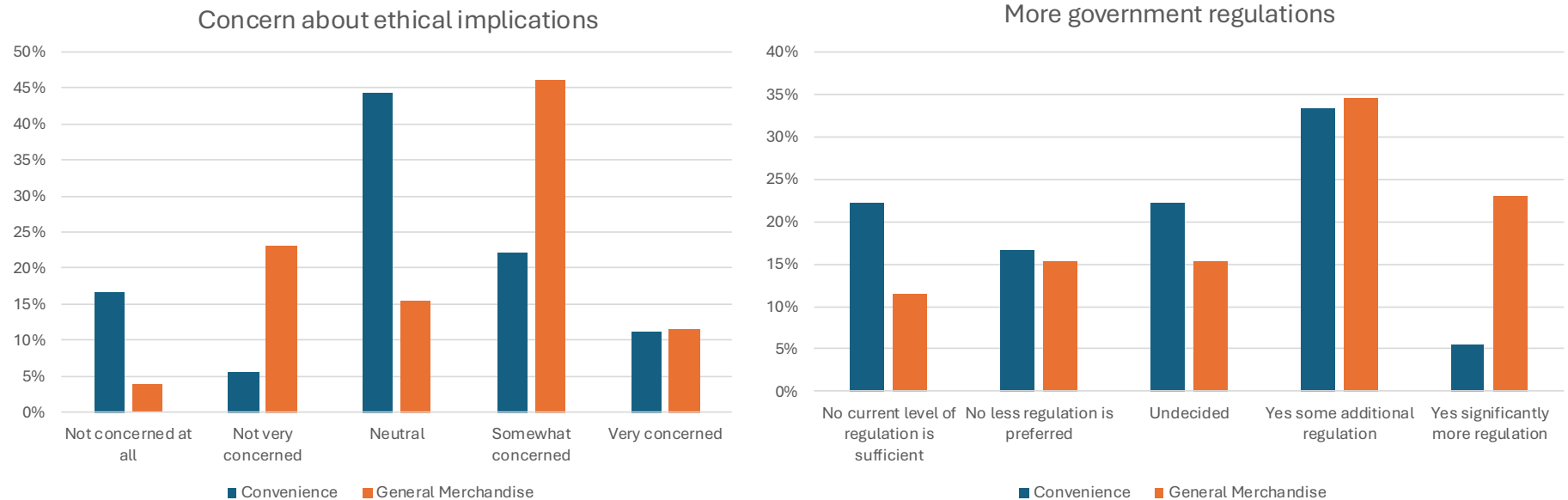


Training approaches have used multiple methods in both types of retailers

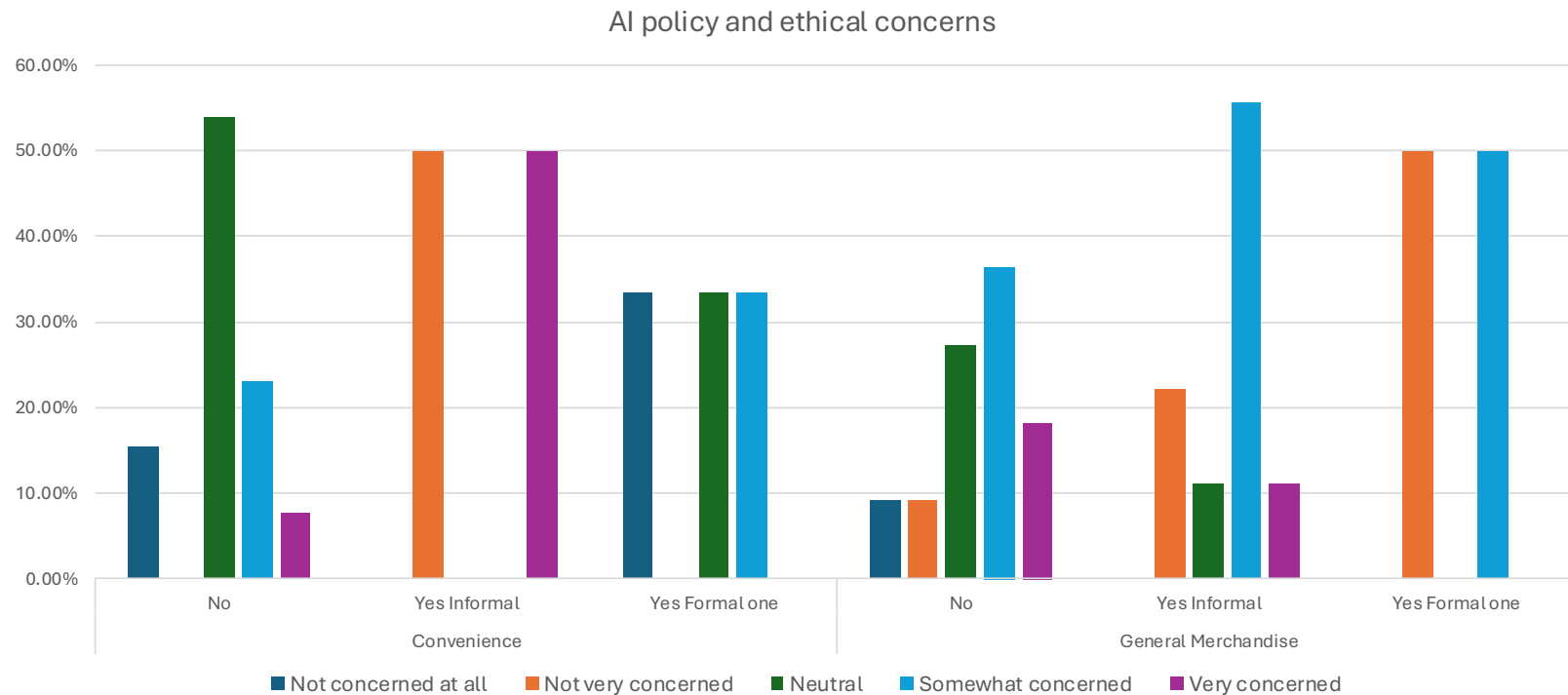


Ethical concerns and regulations

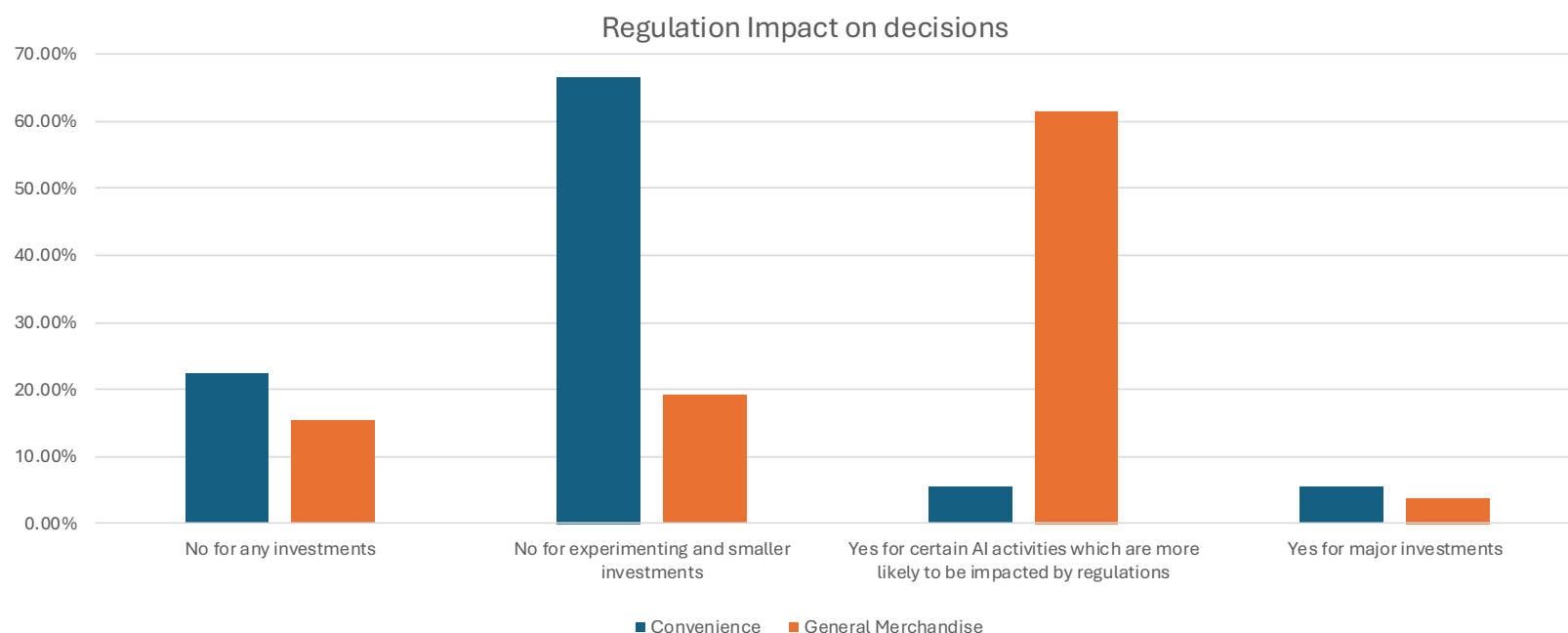
Those who are more concerned about ethical implications tend to favor more regulation



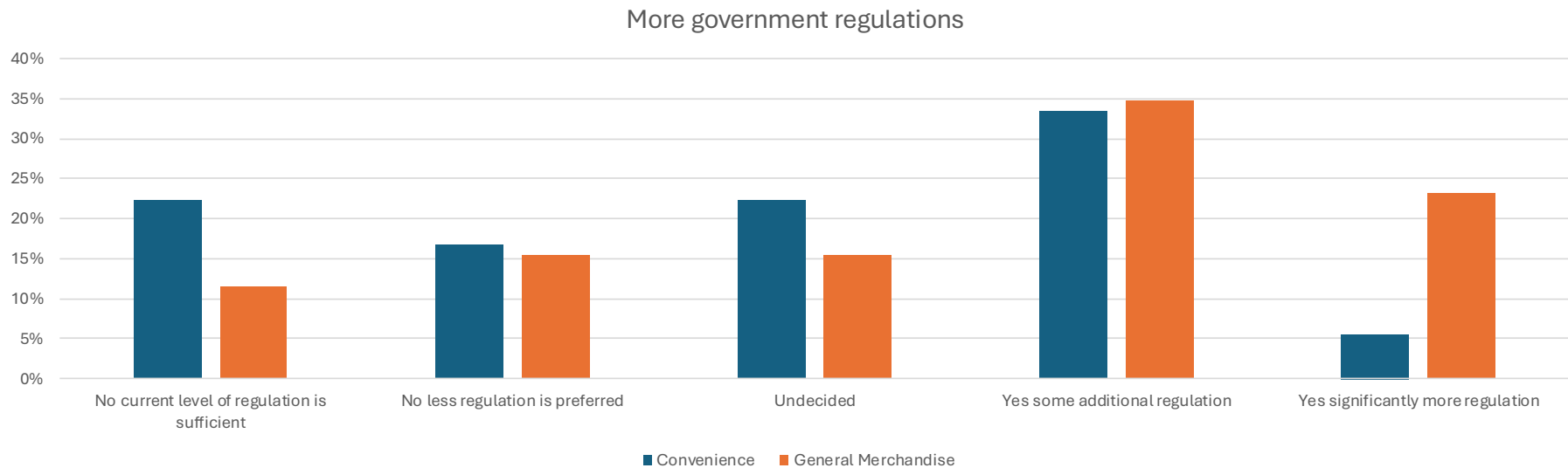
AI policy vs concerns – As concerns increase the retailers are slightly more likely to have some type of policy.



Role of Regulations in decisions is considered for larger investments or where there is concern that there may be regulations in that area in the future.



More government regulations is slightly more preferred for general merchandise

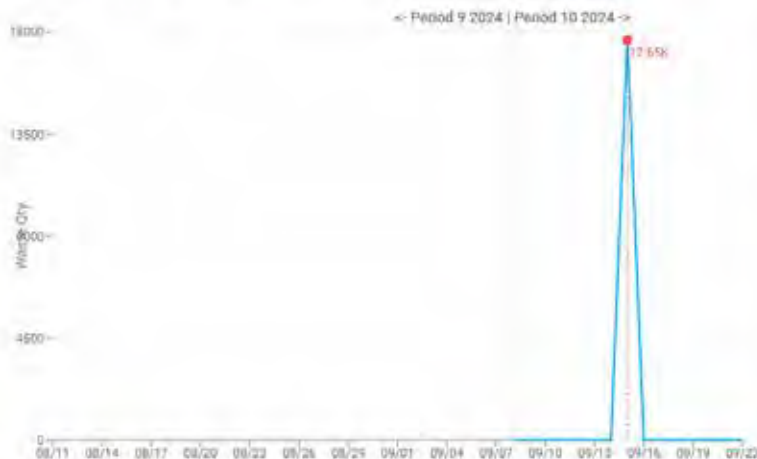


Stories

Sep 23 • 3 mins read

17656 Waste Reported for Empanada Chicken Chili Verde at Store 153

During the Current Period for store 153, the Empanada Chicken Chili Verde, containing 180 calories, experienced a notably high waste quantity of 17,656.0 reported on September 15, 2024.



Inventory Waste Quantities

Sep 21 • 3 mins read

Store #54 Sees Dramatic Gallon Sales Drop – Discover What Happened!

Store #54 has average gallons sold of 2607.62 over the past 8 weeks, current gallons sold has decreased by -85.7038044.

Sep 23 • 3 mins read

Store #154 Sees Major Dip in Gallons Sold: A Shift of 2453!

Store #154 has average gallons sold of 2607.62 over the past 8 weeks, current gallons sold has decreased by -94.0882874 %.

Sales Variance Analysis

Sep 22 • 5 mins read

Empanada Chicken Chili Verde Net Margin Drops \$370093.87 in Store #116

For Empanada Chicken Chili Verde 180cal in Store #116 had we expected Net Margin(\$ of \$33.46 based on past 12 weeks average, however, in the current week it made a Net Margin(\$ of \$-370.060, which is \$-370.094(-1106078.5%) down than expected.

Margin Analysis

Sep 22 • 3 mins read

Store #156 Faces Dramatic Drop in Gallons Sold: A Shift of 1484!

Store #156 has average gallons sold of 3797.29 over the past 8 weeks, current gallons sold has decreased by -39.1032288 %.

Sales Variance Analysis

Sep 22 • 4 mins read

Empanada Chicken Chili Verde Waste Report: 17656 Units, Store 153

During the Current Period for store 153, a notable waste quantity of 17,656.0 for the Empanada Chicken Chili Verde, which contains 180 calories, was recorded on September 15, 2024.

Inventory Waste Quantities

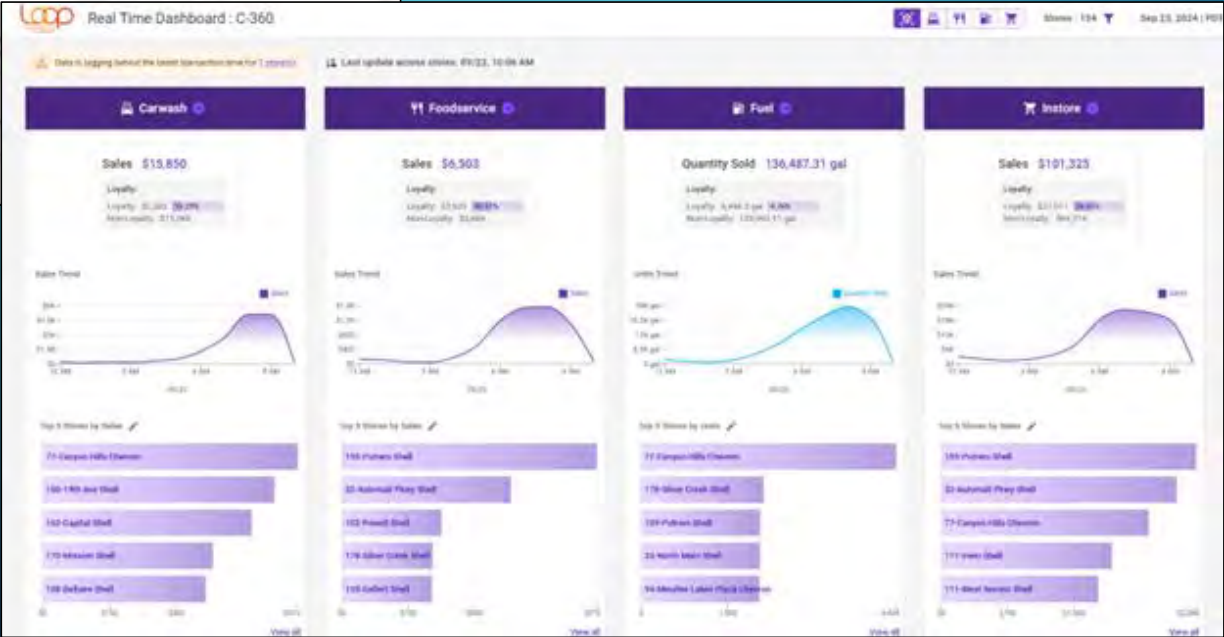
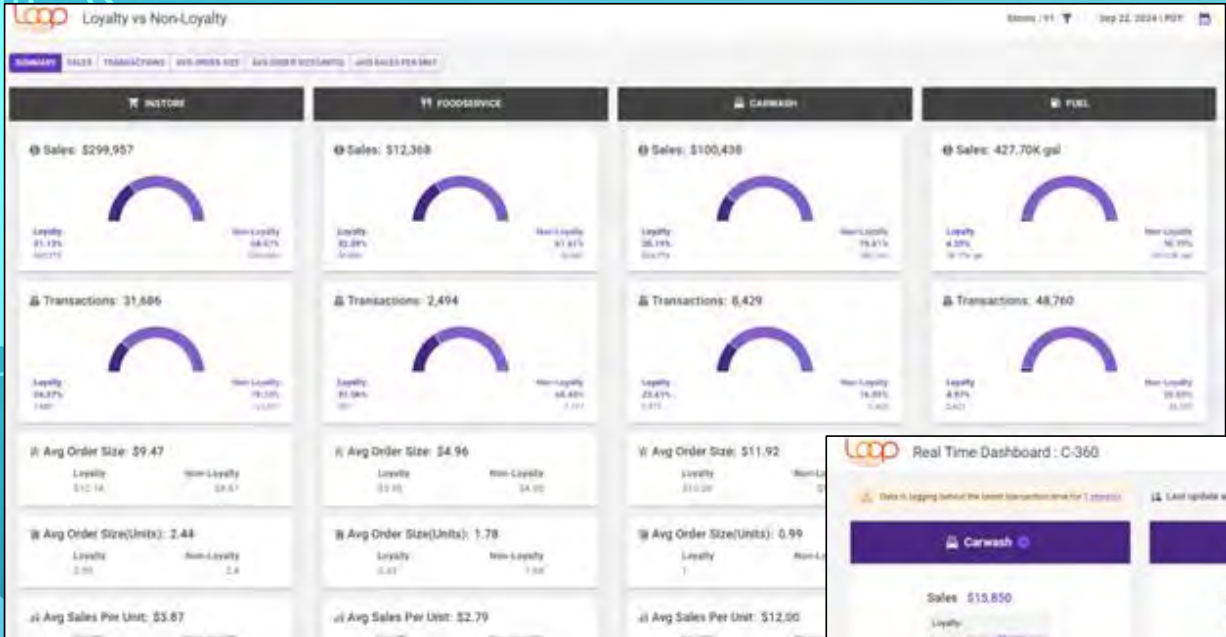


Shared with permission by Sanjit Bajimaya, Loop

CTVG Views

In The Room with CTVG

Presentations



Shared with permission by Sanjit Bajimaya, Loop

BACK TO DISCUSSION

- CTVG Views
- In The Room with CTVG
- Presentations



Johnson
Cornell
SC Johnson College of Business

AI in Retail Research Report

By

Randy L. Allen

Senior Lecturer



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Disclaimer: The views in this presentation are strictly the author's interpretation and not those of the Johnson Graduate School of Management or Cornell University

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CTVG Views

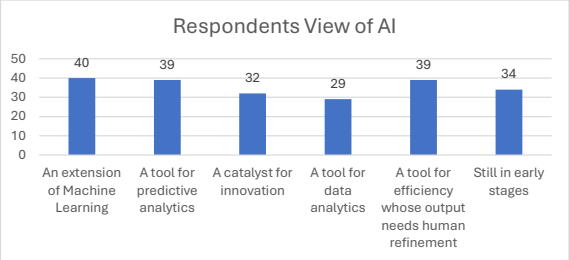
In The Room with CTVG

Presentations

Executive Summary

Based on this survey AI is still in the initial stages of adoption and usage in Retail. This is not surprising given the normal trajectory of adoption of innovative technologies. The indications that this is the current state include the following findings. One executive stated “AI adoption in the retail sector is still very much in its infancy. General education and real-world use cases (which are still limited) are critical to garnering retail executive alignment, securing financial resources and hiring required talent.”

There is no agreement on a clear definition of what AI is at this time as we can see in exhibit 1. Only a little over half of the respondents see it as a catalyst for innovation currently. A similar number



believe it is still in the early stages. Others see it as an extension of uses they have already employed such as machine learning.

Exhibit 1

Companies have implemented AI but primarily in experimental or pilot stages today. Sixty-four percent of the companies are in that experimental or pilot stage.

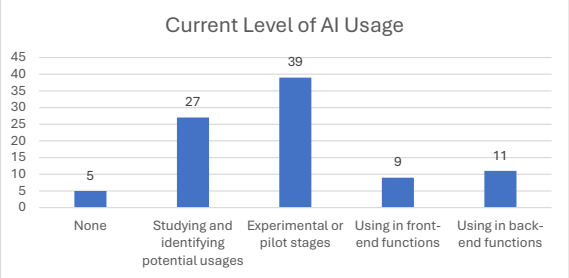


Exhibit 2

The three largest areas of implementation of AI today in retail are in eCommerce, Customer Service and Administration and Human Resources. These are areas where companies have used machine learning and data analytics making an easier transition to AI as seen in exhibit 3.

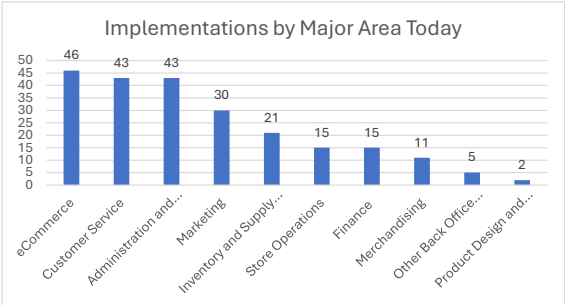
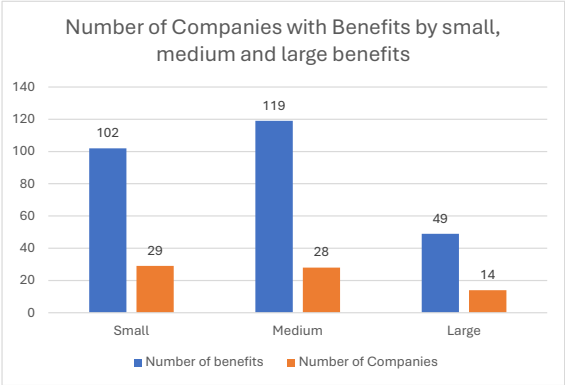


Exhibit 3

These implementations have yielded benefits to the companies with most being in the small and medium range.



Benefits and expectations of benefits vary by area of implementation and the implementation effectiveness. The single largest benefit crossing multiple areas of the business is employee efficiency.

Exhibit 4

There are significant challenges to adopting AI today including the top three of readiness of the AI solutions, cost of implementation, and lack of knowledge and skills.

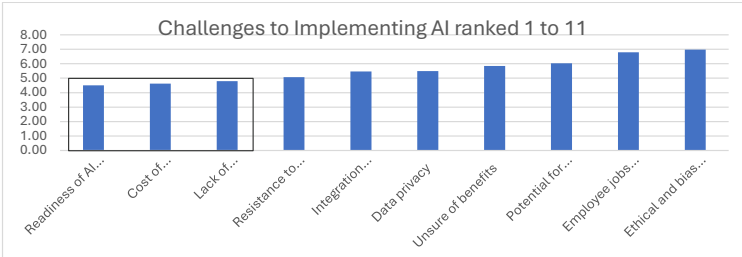


Exhibit 5

Recommendations

- There are recommendations to consider in moving forward with AI in Retail. The key recommendations are:
- 1. Continued experimentation and implementation
 - 2. Sharing of information across multiple types of retailers because the focus of their implementations is varied. This sharing could improve the AI tools available and ideas on how to maximize benefits.
 - 3. Some additional regulations covering intellectual property, copyright, and privacy.
 - 4. AI policies internally covering AI usage to protect intellectual property and privacy.
 - 5. Licensing the tools for internal use only in the company to protect intellectual property.
 - 6. Focus on using internal data combined with the external data used to train the tools initially.
 - 7. This approach should enhance the effectiveness of the tools.

Detailed Report

The detailed report follows in the rest of the report. It covers all aspects of the survey in detail.

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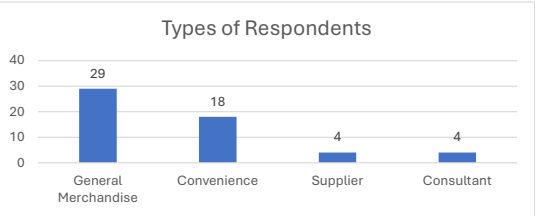
Special Thank You33

1. Background

This research report covers a survey on AI in Retail run in April-July 2024. The survey was developed through the following major steps.

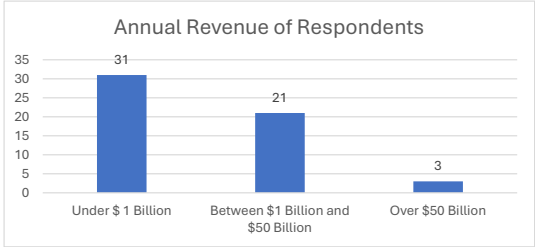
- Secondary research on AI in Retail in the fall of 2023
- Interviews of a small group of retail executives in January and February of 2024
- Test survey develop and fielded in March of 2024
- Revisions to the survey based on feedback and a request for more in-depth information.
- The survey to members of The National Association of Convenience Stores, the Retail AI Council and names developed from a variety of sources who are knowledgeable about AI in Retail
- I analyzed the results in August and September 2024, with assistance from two Johnson graduates and a high school senior, leading to this report.

There are a total of 61 responses. The respondents were divided into type and revenue. Six companies did not identify the type of retailer they were, preferring anonymity. The retailers were divided into two groups Convenience and General Merchandise.



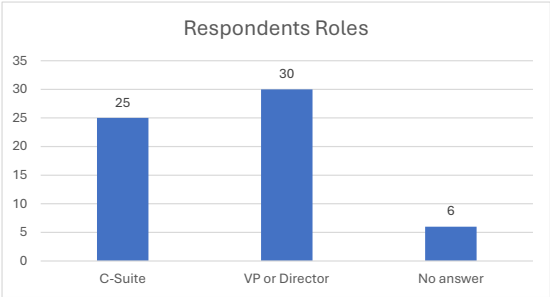
- 1. Convenience stores
- 2. General merchandise includes apparel and footwear, electronics, beauty, rugs, eCommerce, etc.

Exhibit 5



There was a wide range of annual revenue among the respondents as can be seen in exhibit to the left.

Exhibit 6



The respondents were from multiple roles in the C-suite including one board member as well as VPs and Directors involved with AI within the company

Exhibit 7

2. AI Background

The respondents ranged from slightly knowledgeable to extremely knowledgeable with over half rating themselves moderately knowledgeable as seen in the chart below.

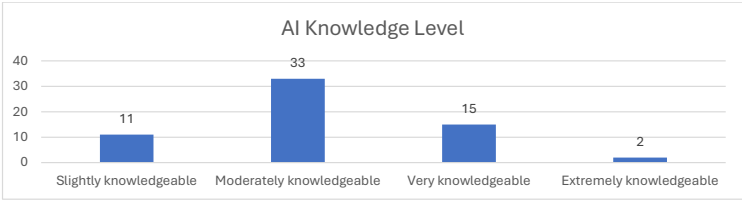


Exhibit 8

Retailers learn about AI through five methods with most respondents using more than one approach. Other approaches mentioned in the survey include Retail AI Council and building and using LLMs.

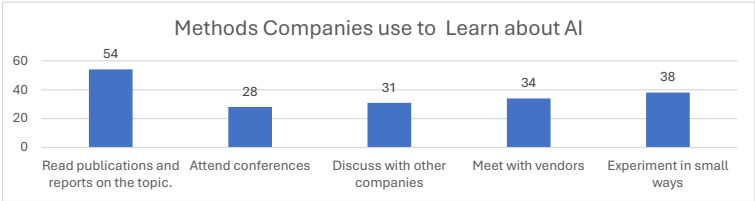


Exhibit 9

Despite the level of knowledge and methods used to learn about it, there is not a clear view of what AI is. This is a result of the level of maturity of AI today.

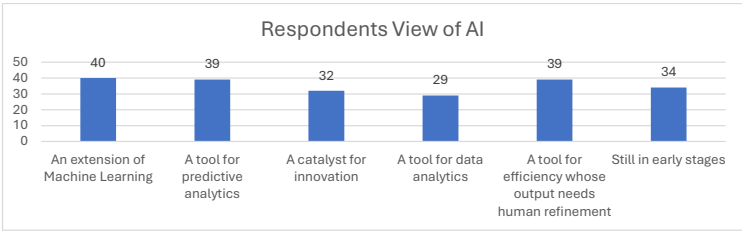


Exhibit 10

3. Current Usage and Plans

This section explores the current usage of AI, and plans. Only five of the respondents said they were doing nothing with AI today. Twenty-six are studying it and identifying areas where they could use it the business, some companies are also using it in the company today. Sixty-six percent of the companies are engaged in experimentation and piloting. Some of the companies are also using AI in both front-end and back-end functions as we will see in more detail in this report.

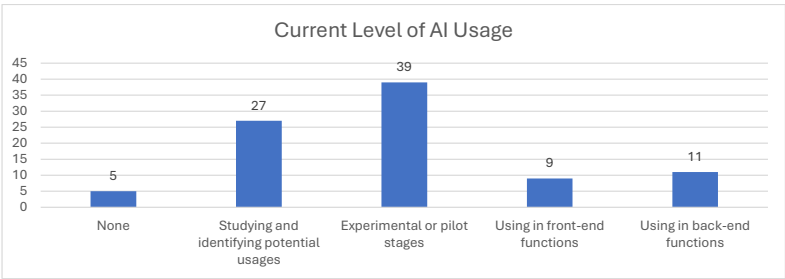


Exhibit 11

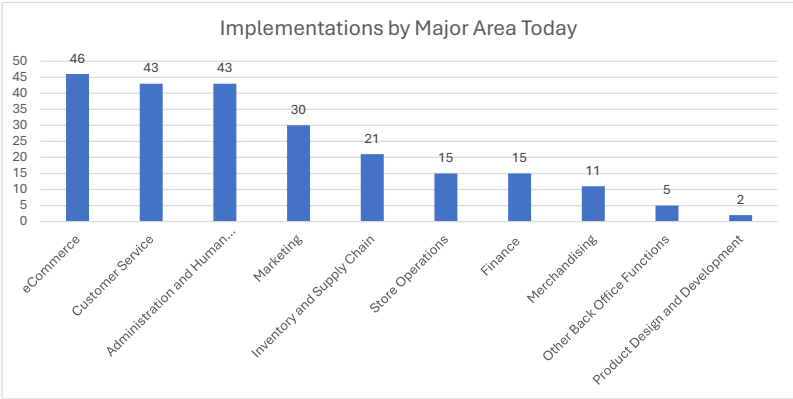


Exhibit 12

The implementations today cover all aspects of the retail business, dominated by eCommerce, customer service and Administration and HR.

The implementations shown in exhibit 8 have yielded a wide range of benefits. There are five areas which have the greatest benefits as seen in Exhibit 13 below. Employee efficiency is by far the largest benefit. This employee efficiency can drive secondary benefits not measured as employees have more time to think analytically and creatively about strategy and improving the business. One respondent said “With Retail being a fast-paced industry, and the difficulty in attracting and sustaining talent to the sector, AI will be a successful tool to attract and promote new talent. ...it will need to be more strategic to balance where the efficiency gains in the workforce can be applied to free up resources for other activities, as well as where to adopt to improve customer satisfaction. The adoption of these will then translate into higher revenue and profits.”

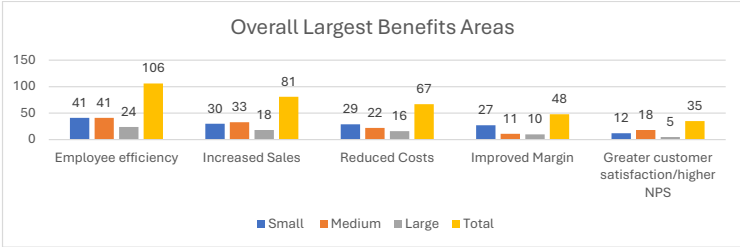


Exhibit 13

The number of implementations has an impact on benefits by level of benefit and in total as seen in the exhibit below. There is not a strong correlation between them, however they do increase with the number of implementations. More effective implementations, better use cases, and availability of knowledgeable is contributing to it.

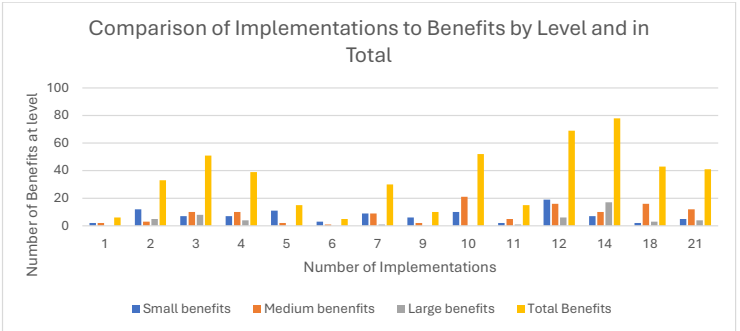


Exhibit 14

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The areas retailers plan to leverage AI over the next three years paints a different picture. Marketing and Data Analysis and Visualization increase in importance to the top two areas for future expansion. This shift may be the result of the increased experience with AI and new and enhanced tools focusing on these areas. It may also be a result of more experience with AI and learning about the experiences of other retailers in these areas. Other comments included customer insights and behavior analysis, sales, along with some who are not willing to share or are not sure.

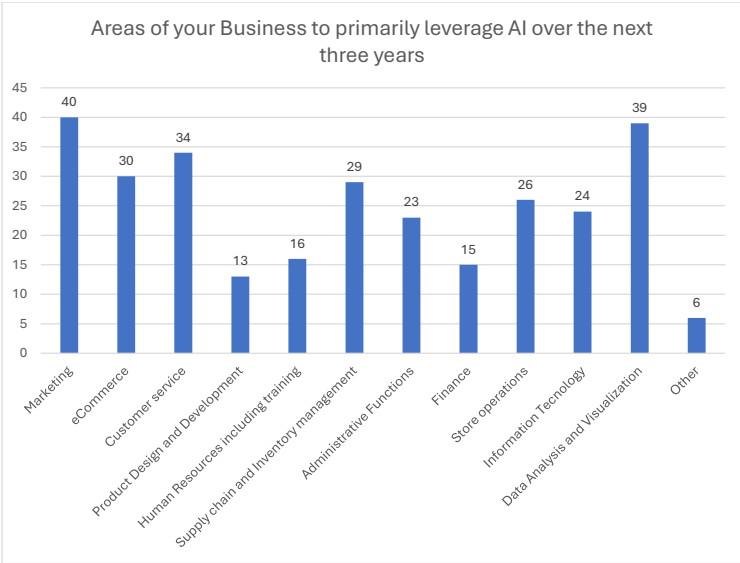


Exhibit 15

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4. Current and Planned Implementation and Benefits

This section looks in-depth at the different company areas exploring current implementations, plans, and the benefits being achieved today. Benefits are divided into different areas with a level of small, medium, large, or too early to tell of none. The areas included in this section are:

- eCommerce
- Customer Service
- Administration and Human Resources
- Marketing
- Inventory and Supply Chain Management
- Store Operations
- Finance
- Merchandising
- Other Back Office Functions
- Product Design and Development

Some of the above areas have more companies using AI than in others, the number of companies in each area is still a small number supporting the need for improved solutions, reduced cost of implementation relative to benefits and the availability of knowledge and skilled resources. Given that AI is still in its infancy it is not surprising, like most innovative technologies. “Usage of Machine learning and LLM in Marketing, Commerce, Forecasting, Fraud management has already become mainstream.” Continued experimentation and pilot programs will help development. In addition, associations, and groups such as the Retail AI Council, NACS, and CTVG provide opportunities for information sharing and education.

eCommerce

This area has the most implementations today; however, the numbers are small with twelve companies being the most in any area. All areas having some level of current implementation with product recommendations and enhanced search and product descriptions leading in both usage and plans. Direct marketing messaging will be the focus of efforts in the next 12 months according to current plans.

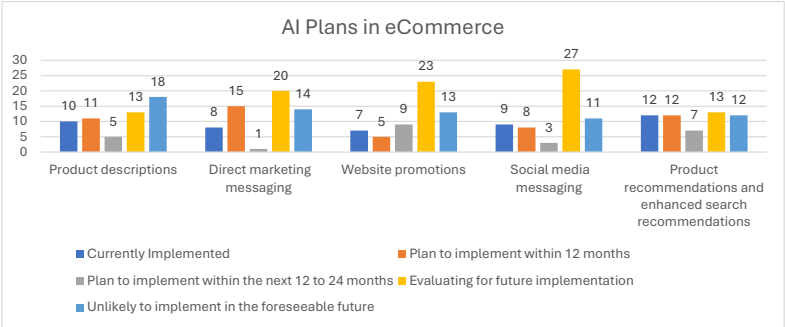


Exhibit 16

Companies are achieving benefits across multiple areas and with small, medium, and large benefits. The largest benefits are in employee efficiency and increased sales.

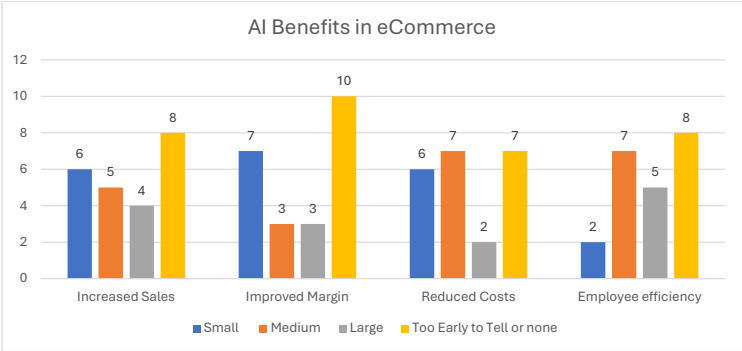


Exhibit 17

Customer Service

Customer Service, as eCommerce has one of the higher levels of AI implementations and plans. Product recommendations, recommendations for add-on products and chatbots have the highest current usage and plans for the next twelve months. The areas are abbreviated in the graph. They are in order:

- 1. Product recommendations online
- 2. Recommendations for add-on products online
- 3. Product suggestions in store to customers via store personnel.
- 4. Product suggestions direct to the customer in the store
- 5. Chat bots online for questions such as order status, product questions, etc.
- 6. Enhance RFM results.
- 7. User Experience design and optimization in eCommerce.

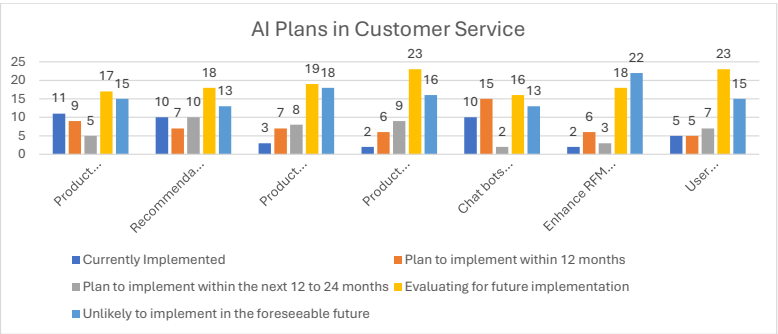


Exhibit 18

The largest benefits are in reduced costs and employee efficiency.

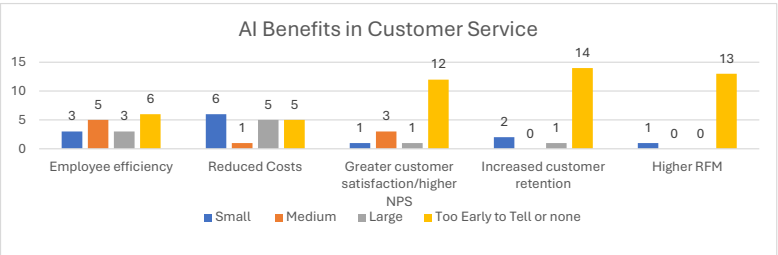


Exhibit 19

Administration and Human Resources

This area has the third largest number of companies using AI today. Given that machine learning and AI have been in use in this area for a while. This factor means there is more experience to draw on and more tools available as well. The most popular areas are meeting minutes, writing job descriptions and screening resumes.

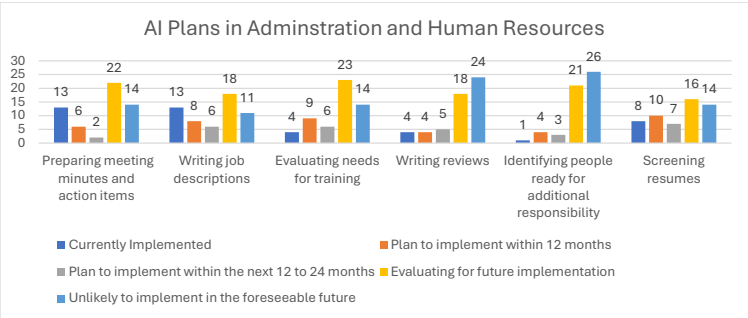


Exhibit 20

As exhibit 15 shows, the greatest benefit here is employee efficiency, which is not surprising given the current usage areas.

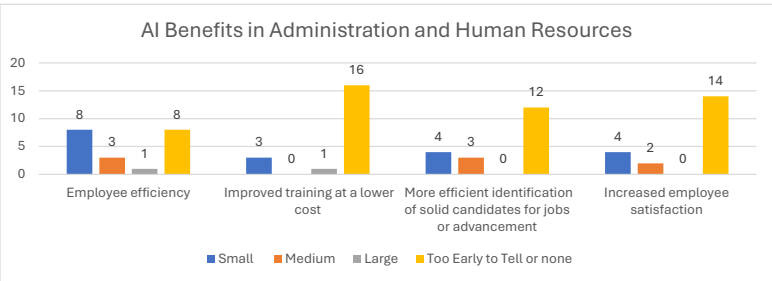


Exhibit 21

Marketing

This is the fourth largest area with AI usage. It fits with the focus on eCommerce and Customer Service areas. The areas are almost equal across the board. Other includes customer responses and feedback and demonstrating it can lift sales and reduce costs.

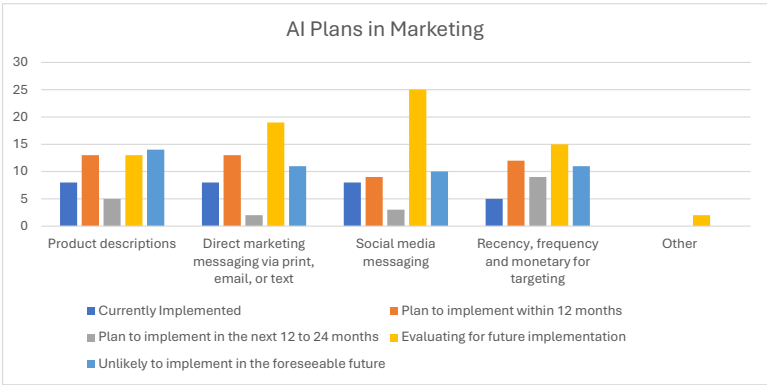


Exhibit 22

It is a small sample of companies but there are benefits in all areas and all three benefit size ranges.

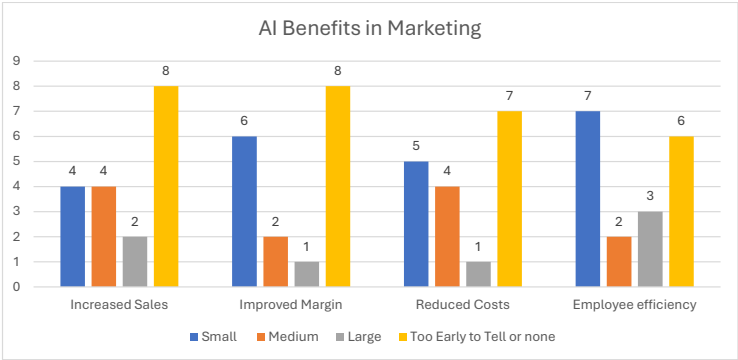


Exhibit 23

Inventory and Supply Chain

Given the level of historical automation in inventory and supply chain management is realistic to be an area of focus for AI. Historically there have been analytical, predictive analytics and machine learning in this area, which has contributed to the usage of AI.

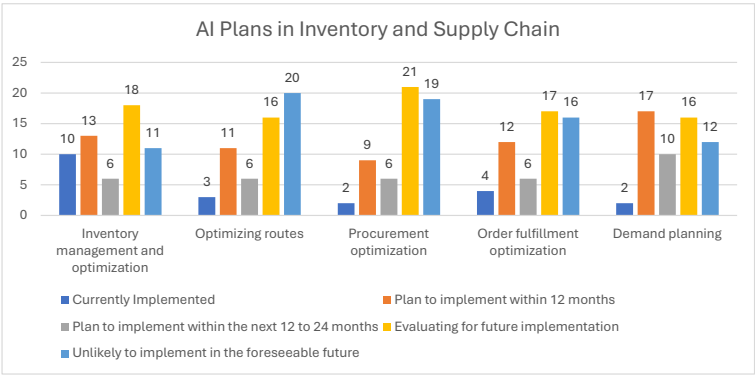


Exhibit 24

The largest area of benefits has been in reductions in inventory and better turns. Benefits are in all areas to some level.

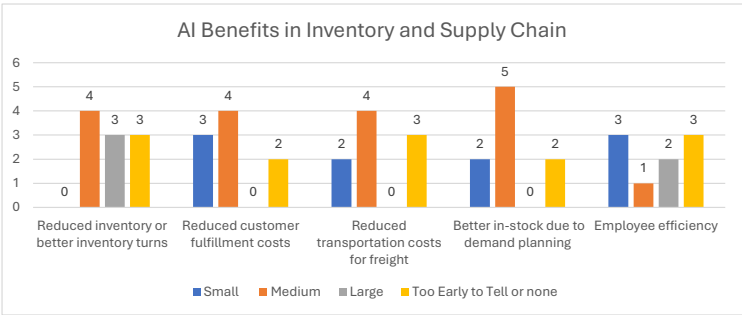


Exhibit 25

Store Operations

There are only a few implementations currently in store operations. The convenience stores have done more in store operations. Their thin margins and difficulty in hiring has contributed to their focus in this area.

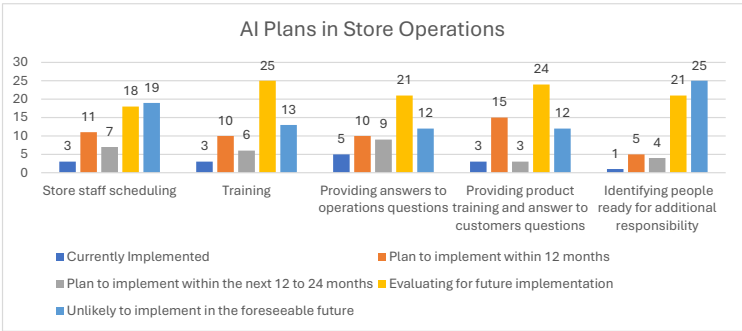


Exhibit 26

The benefits in store operations are small both in terms of number of companies and size of benefits. This may stem from prior investment in store scheduling systems and a desire to have managers training staff. However, the ability of store people to have additional training at a lower cost could be a plus.

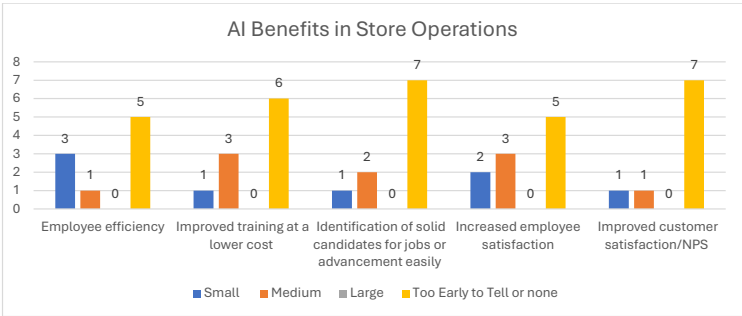


Exhibit 27

Finance

Finance is an area where systems and data analytics have extensive use resulting in less focus on AI in this area currently and fewer short-term plans.

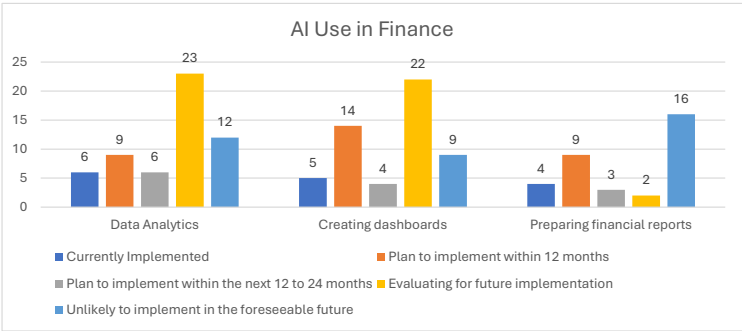


Exhibit 28

The companies who have implemented AI are obtaining small and medium benefits with one company with large benefits.

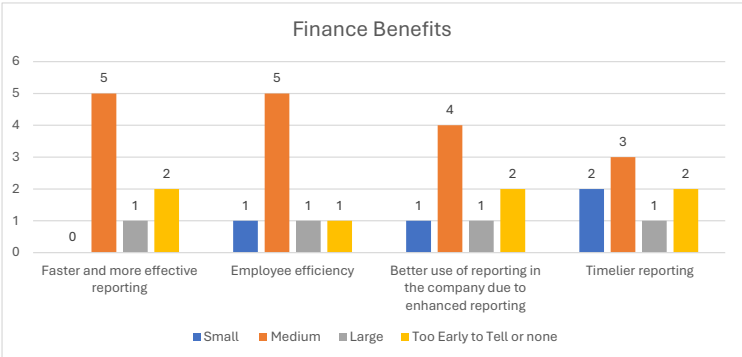


Exhibit 29

Merchandising

Merchandising is an area where very few companies have implemented AI. These applications would tend to be more complicated and reliant on the company's data for training the AI tool. Therefore, the companies have prioritized other areas where they can implement more efficiently and are more likely to achieve benefits sooner with better tools available.

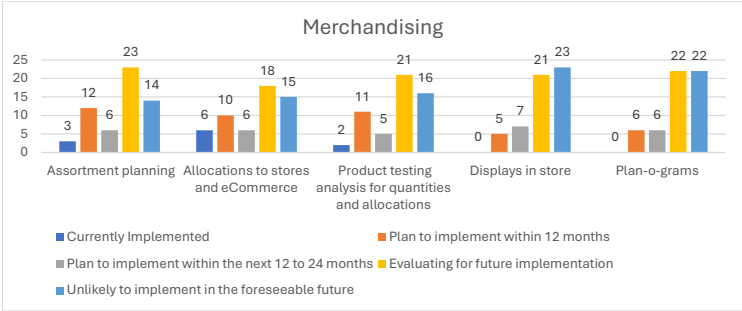


Exhibit 30

Given the small amount of AI usage today there are only one or two companies with benefits reported. More companies state it is too early to tell or none. However, the is one company obtaining large benefits in increased sales employee efficiency and increased customer satisfaction. As AI usage expands it seems likely that there will be medium and large benefits gained.

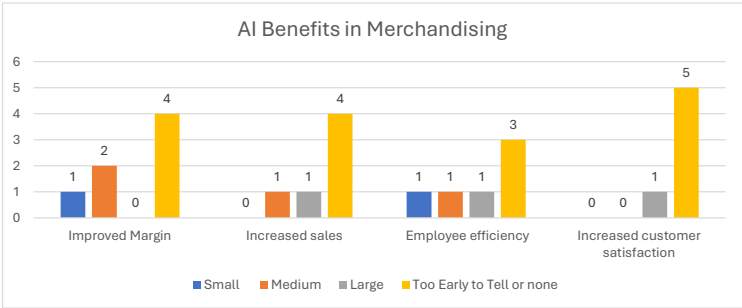


Exhibit 31

Back-office Functions

There is limited use in back-office functions today. Given the level of loss prevention issues today, it is not surprising to see that area with the most current usage. Data analysis and visualization has been in use so there is not the same level of need as in the other areas where there are investments. One of the respondents is planning to use a Veesion Camera.

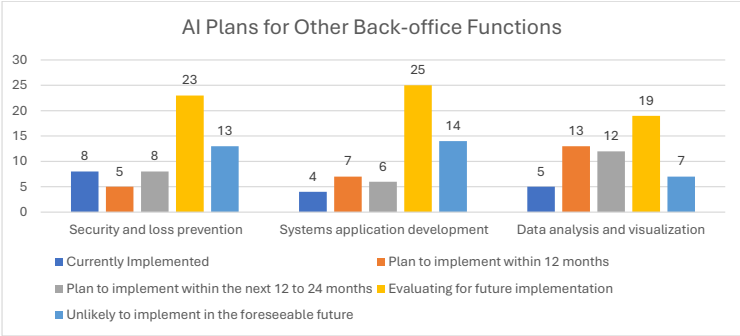


Exhibit 32

Most benefits in other back-office functions are medium in size with a couple of large benefits.

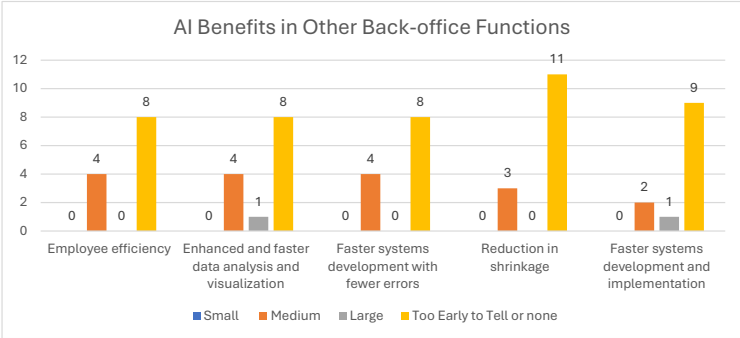


Exhibit 33

Product Design and Development

There are only two responses with current implementations in Initial product design ideas and design refinement. One executive expressed a real concern about copyright infringement in this area if the AI is learning from the information available on the internet given the number of pictures of products available. It may take time for this area to see greater usage of AI.

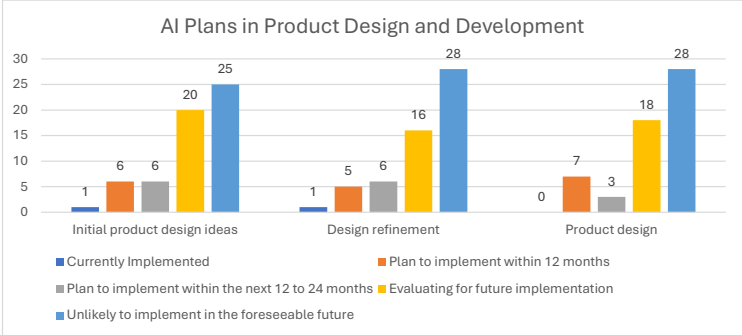


Exhibit 34

Despite the limited usage companies have seen benefits in employee efficiency and more creative designs. The efficiency may be due more to design refinement than initial product designs. The creativity may be a result of design ideas that vary from the current products, resulting in more innovative ideas.

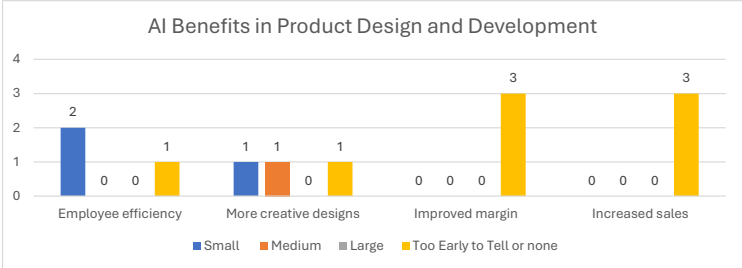
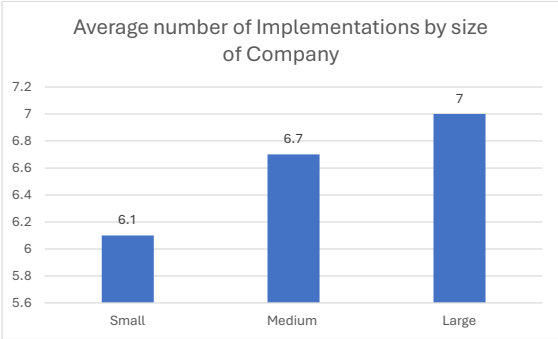


Exhibit 35

5. Implementation Experience

There are a variety of ways that retailers have implemented AI, and with some utilizing more than one way. Vendor development and implementation alone is the least effective, which could be related to the number of times the tool has been used or the retailer’s understanding of it. Vendor only development and implementation need to improve to have AI more easily accessible to smaller companies. There were some comments about whether there were good AI solutions today. “There’s a lot of solutions out there in search of a problem.” “Over confidence in black box achieved solutions.” “AI is overused as sales pitch” “AI solutions need to be more reliable.”

The number of average implementations varies by less than one across all three company sizes.



Small size companies had a total of 115 implementations in 18 companies

Medium size companies had a total of 100 implementations in 15 companies

Large size companies had a total of 14 implementations in 2 companies

Exhibit 30

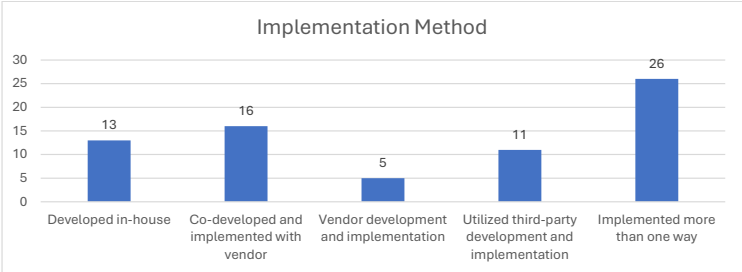


Exhibit 31

Overall vendor development and implementation alone is not as effective as other methods such as In-house, co-development with a vendor, and multiple methods which were the most effective methods. The vendor will improve, and smaller retailers need to help with them in making improvements to meet their needs. Working together as a non-competitive group of small companies can help the vendor accelerate the improvements to their tools.

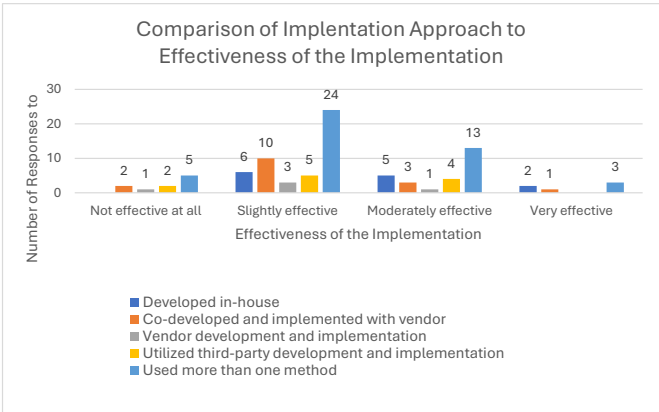


Exhibit 32

Overall, the effectiveness of the implementations is mostly slightly effective to very effective with slightly and moderately the most common.

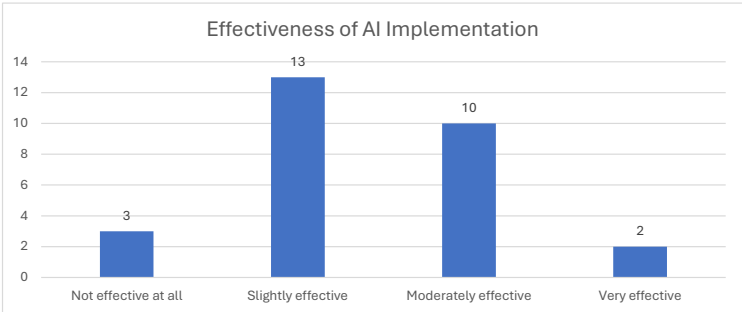


Exhibit 33

There were a wide variety of training approaches used. I compared the relationship between the method for training and the effectiveness of the implementation. There was not a relationship. The numbers are also small

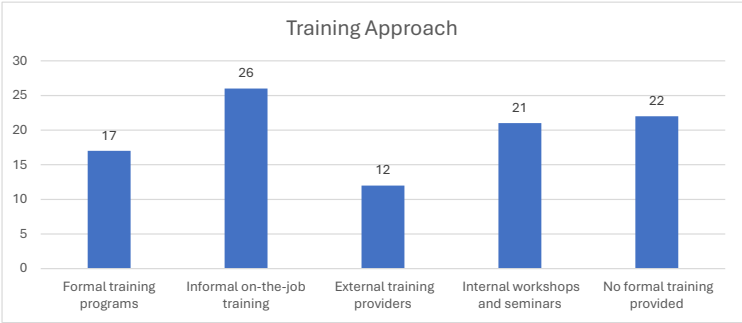


Exhibit 34

When asked what problems occurred during implementation, respondents divided the problems into expected, unexpected or did not occur. The only unexpected problems were software, or tools did not perform as advertised by five respondents and five for Identifying suitable use cases. It was surprising that a lack of executive buy-in occurred and was unexpected in four cases. Five of the expected areas did not occur as often as expected including data quality/availability issues, scalability concerns, compatibility with existing systems, lack of executive buy-in and lack of skilled personnel.

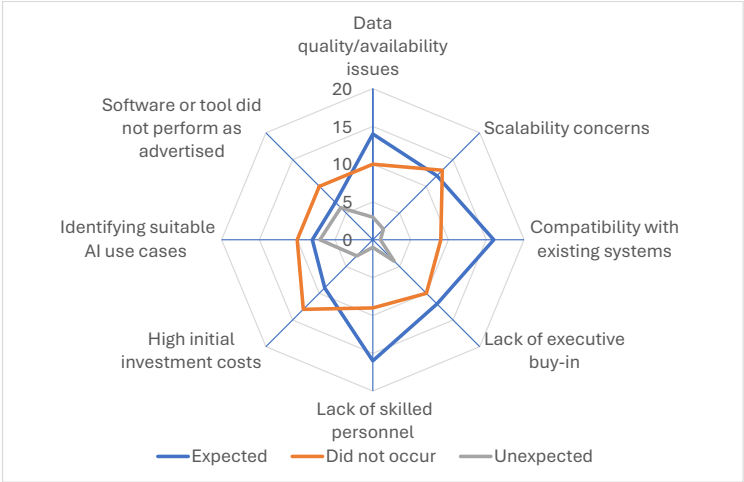


Exhibit 35

There are significant challenges to implementing AI. Retailers ranked them one to eleven with number one being the most challenging and down. The top three will improve over time as AI matures like other technologies. Recognizing these challenges will help the industry to prepare for them and reduce the level of challenge. Other comments on challenges included finding the right AI solution and contribution to the business.

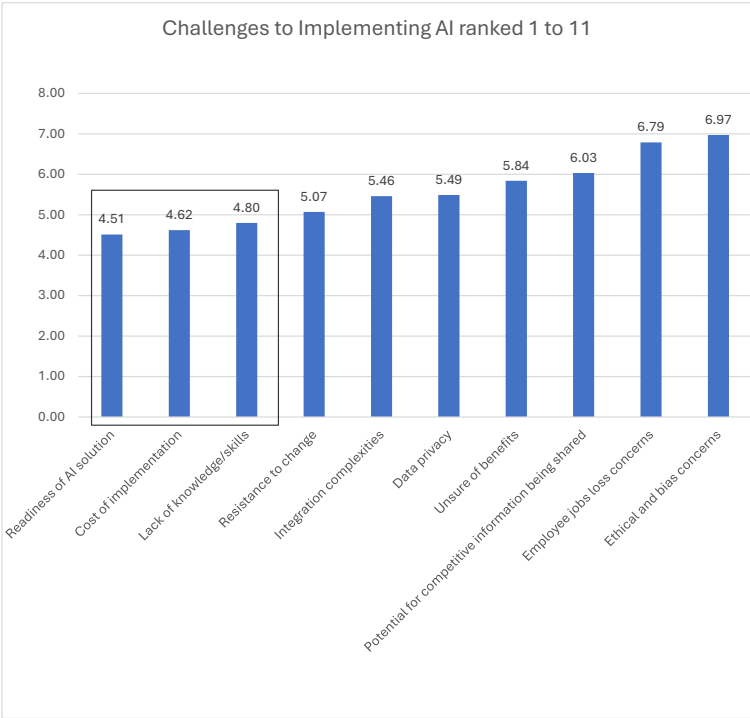


Exhibit 37

6. Ethical Concerns, Regulations and Policies

Respondents are concerned about the ethical implications of AI with thirty companies very or somewhat concerned, only fifteen are not concerned or not very concerned.

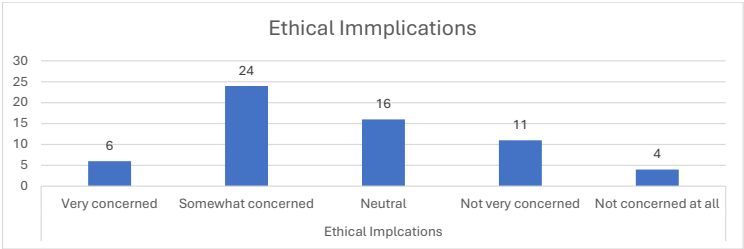


Exhibit 38

However, there is not a consistent view between ethical concerns and having an AI Policy. It may be that due to the limited usage today, respondents do not feel as concerned about having a policy. That may change as usage increases and any challenges to copyright infringement and privacy are resolved.

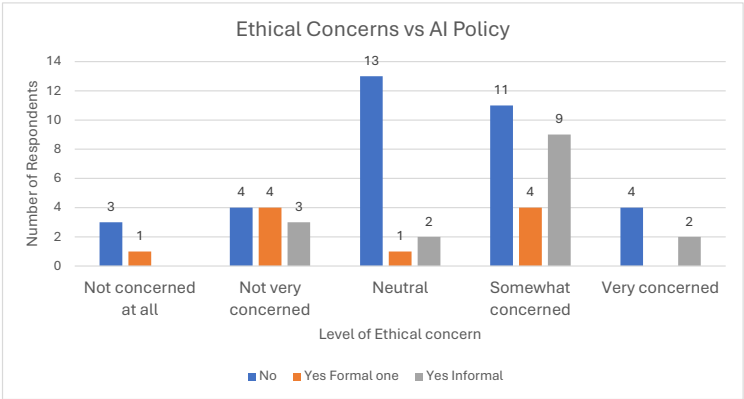


Exhibit 39

Companies consider regulations as a factor in certain cases when deciding on an AI implementation. The two areas where there are concerns about regulations are in making a major investment in AI or activities which are more likely to have regulations developed such as privacy and copyright. There are also concerns about areas where the government might promulgate regulations. Overall, few companies prefer more regulations. However, there are concerns about AI prompting respondents to believe there is some need for more regulation. See the comments below.

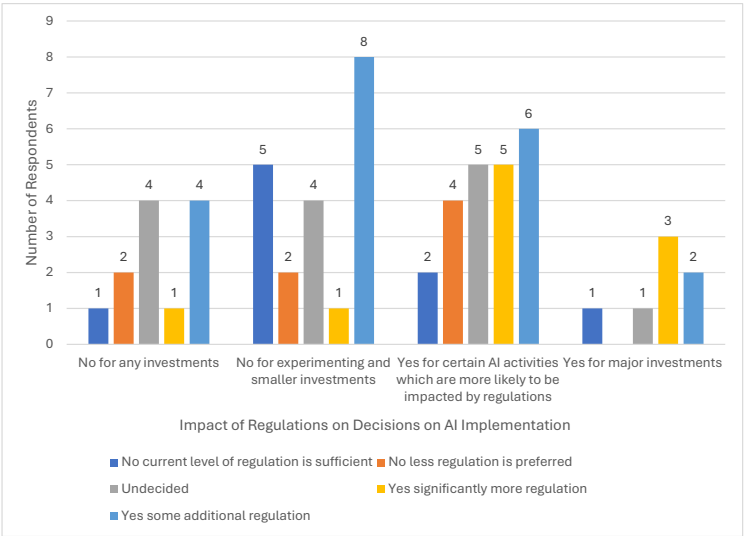


Exhibit 38

There were comments from respondents regarding regulations that are important to consider. “It is hard to be onboard for government regulation overall because most regulations are burdensome and costly to small business but the immense power of AI as it grows is scary and needs some guardrails” “Government should be responsible for AI Super Alignment and control to ensure AI and AGI operate in ways that are beneficial to humanity and avoid negative use and causing harm.” “Governance in controlling AI and its overreaching capabilities” “More regulations need to be put into place to protect personal data. False positive/hallucinations are still a concern.” “Customer Privacy protection does not exist.” “There needs to be regulation around usage of training data.”

7. Views on the Role of AI in Retail

Retailers view AI as essential for remaining competitive. If other competitors move quickly, they will have a competitive advantage.

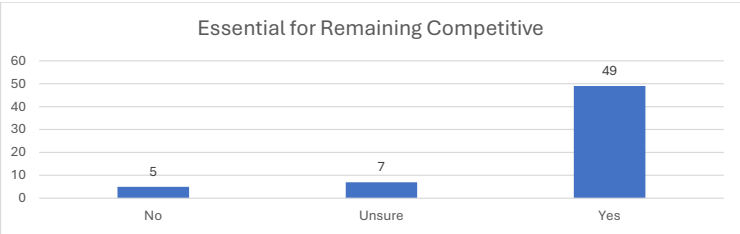


Exhibit 39

Half of the survey respondents believe AI is essential for growth and innovation. About twenty percent believe it is a useful tool but not transformative. The remainder are unsure or believe it is too early to say.

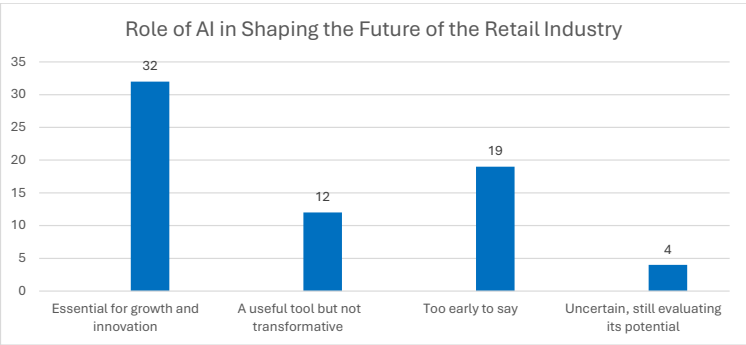


Exhibit 40

Respondents had some interesting insights and comments about both the current and future state of AI. The comments center around needing more information, better solutions, and genuine business cases in the use of AI. This section includes many of the comments, others have been included within sections where they are relevant.

- “I would love to see more of informative AI solutions to our complex retail business, pricing, invoicing and inventory management, lack of understanding of our retail business to implement AI and see what is beneficial and really needed.”
- “It is hard to know what AI system to use and how to implement in our daily operation, there is no specific AI system available or talked about and the retail community is not showing anything to encourage or explain what is available.”
- “The answers would be vastly different for machine learning, analytics heuristics, etc., application set, as they are widely implemented (with proven business value) across all functions of the company, today.”
- “It will be a part of the industry, so adopting it now to help pave that road is the best plan.”
- “I think AI is the future and will be implemented in some “shape or form” to most if not all businesses over the next decade. We need to get all industries more educated on how to use AI for different areas of our business, and personal life.”
- “Analytics and quantification of actions and activity using visual inputs from cameras is an expected next stage. Integration of customer data and activity across partner platforms will create fierce competition related to affecting customer behavior, particularly regarding influencing destination points to satisfy needs (I want a sandwich, where should I stop) (added by the report author or where should I go for popular footwear). Outcomes resulting from these changes will significantly change the retail landscape and what companies need to do to compete.”
- “I would love to see more of informative AI solutions to our complex retail business, pricing, invoicing and inventory management, lack of understanding of our retail business to implement AI and see what is beneficial and really needed.”
- “What is available and refer for Dynamic Pricing Strategies with AI: Problem: Pricing decisions are critical but challenging due to market fluctuations, competitor actions, and customer demand. Smart Inventory Management: Problem: Maintaining optimal stock levels while minimizing excess inventory is a delicate balance. Predictive Maintenance: Problem: Unplanned equipment failures disrupt operations and impact profitability. Chatbots for Customer Service: Problem: Handling customer inquiries efficiently and consistently. Automated Invoicing and Billing: Problem: Manual invoicing is time-consuming and error prone.”
- “All solutions need to be more reliable.”
- “I think there are ... places where AI will become commonplace. For example, a fair amount of our website traffic comes through SEO (Search Engine Optimization). We do not have fulsome product descriptions and are limited in the number of product landing pages we can create manually. However, AI is extremely well-suited for both use cases. We will implement this quickly and will achieve a competitive advantage. Then the next step will be that competition catches up to us. Therefore, I think it is necessary to remain competitive in the short term.”
- “There's need to speed up AI usage in regard to preventing shrinkage.”

- “Currently, the key focus is around identifying use cases spanning 2 areas - a) improving internal productivity and b) improving experience for external customers which translates to some business benefits.”
- “I think AI will be used to refine inventory purchases both in quantity and trend by store initial buys will be better by store. Buyer bias will be lessened because of AI. It will also help us stay engaged with our customers by talking with them in the customer’s favorite manner, text, email, social media etc. The amount of cost savings by having the right inventory at the right time in the right store could be the difference in still being in business or not.”

Interestingly about half of the C-suite and VP or Directors agree that it is essential for growth and innovation. The VP or Director level is less positive in the other aspects, likely because of past experiences with innovative technologies.

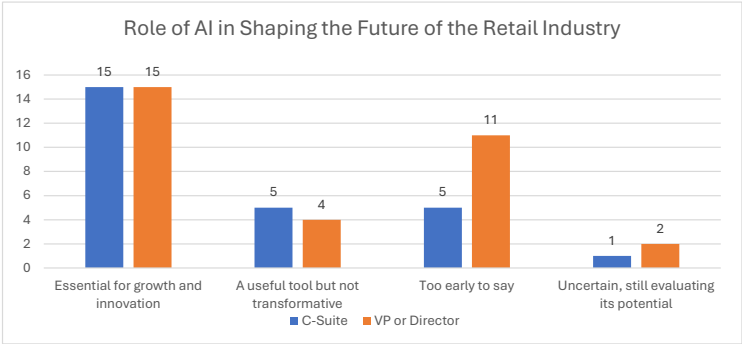


Exhibit 41

8. Closing

AI in retail has potential based on a limited survey. Whether it develops into a robust component of the Retail Industry will depend on continued development and experimentation as has been the case for any prior innovative technology. It will also take training on the retailer’s own data to truly achieve its full potential.

One also must wonder, if AI could create something like “Twenty Thousand Leagues under the Sea” at the time Jules Verne did or Leonardo da Vinci’s idea for a helicopter. AI can learn and be smart, but will it provide the creative insights or questions we all ask every day. Maybe its greatest benefit will be freeing up our time from routine tasks to provide more time for creative thinking and asking difficult questions.

I look forward to watching the evolution of AI and hopefully expanding on this survey with more participants or a new survey to see how it is progressing.

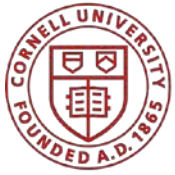
Special Thank You

Special thanks to three individuals who assisted with research, interviews, the survey, and analysis including:

- Gino Andre Arevalo Vega
- Grant Conroy
- Zachary Sayah

In addition, I would like to thank my friends, colleagues, alumni and connections for helping set up interviews, reaching to people to participate in the survey.

In addition thank you to the NACS, the Retail AI Council, and CVTG for their assistance in reaching out to their constituencies to complete the survey.



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AI in Retail Survey Results and Insights

Convenience and General Merchandise Comparison

By Randy L. Allen
Senior Lecturer

Disclaimer: The views in this presentation are strictly the author's interpretation and not those of the Johnson Graduate School of Management or Cornell University



CTVG Views

In The Room with CTVG

Presentations

Current and Planned Implementations and Benefits

What is being done and what is being achieved

Supporting Slides for the Executive Summary

3

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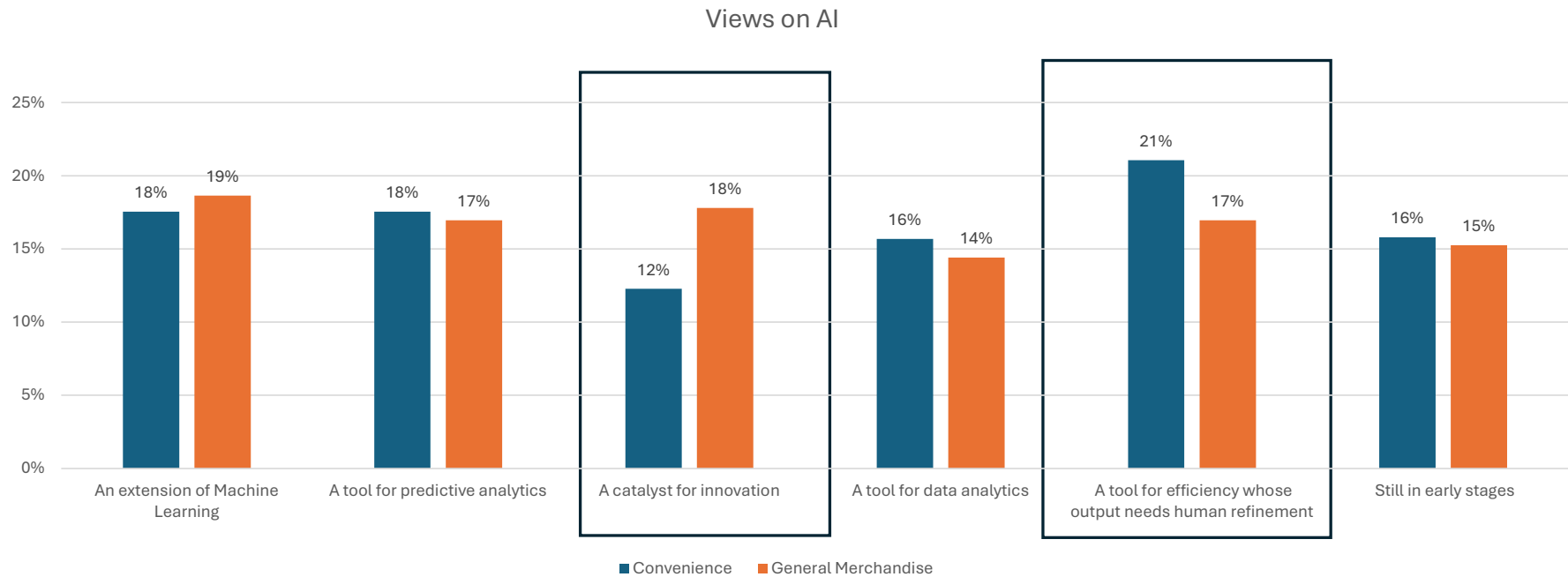
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CTVG Views

In The Room with CTVG

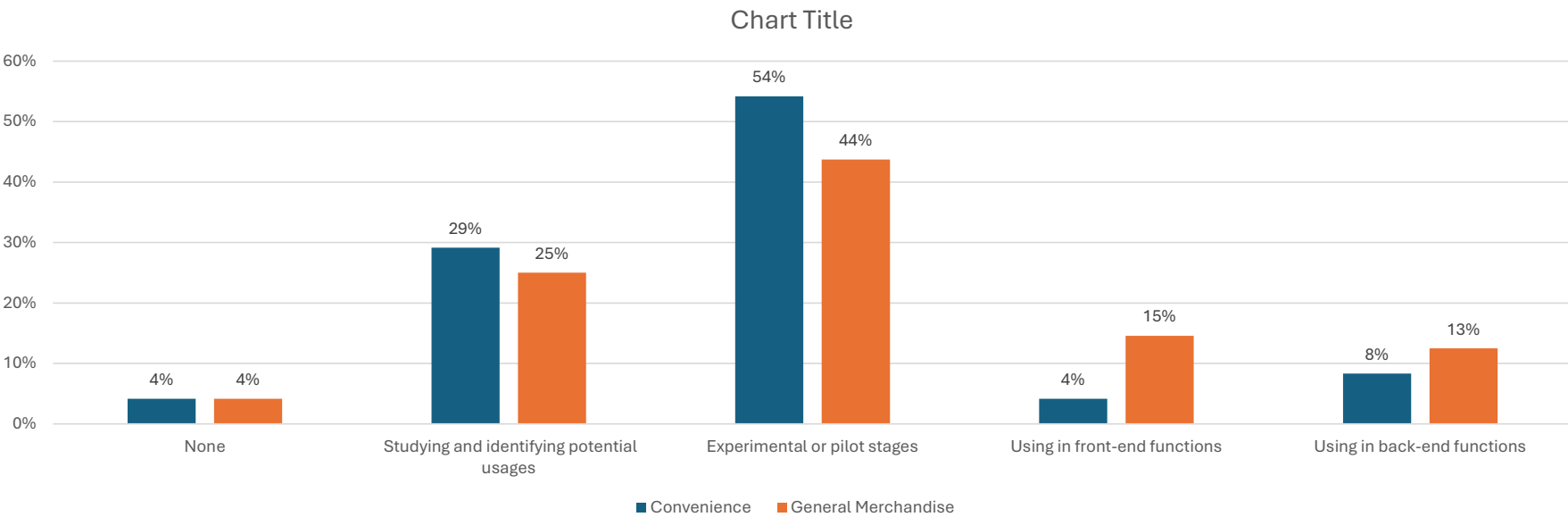
Presentations

Both types of retailers have mostly similar views on the role of AI now and in the future.



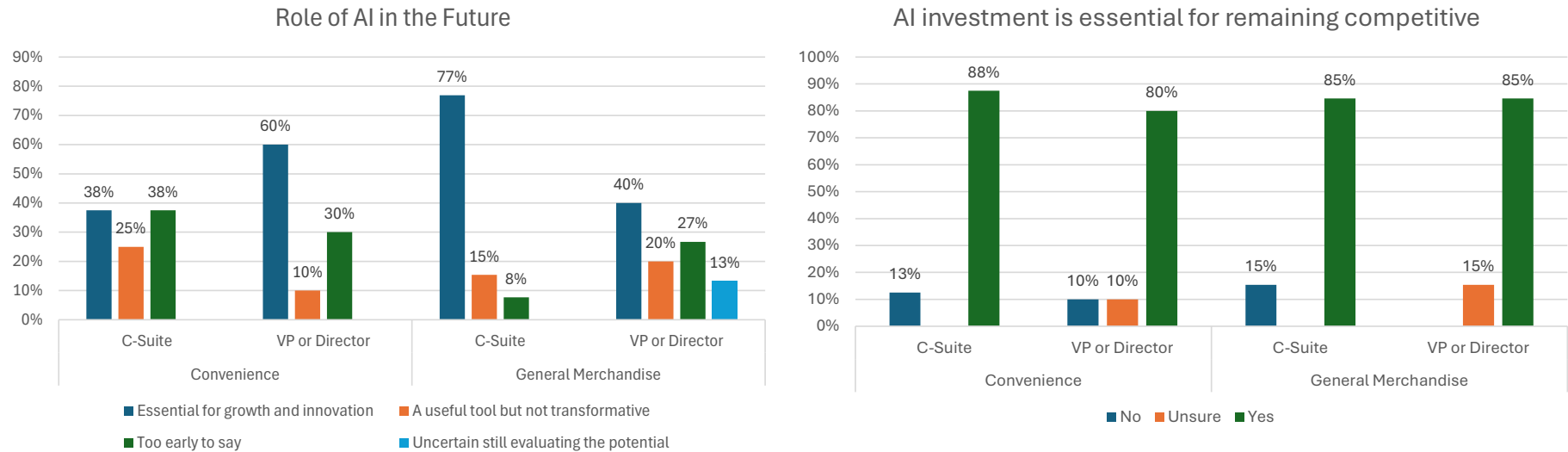
Convenience is stronger on the efficiency aspect while general merchandise sees it as more of a catalyst for innovation. This may be due to the types of applications using AI.

General merchandise has twice the real implementation and usage than convenience.



This difference is likely contributing to the great number of implementations and benefits being experienced by general merchandise.

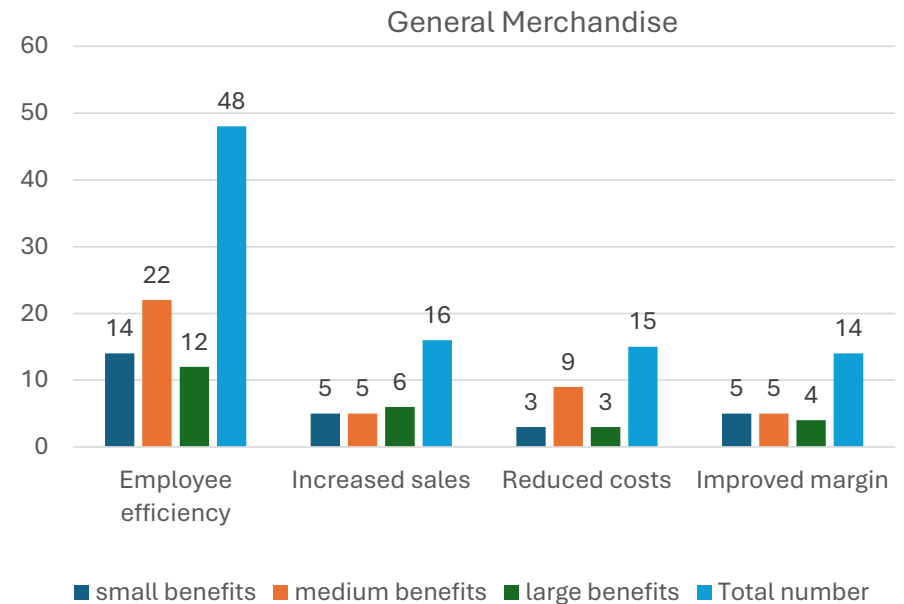
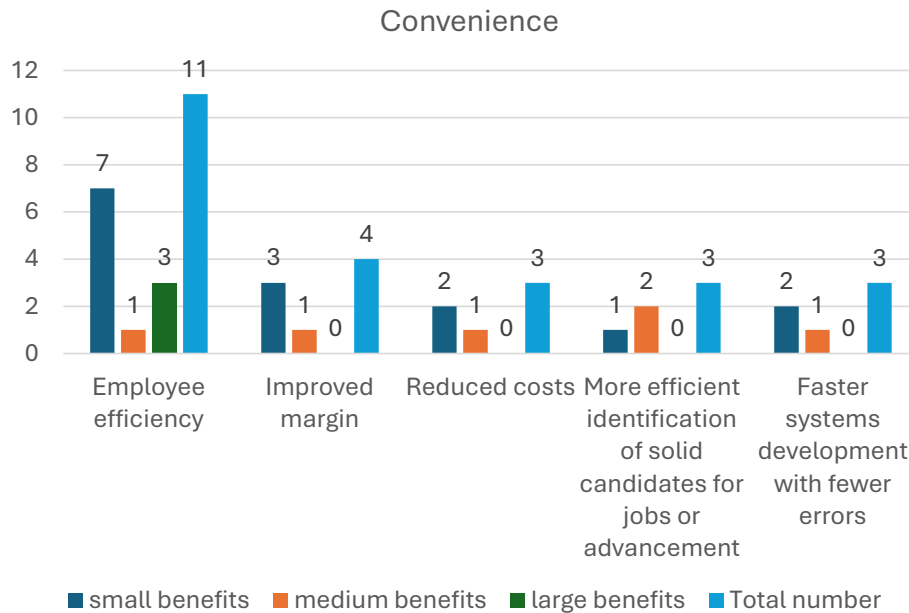
There are differing opinions between the C-suite and VP or Director about the future role of AI in retail.



- The C-suite is consistent in believing AI is essential for remaining competitive. VP or Directors slightly less so
- Convenience C-Suite believe it is a useful tool but not transformative, while VP or Directors are more positive on it being essential for growth and innovation
- General merchandise C-suite is more positive on it being essential for growth and innovation, while VP or Directors are not as sure.

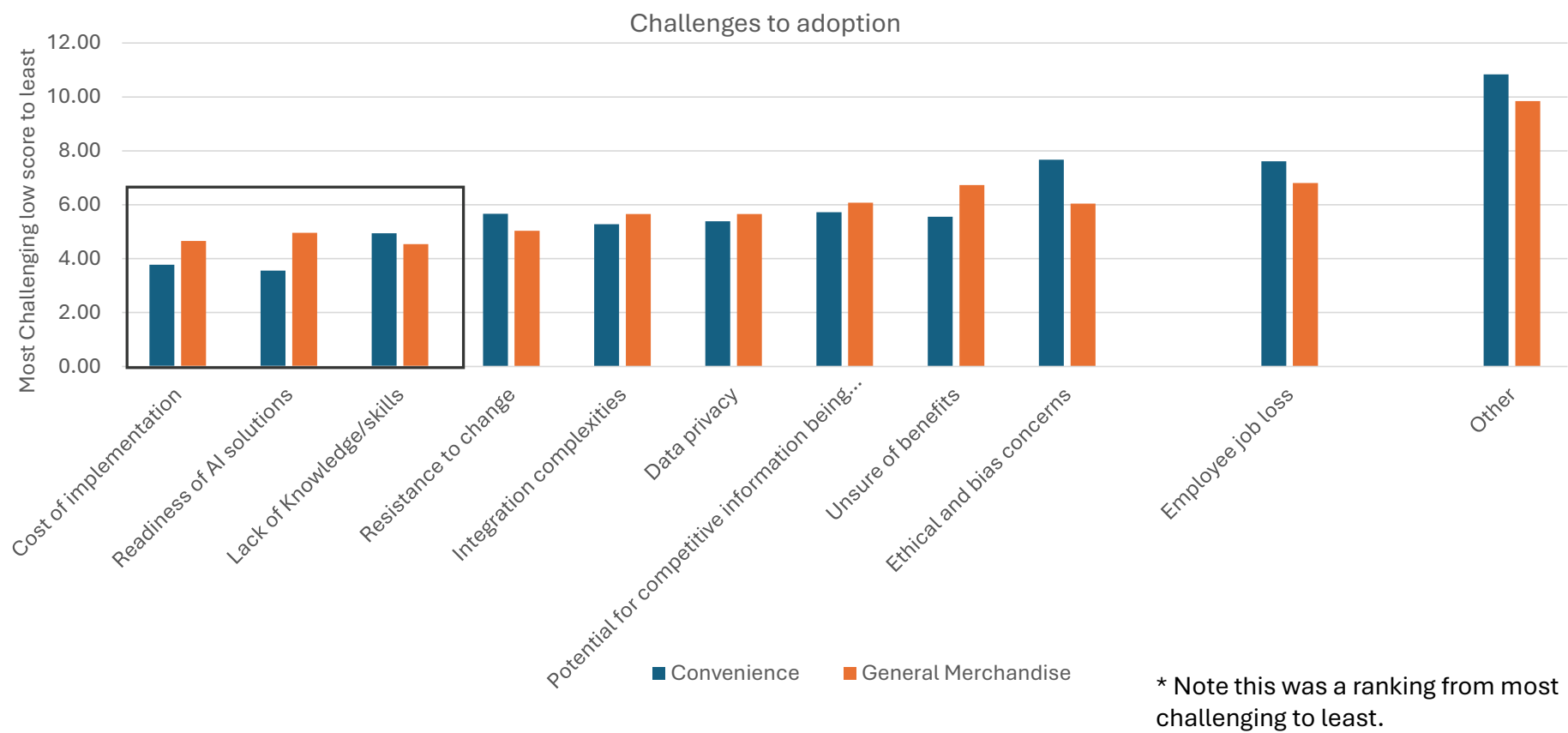
Note Percents are the percent of the title in each case

Employee efficiency is the largest benefit area for both convenience and general merchandise.

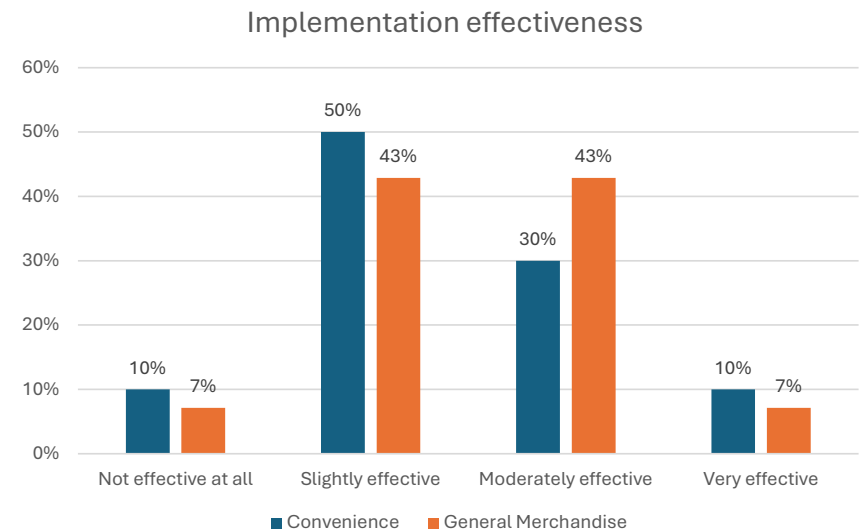
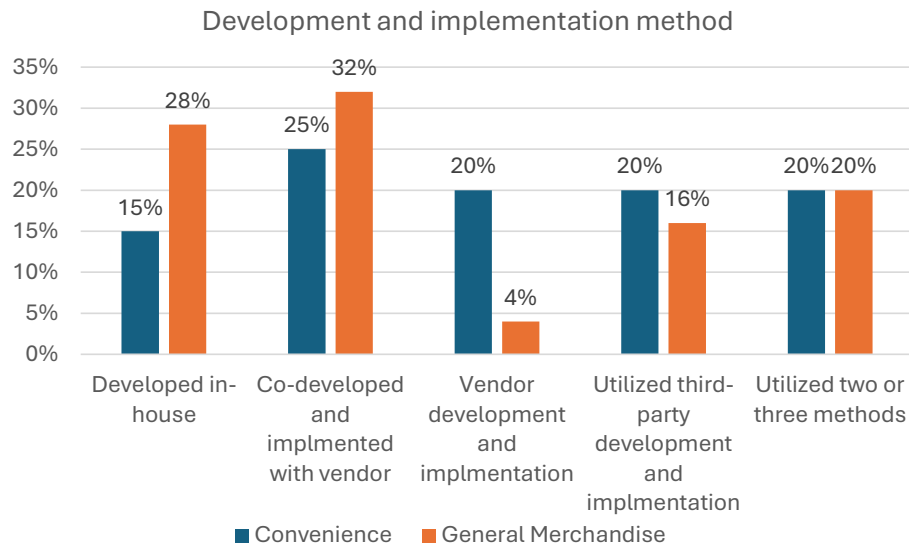


- General merchandise has more areas with large benefits.
- Convenience should explore if there are opportunities to increase the size of the benefits they are obtaining

Both retailers believe the three biggest challenges to adoption are cost of implementation, readiness of AI solutions and lack of knowledge and skills.*



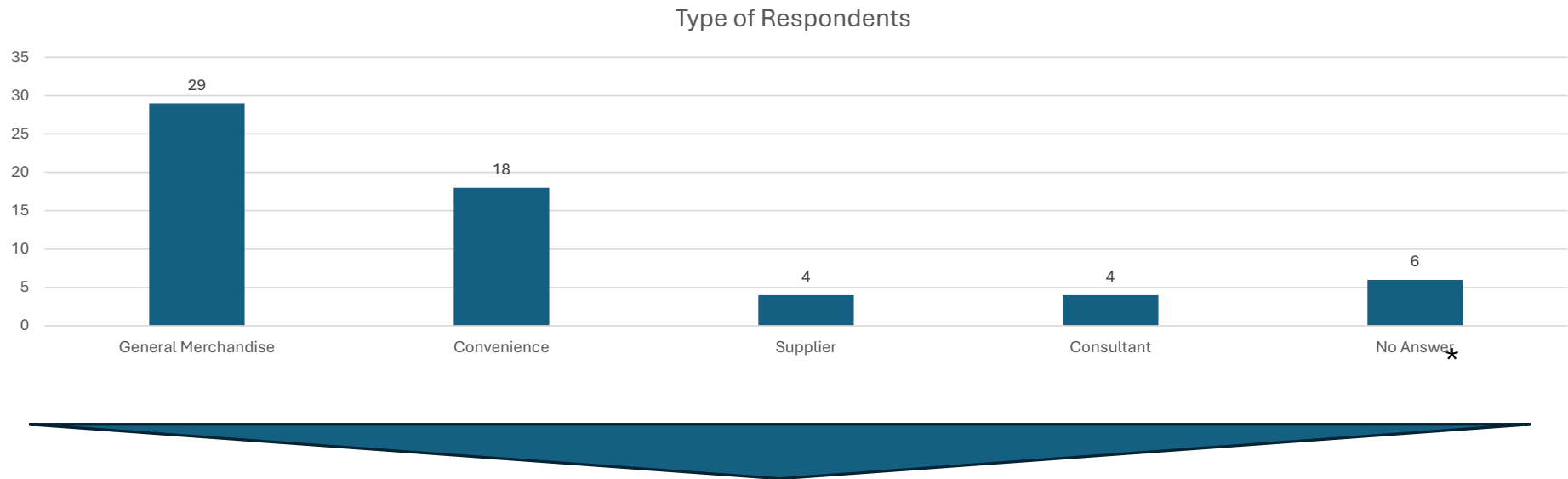
Convenience and general merchandise have different approaches to development and implementation with general merchandise achieving a more effective implementation.



- General merchandise's greater focus on non-vendor implementation seems to be more effective likely due to their knowledge of the business being integrated more effectively in the implementation
- Given the number of smaller convenience stores that may be the only option. Perhaps groups of non-competitive companies could work together with the vendors to improve effectiveness

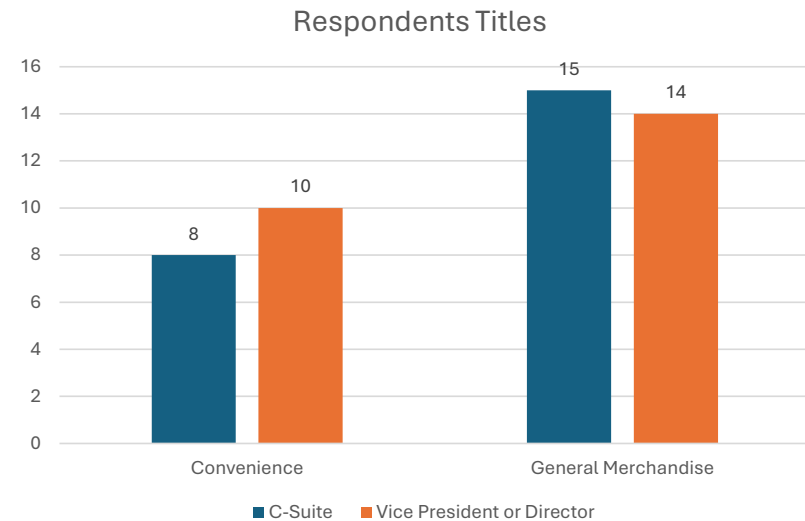
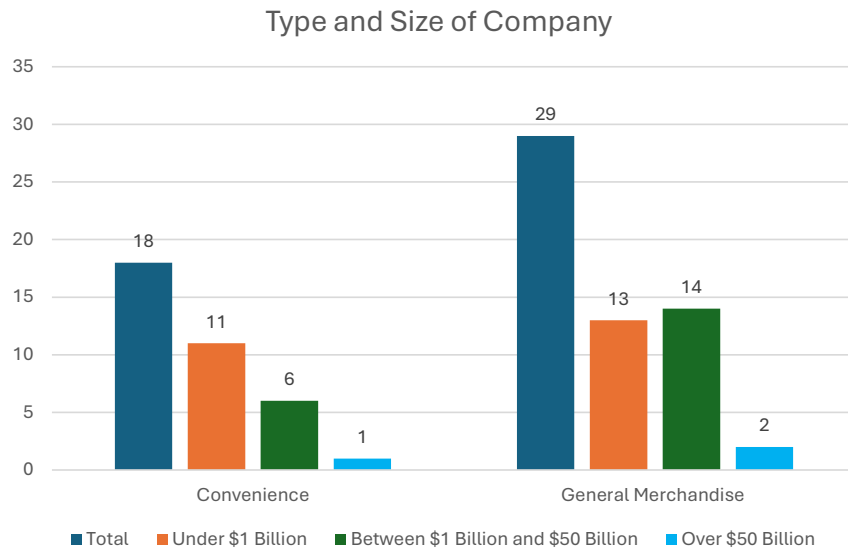
Respondents Background

All retail respondents were grouped as Convenience or General Merchandise. They are the focus of this presentation



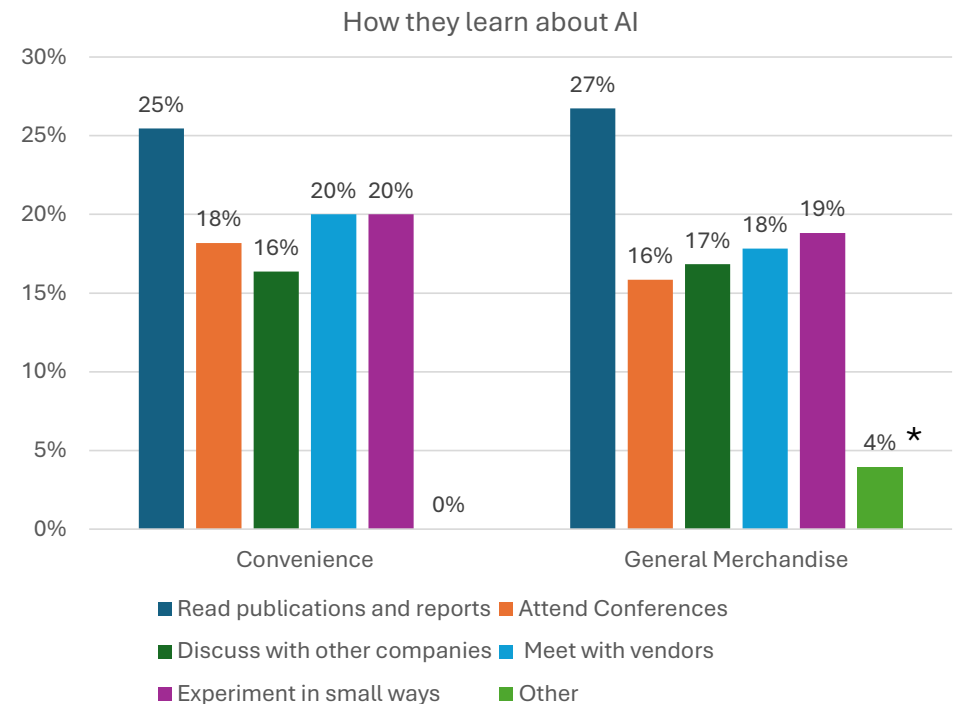
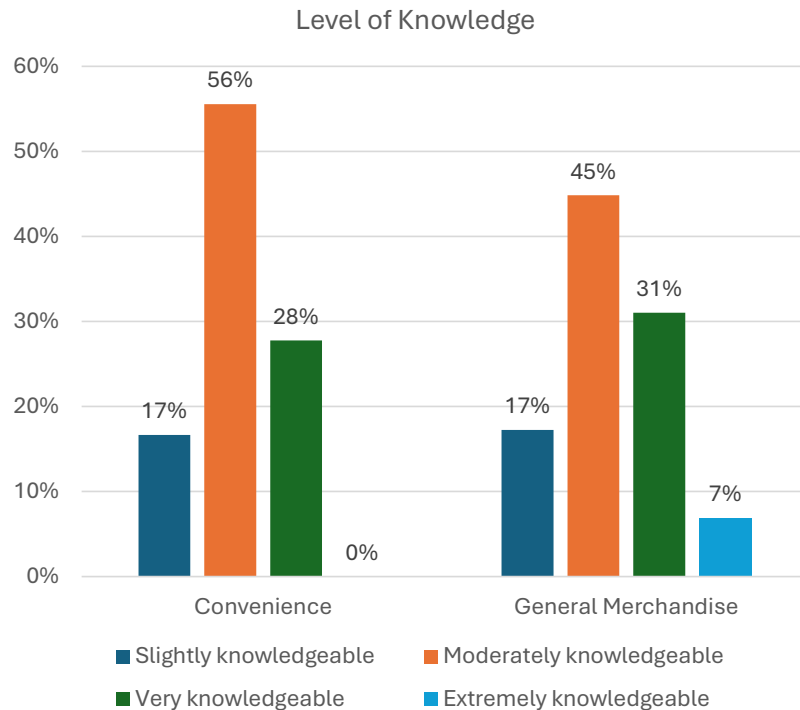
All respondents who did not specify Convenience as type were included in General Merchandise as there were not large enough groups to break down. These include for example footwear and apparel, electronics, beauty, Big Box, eCommerce, etc.

There are more large companies in general merchandise and more C-Suite than VP or Director



AI Background

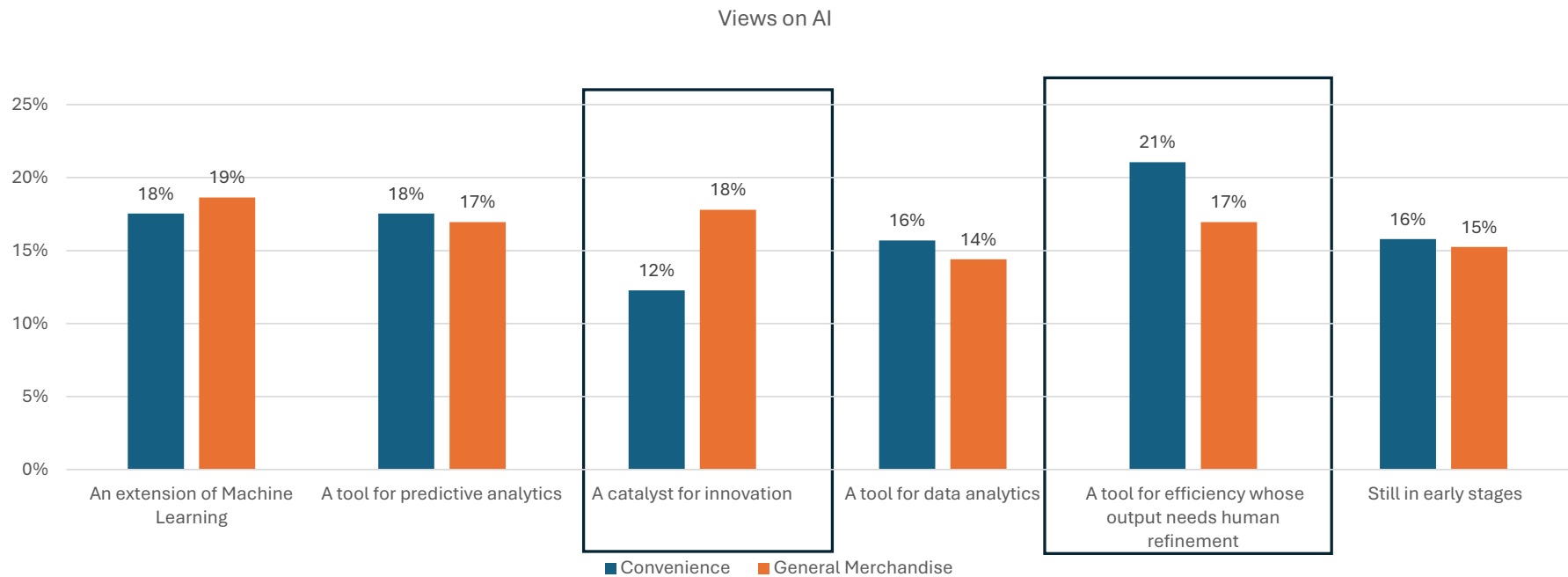
General merchandise a higher percentage of companies who are very or extremely knowledgeable.



- The difference is likely a result of the more implementations general merchandise has.
- The methods of learning about AI are basically the same.

* Includes Retail AI Council and building and using LLMs

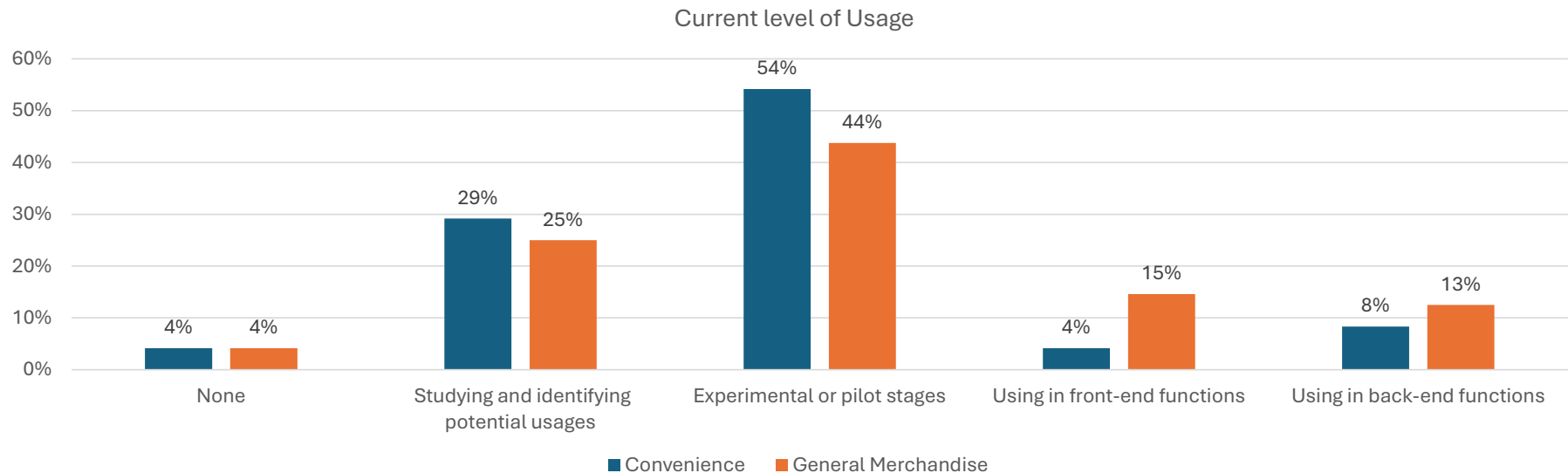
Both types of retailers have mostly similar views on the role of AI now and in the future.



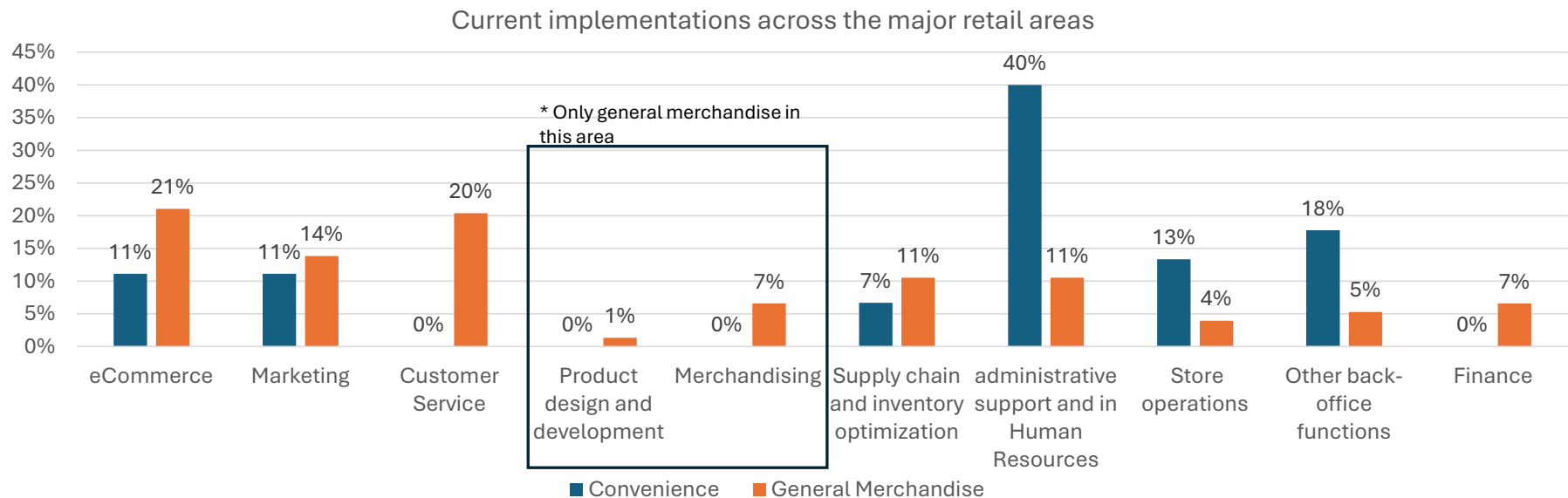
Convenience is stronger on the efficiency aspect while general merchandise sees it as more of a catalyst for innovation. This may be due to the types of applications using AI.

Current Plans and Usage

A larger percentage of Convenience retailers are in the experimental or pilot stages, but General Merchandise has a higher percentage of application usage.

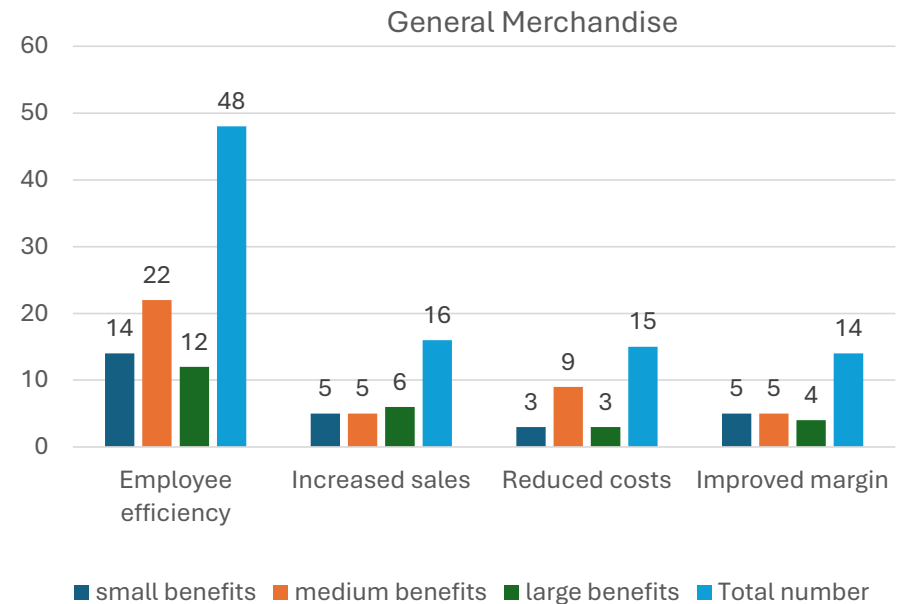
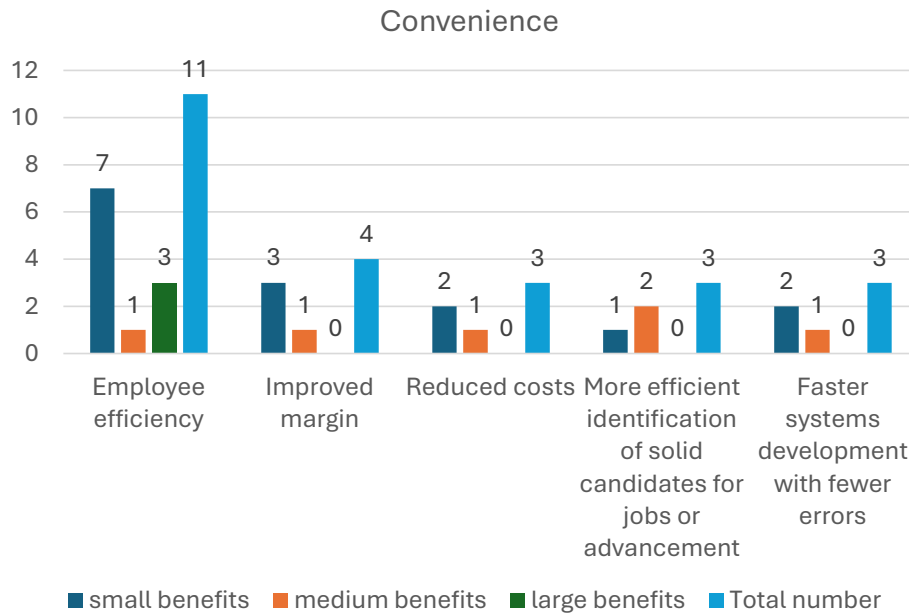


Convenience retailers focus more on back-office functions and stores. General merchandise focuses more on eCommerce, customer service, along with merchandising and product.



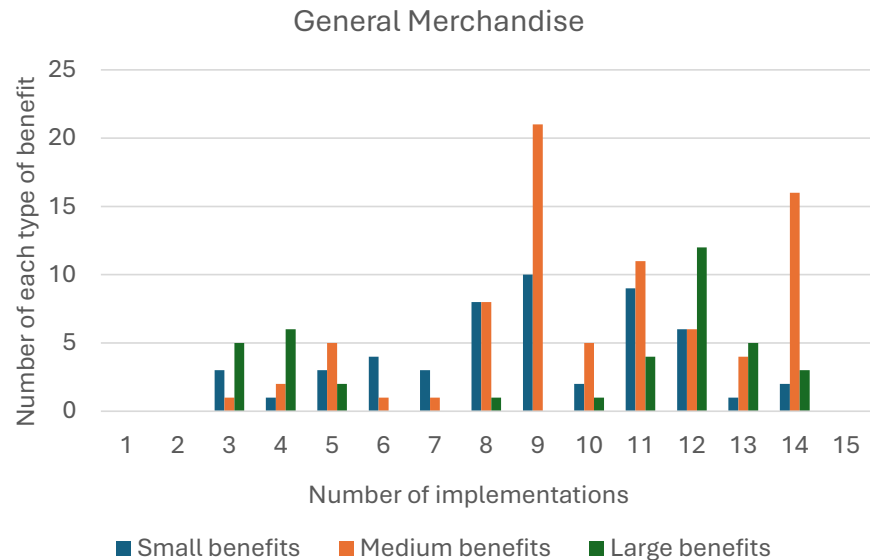
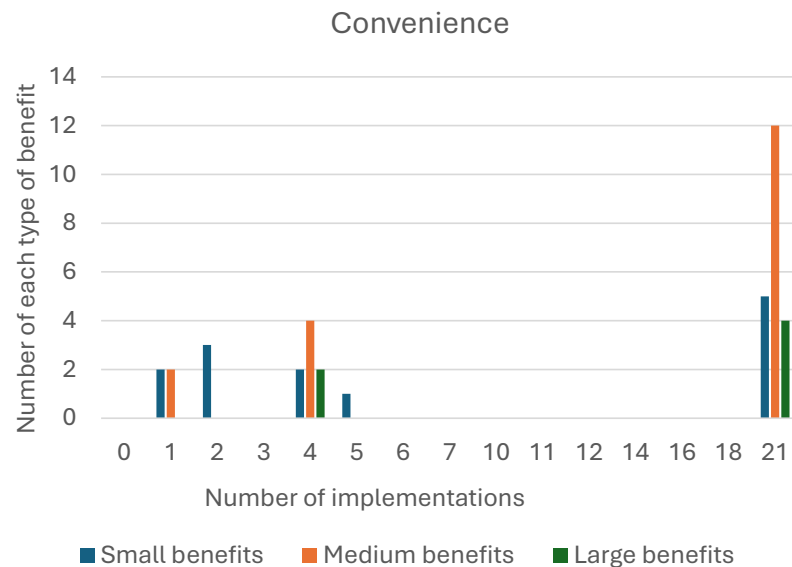
- There are opportunities to learn from one another in areas where implementation levels vary. Creating a group or expanding an existing one to include a variety of types of retailers would provide an opportunity to learn from each other.
- This exchange of experiences could lead to broader uses of AI and greater benefits.

Employee efficiency is the largest benefit area for both convenience and general merchandise.

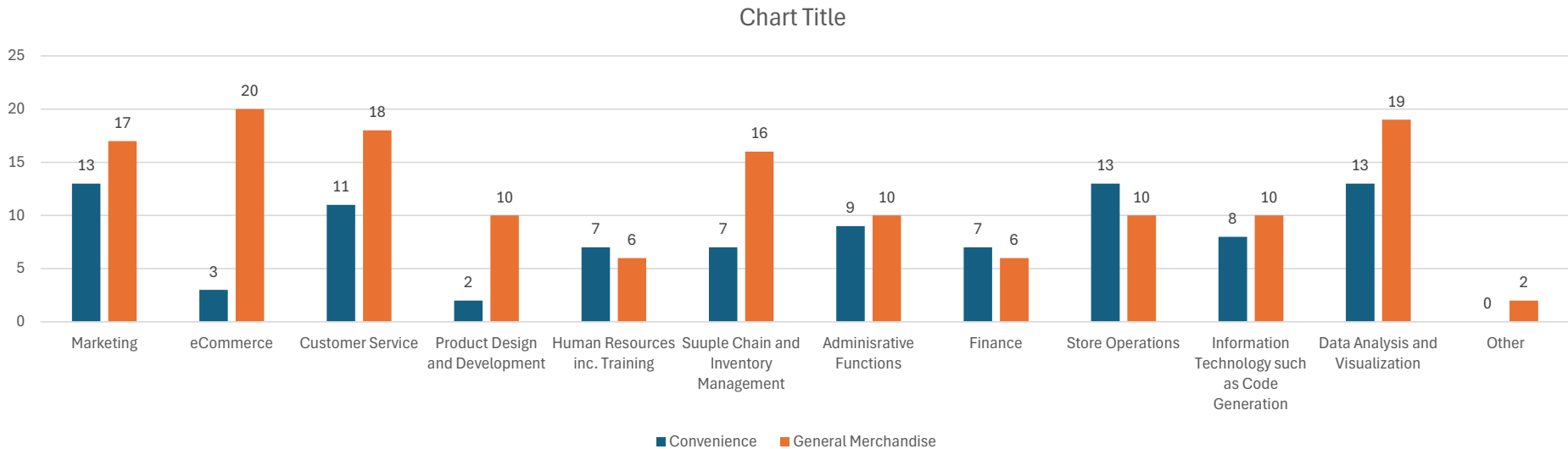


- General merchandise has more areas with large benefits and is receiving increased sales
- Convenience should explore if there are opportunities to increase the size of the benefits they are obtaining

As the number of implementations increased the number of benefits increased and were larger but there is not a strong correlation



Both convenience and general merchandise have substantial plans for expansion of AI in the next three years.

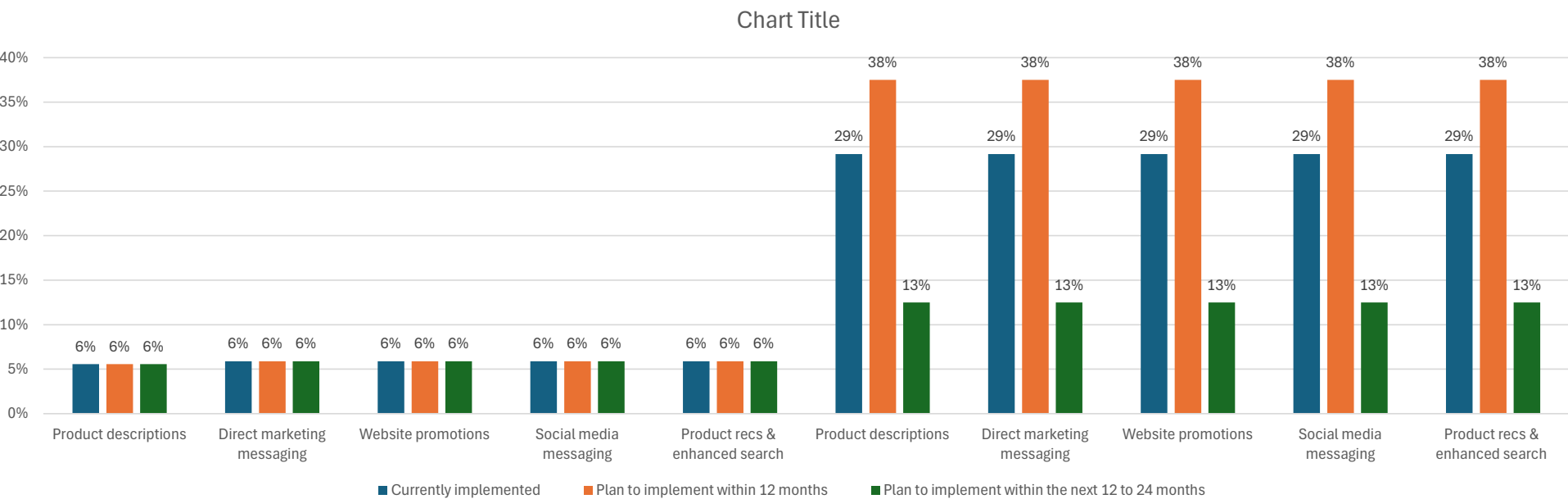


- Convenience is focusing on expanding into areas where general merchandise is more active today.
- General merchandise is adding more back-office type areas while continuing to increase in customer focused and marketing areas.
- Other includes CRM insights and behavior analysis and sales

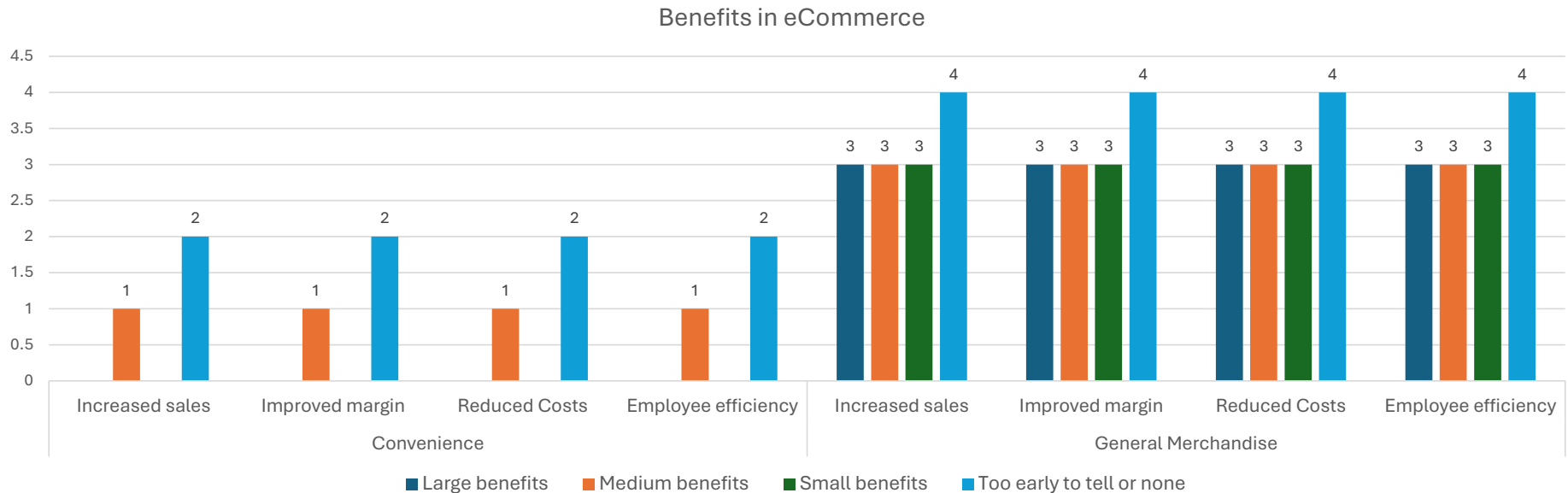
Current and Planned Implementations and Benefits

What is being done and what is being achieved

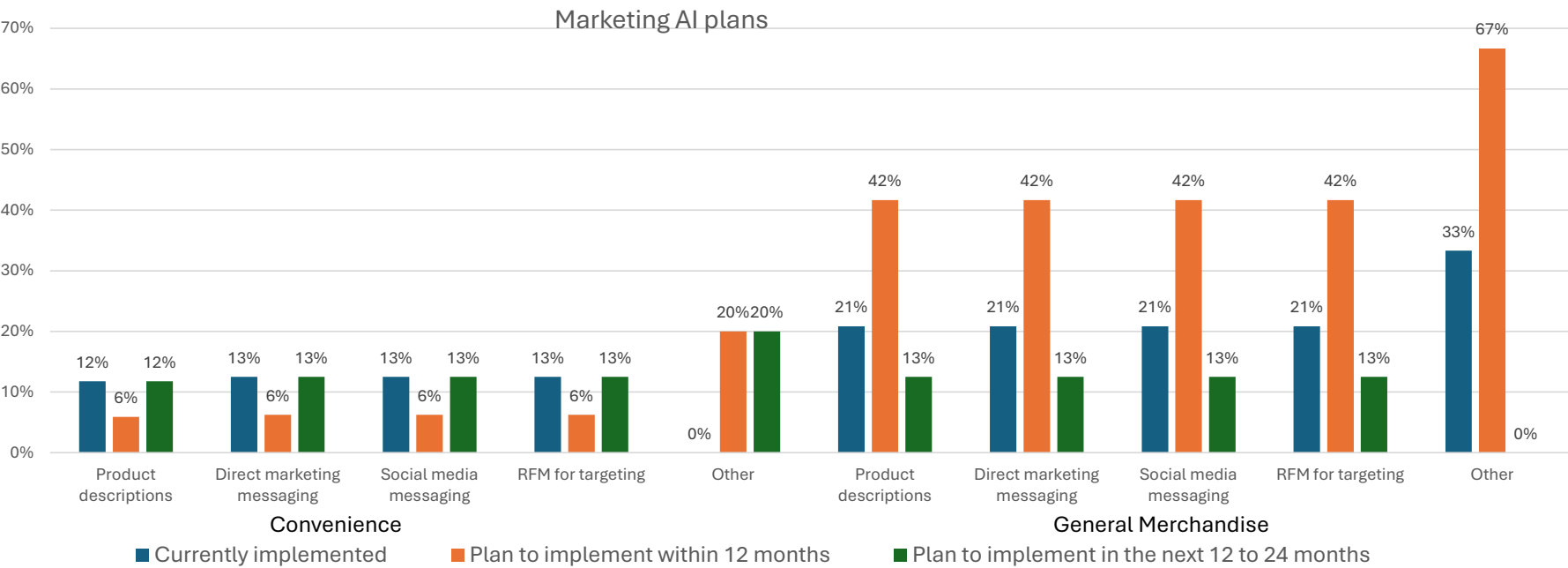
Given most general merchandise retailers are omni-channel. The focus on eCommerce is logical both for the current and future.



eCommerce benefits are in all areas and size range of benefits but a small number of companies

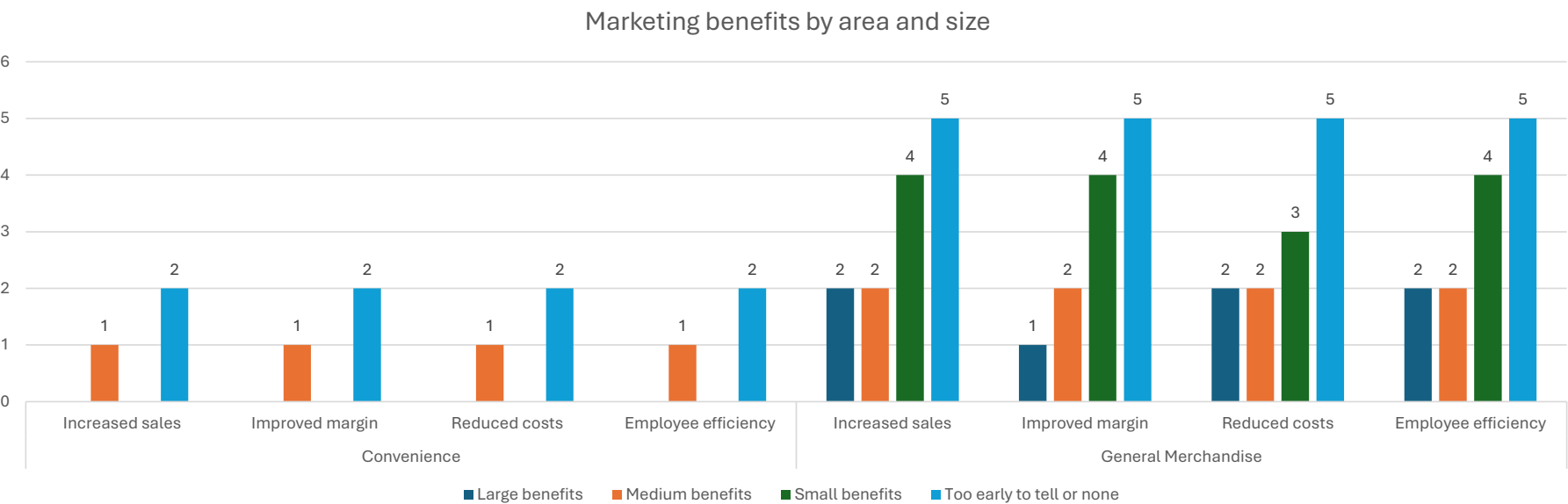


Convenience might want to learn more about the marketing AI uses in general merchandise do see if there are opportunities



Customer responses and feedback is the other mentioned. Others had plans but did not specify the area.

Both types of retailers have substantial areas in marketing where it is too early to identify the benefits.



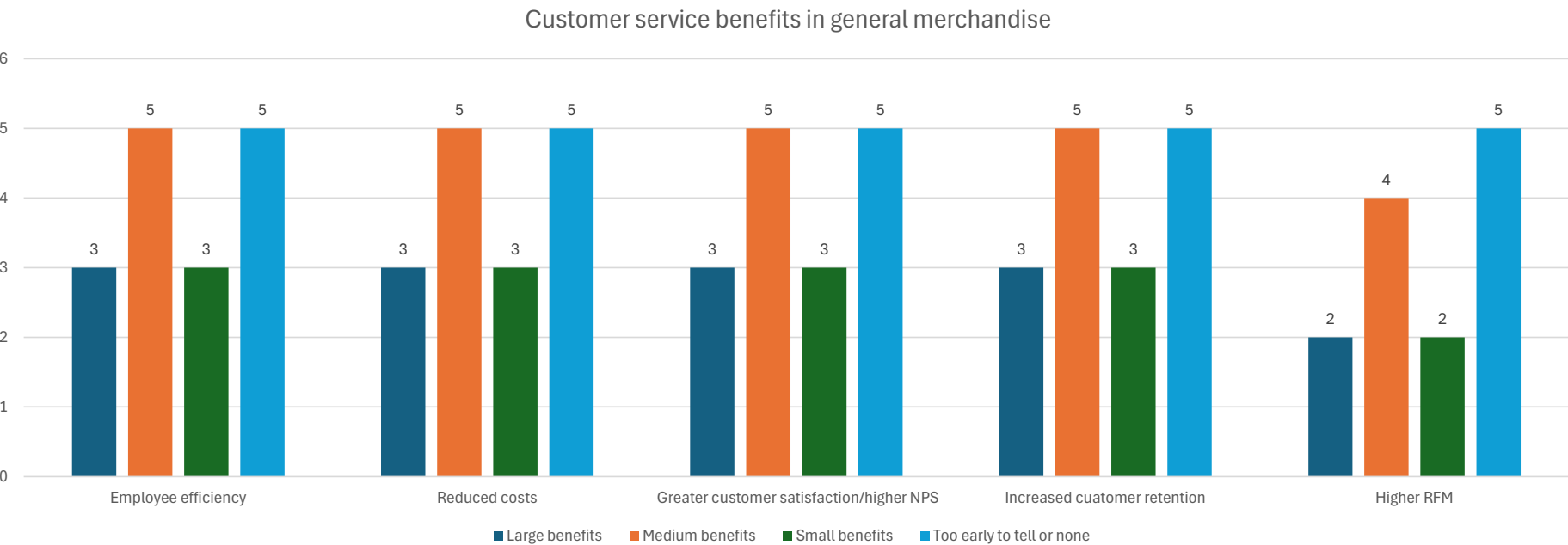
General merchandise has more large benefits. Convenience may have an opportunity to learn from them

General merchandise has more current customer service implementations with more planned. Convenience stores can explore to see what ideas might be good for them

- Product recommendations online
- Recommendations for add-on products online
- Product suggestions in store to customers via store personnel.
- Product suggestions direct to the customer in the store
- Chat bots online for questions such as order status, product questions, etc.
- Enhance RFM results
- User Experience design and optimization in eCommerce

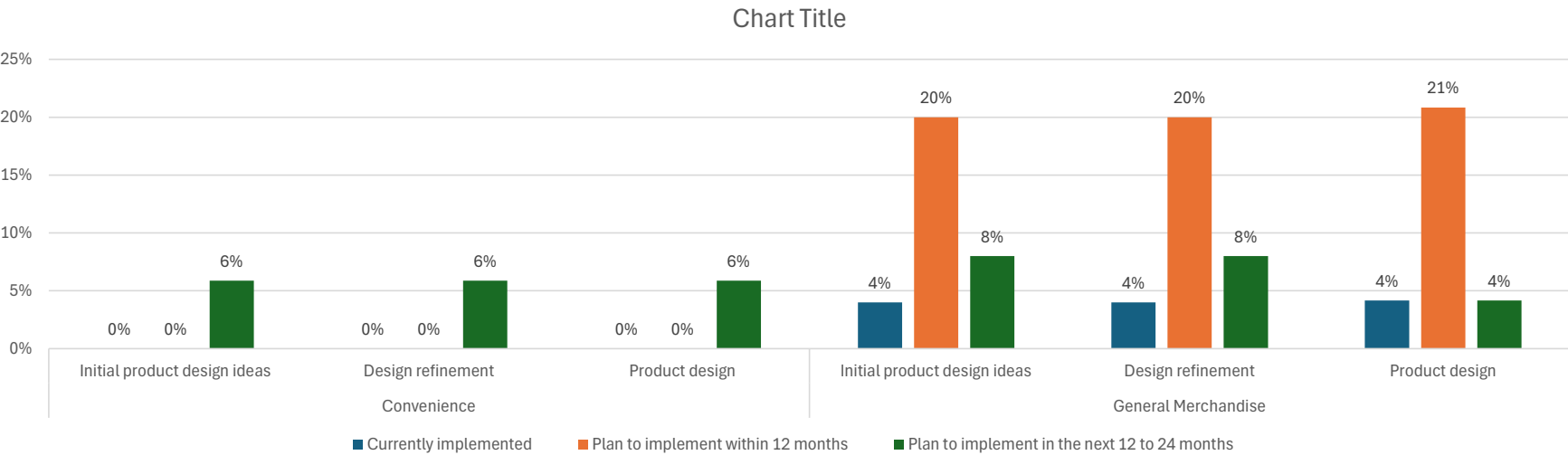


Customer service benefits are across all benefit areas but again small numbers



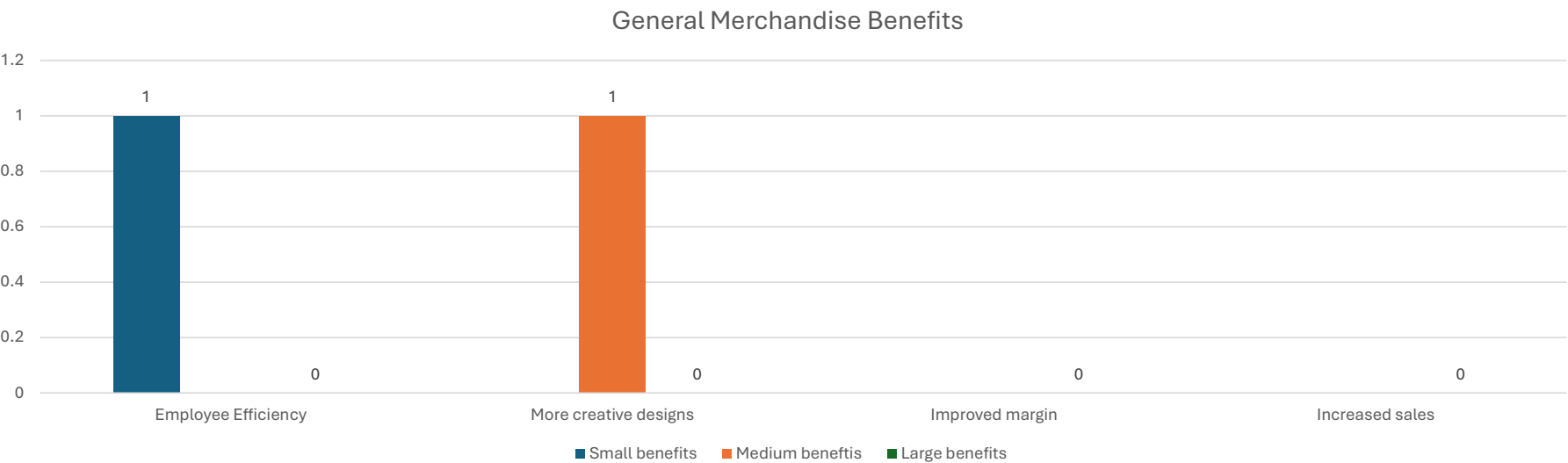
Note: There are no convenience implementations in this area

Convenience has no current or short-term plans for product design and development. Even general merchandise has limited usage.



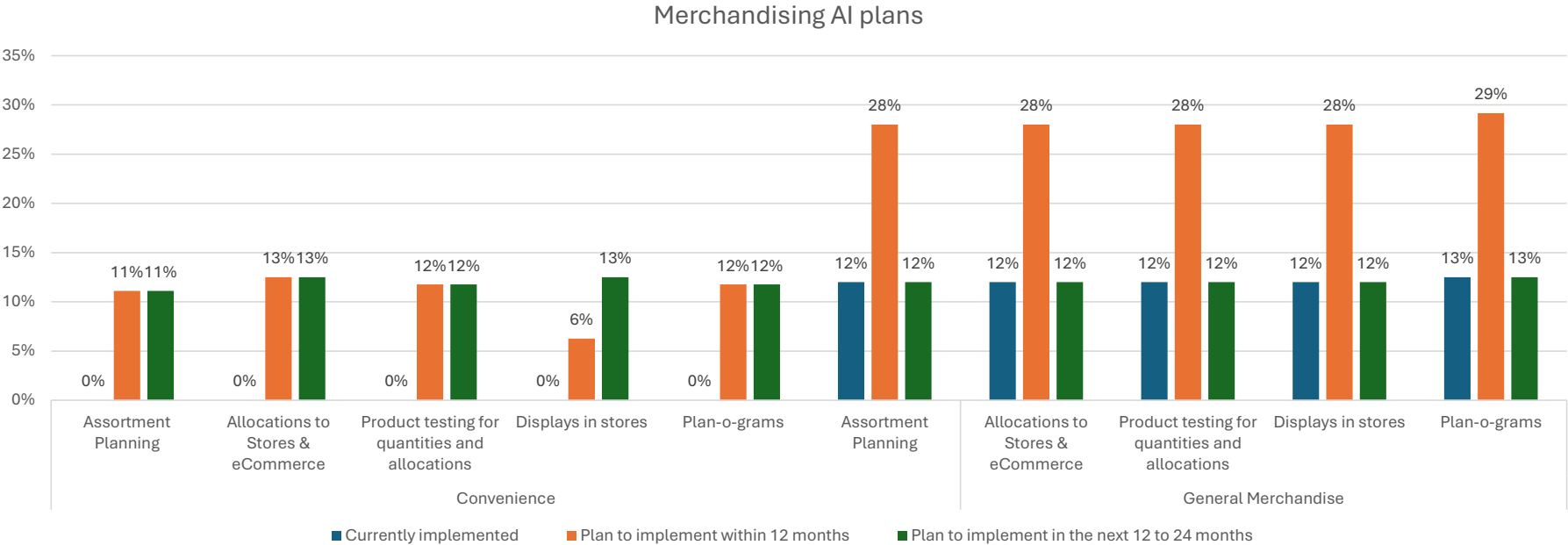
This is an area which will require more research and experimenting for both types of retailers

General merchandise is obtaining limited benefits. Product design needs more thinking to increase implementations and understand potential benefits



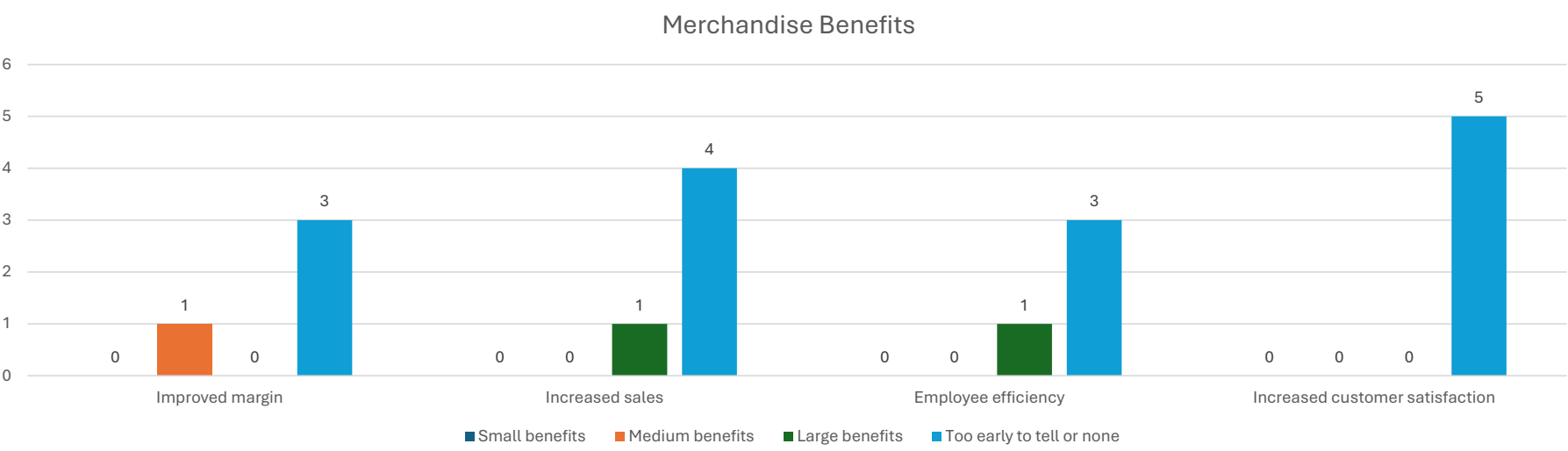
Note: There are no convenience retailer implementations in this area

There is limited usage in merchandising today but there are plans.



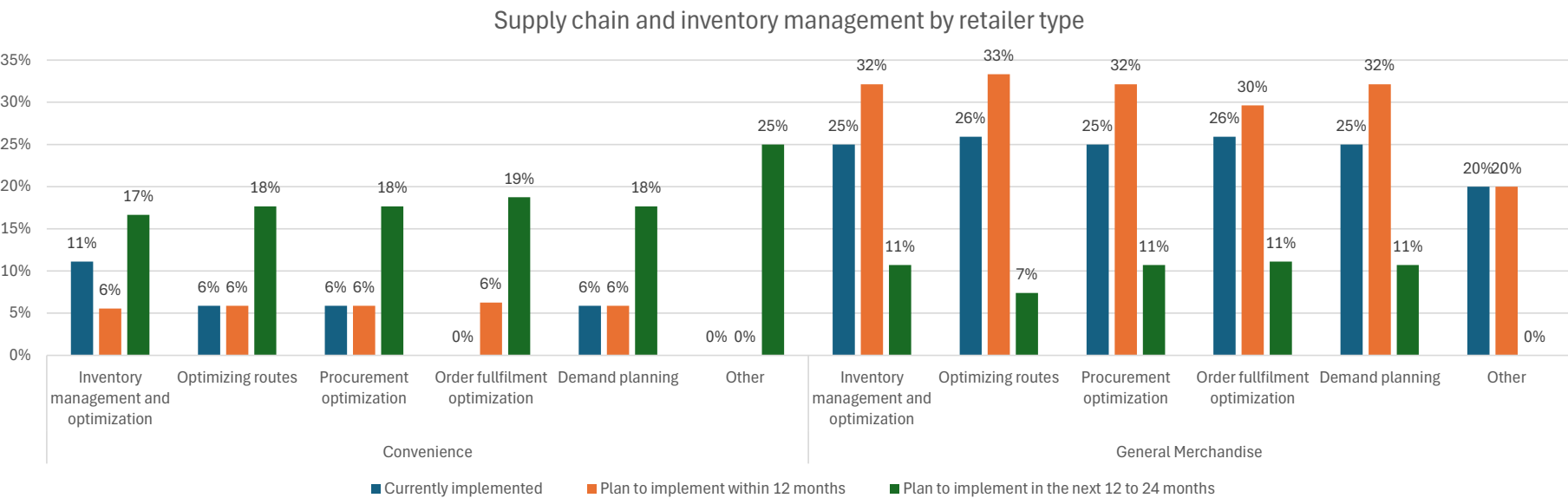
Convenience has limited plans in this area. Talking to general merchandise retailers might give them ideas for usage.

Merchandising benefits are generally too early to tell



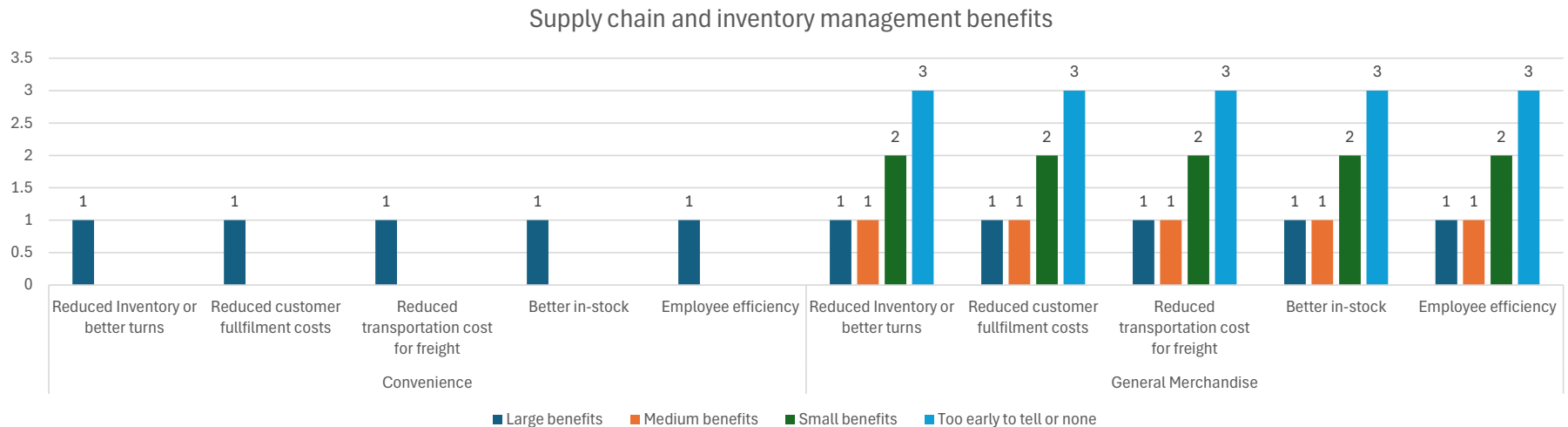
Note: there were no convenience implementations in this area

Supply Chain and inventory management is more widely used in general merchandise

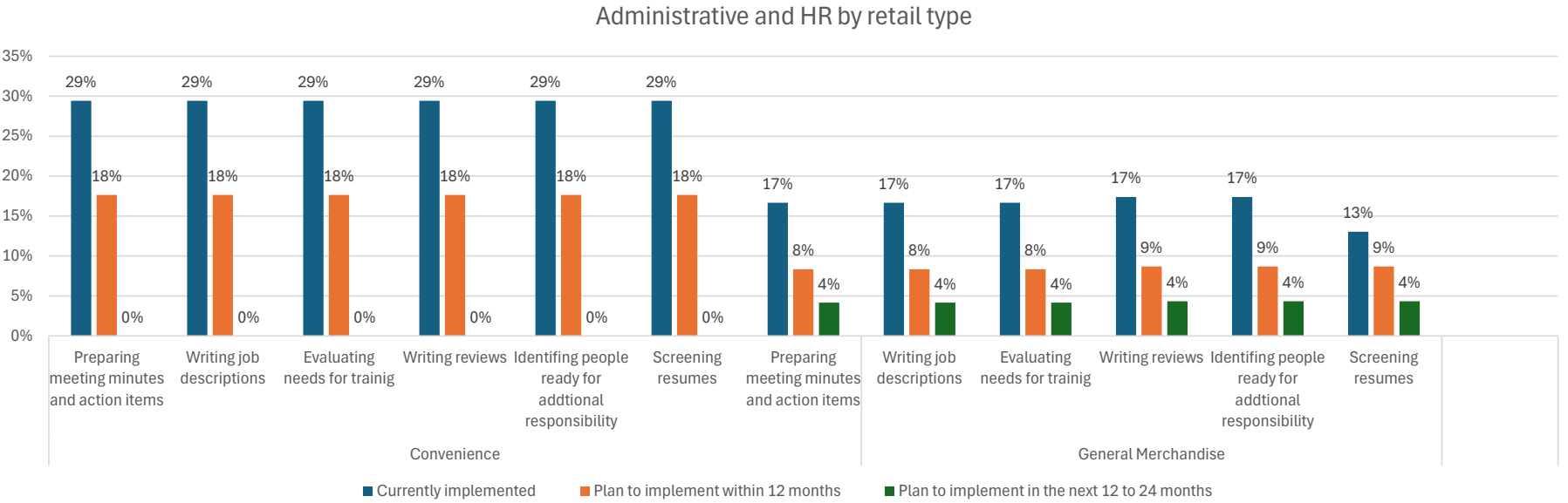


The greater focus by general merchandise may be due to more complicated supply chains and higher cost of inventory. It should be beneficial to convenience due to shelf life of products

Supply Chain and inventory management benefits are being obtained by both retailers in small numbers, but there are large benefits.

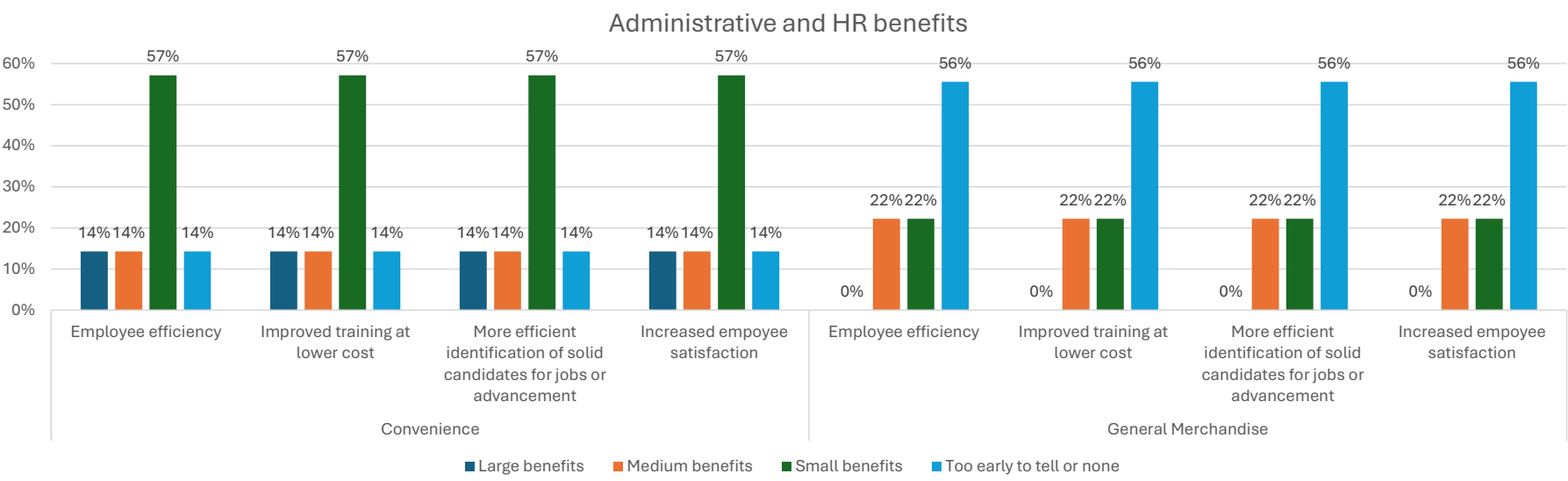


Administrative and HR plans are greater in convenience for both implemented and plans for the next twelve months as well.

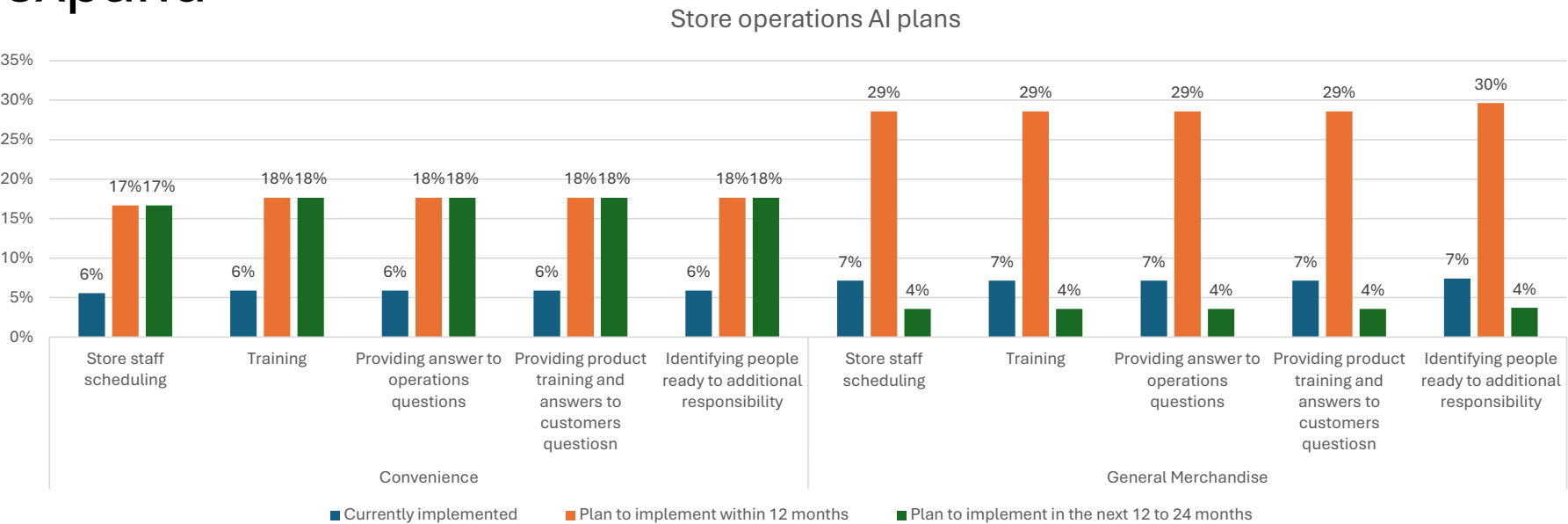


This is an area where machine learning and early AI tools have been used so the level and plans is not surprising. Convenience runs leaner in this area so the benefit of having tools to reduce the workload is strong

Administrative and HR plan benefits are similar across both retailer types with large benefits being achieved

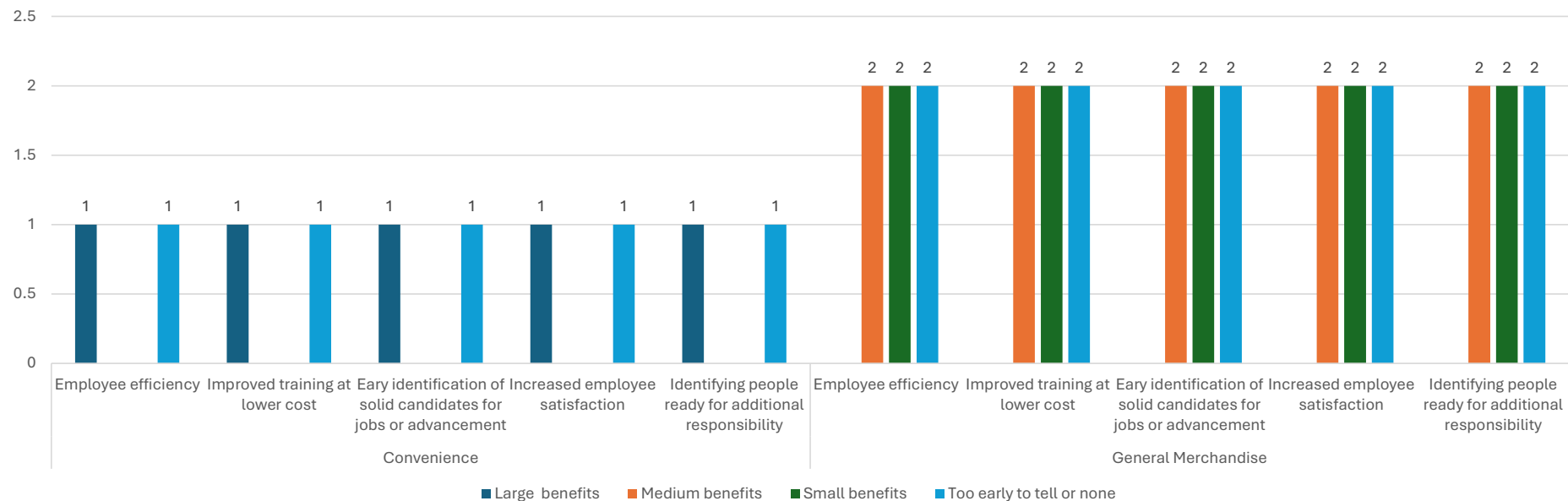


Store operations is currently implemented in both retailers with plans for the next twenty-four months to expand



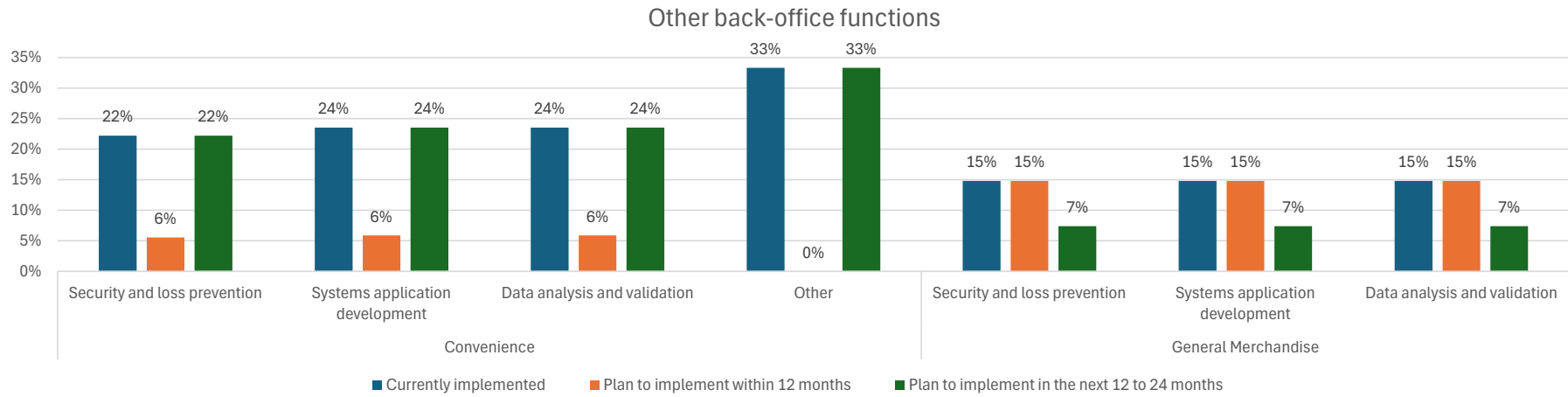
Store operations benefits are again being achieved by a very small number of companies.

Store operations benefits



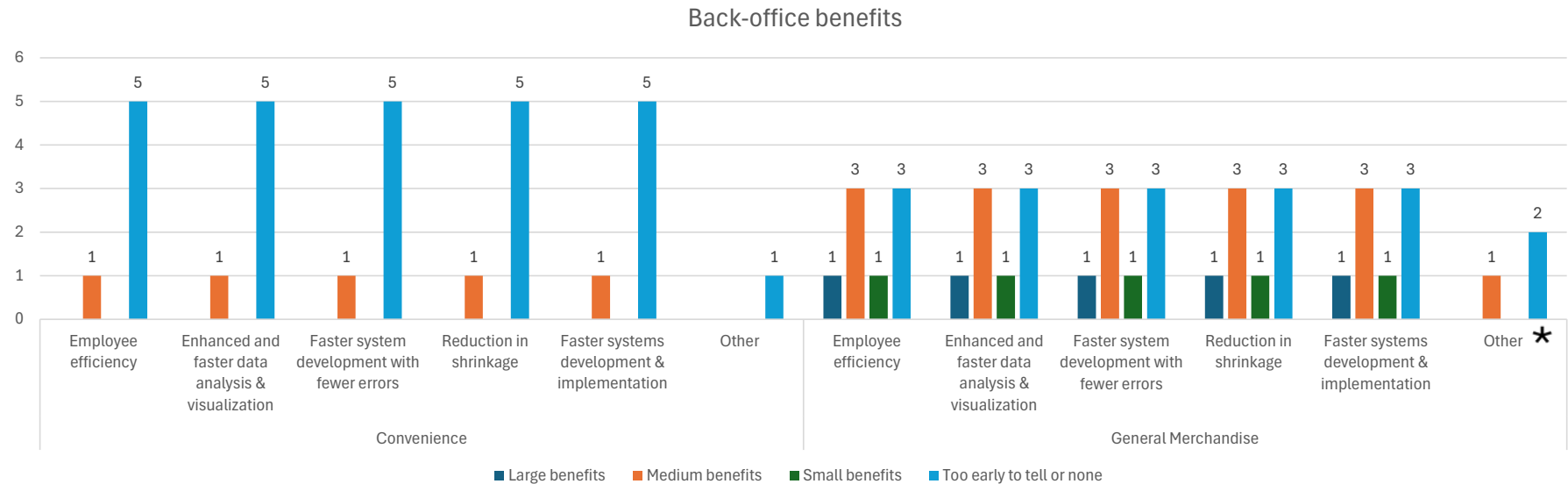
Convenience retailers are seeing large benefits while general merchandise is achieving medium and small

Other Back-office functions have been implemented more in convenience retailers.



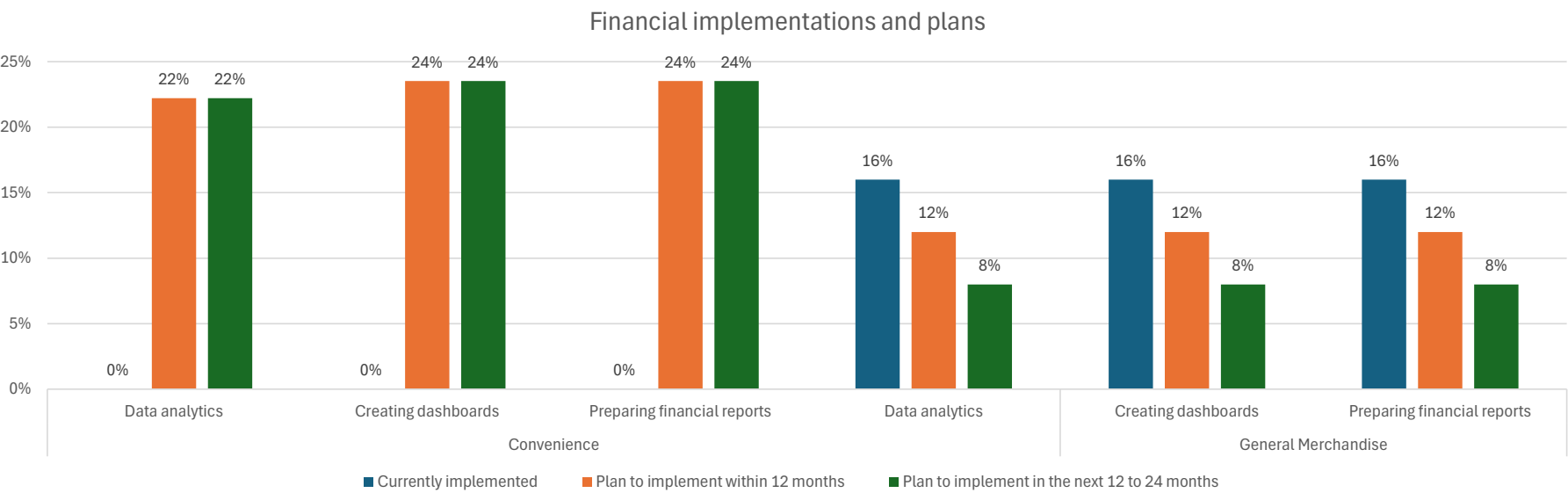
Given the emphasis on other areas by general merchandise it is not surprising they have not done as much as convenience retailers. The other in convenience retailers is a Veesion camera

Back-office benefits are medium in convenience while in general merchandise there a range of benefits from small to large

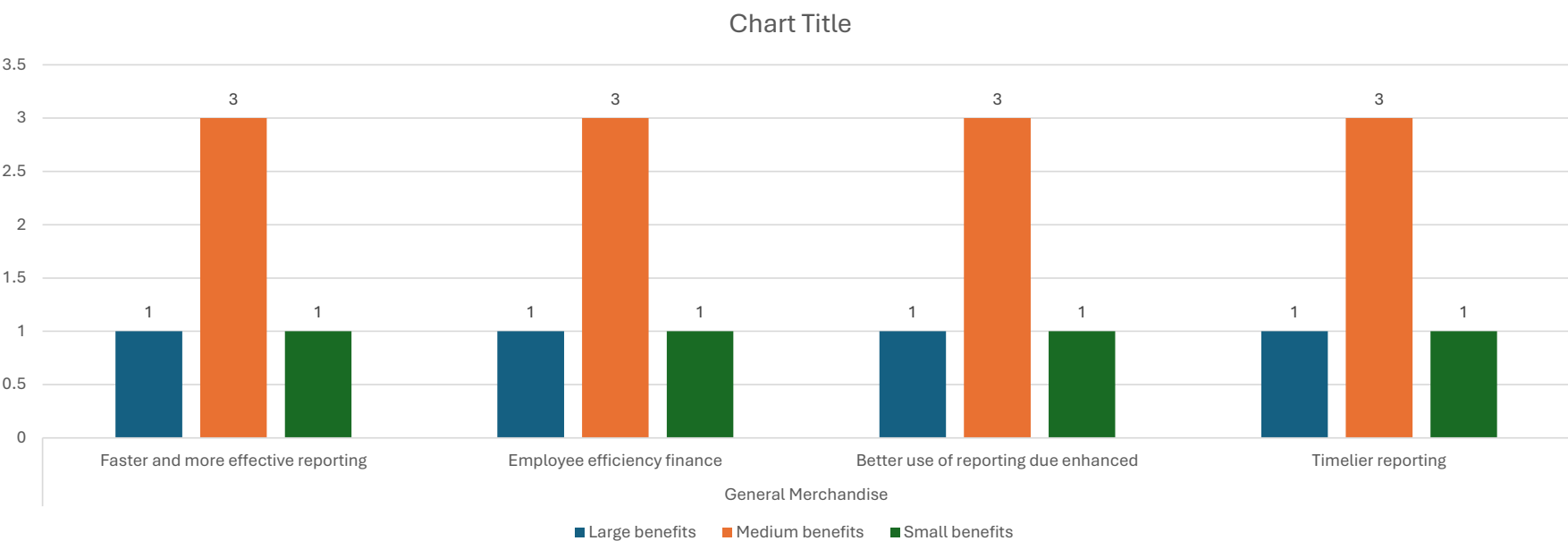


* Other is online fraud prevention

General merchandise has more financial areas implemented with convenience expecting to implement more in the next twenty-four months



Finance benefits are efficiency related with the full range of benefits

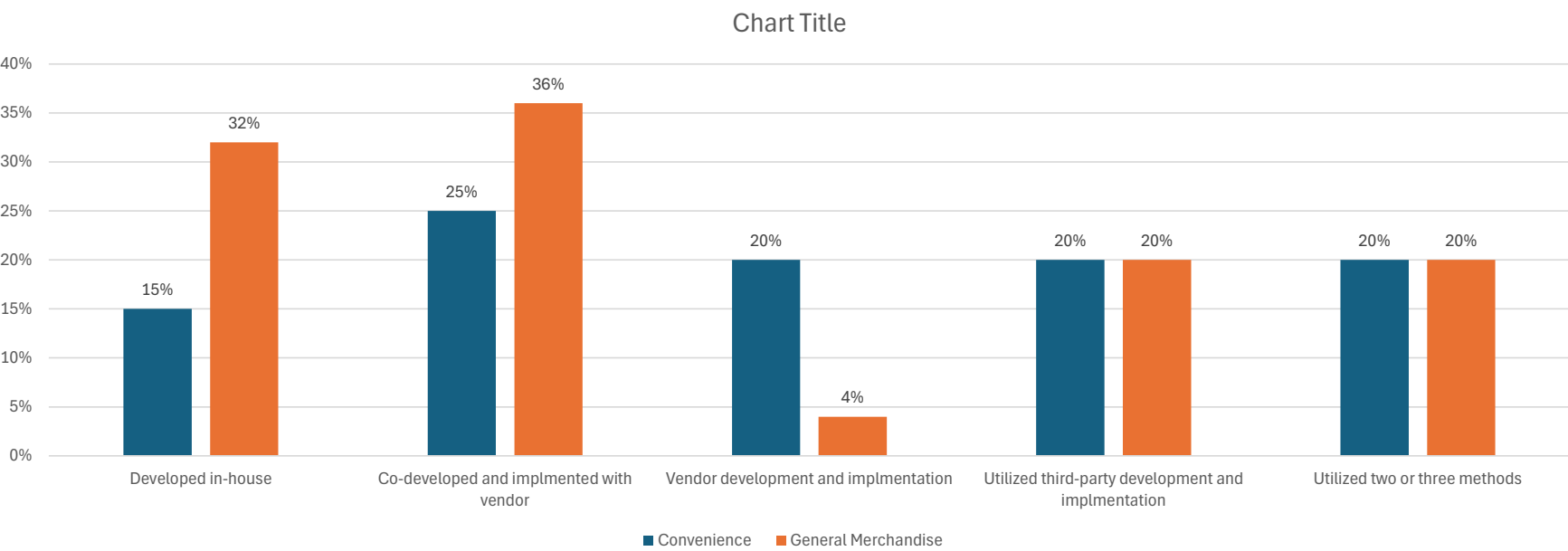


Note: Convenience has not implemented AI in Finance

Implementation experience

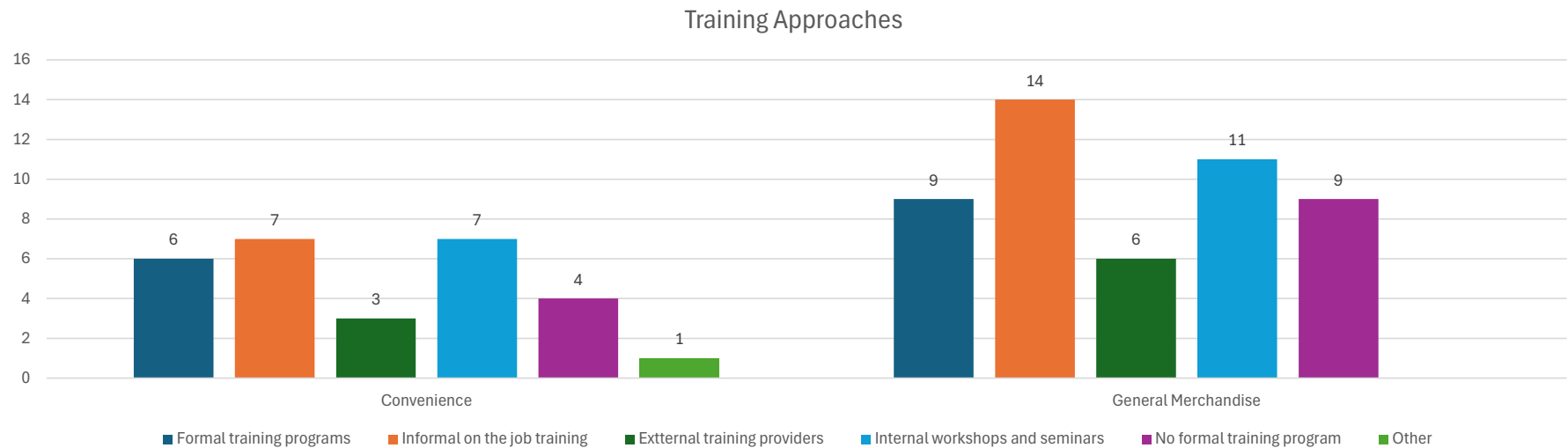
Approaches, challenges, relationship to benefits

Convenience and general merchandise have different approaches to development and implementation



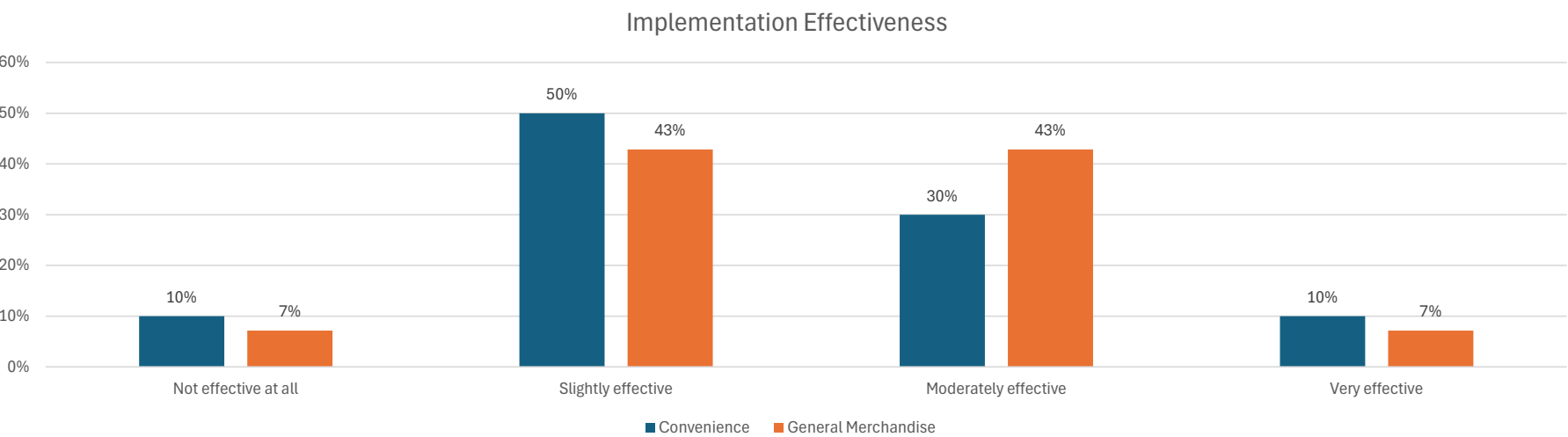
General merchandise has limited usage of vendor development and implementation more than convenience.

Training approaches have used multiple methods in both types of retailers

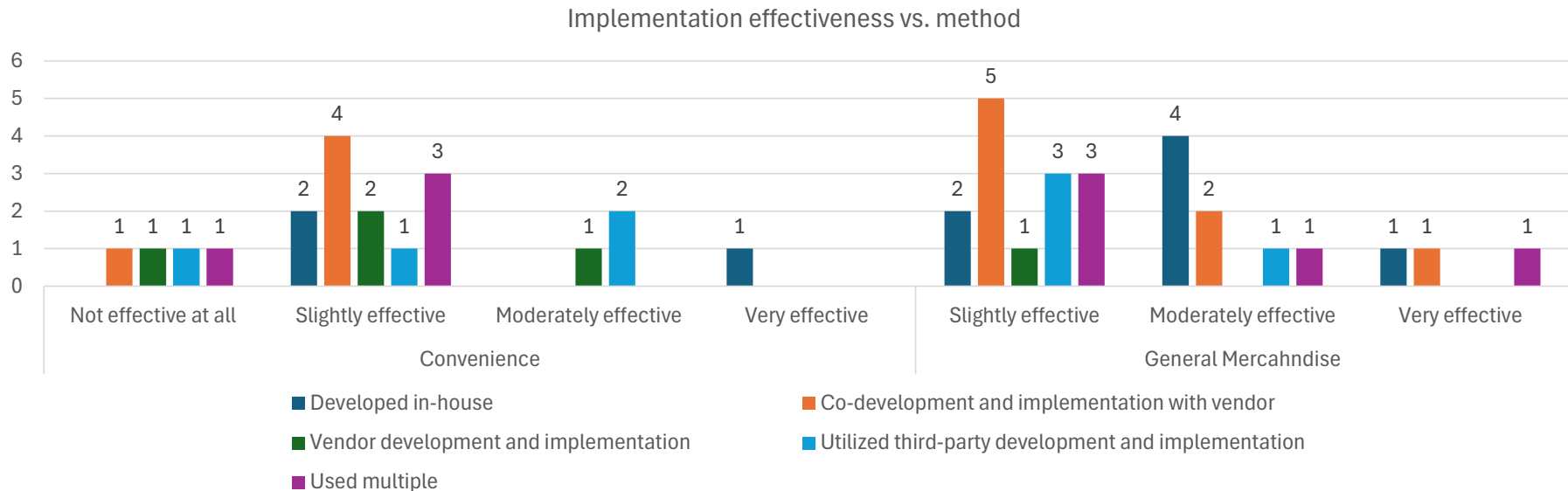


Comparing the method of training to implementation effectiveness did not yield a best practice.

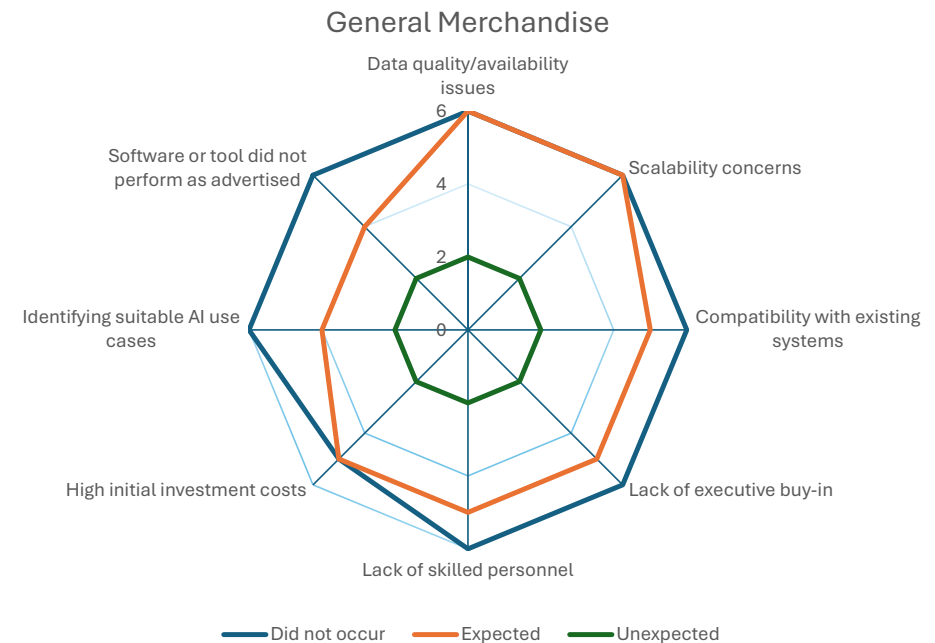
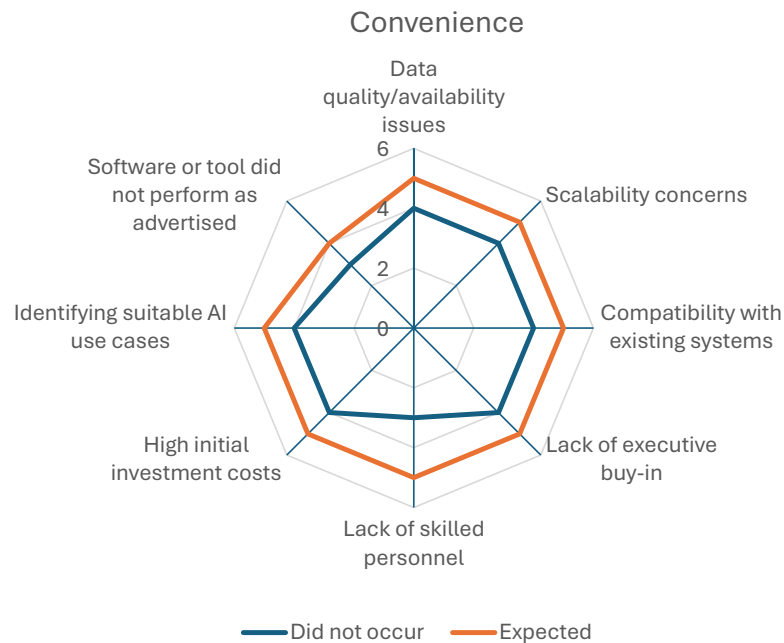
Implementation effectiveness has been slightly greater for general merchandise



Implementation effectiveness varied with the method with vendor development and implementation being less effective but very small numbers

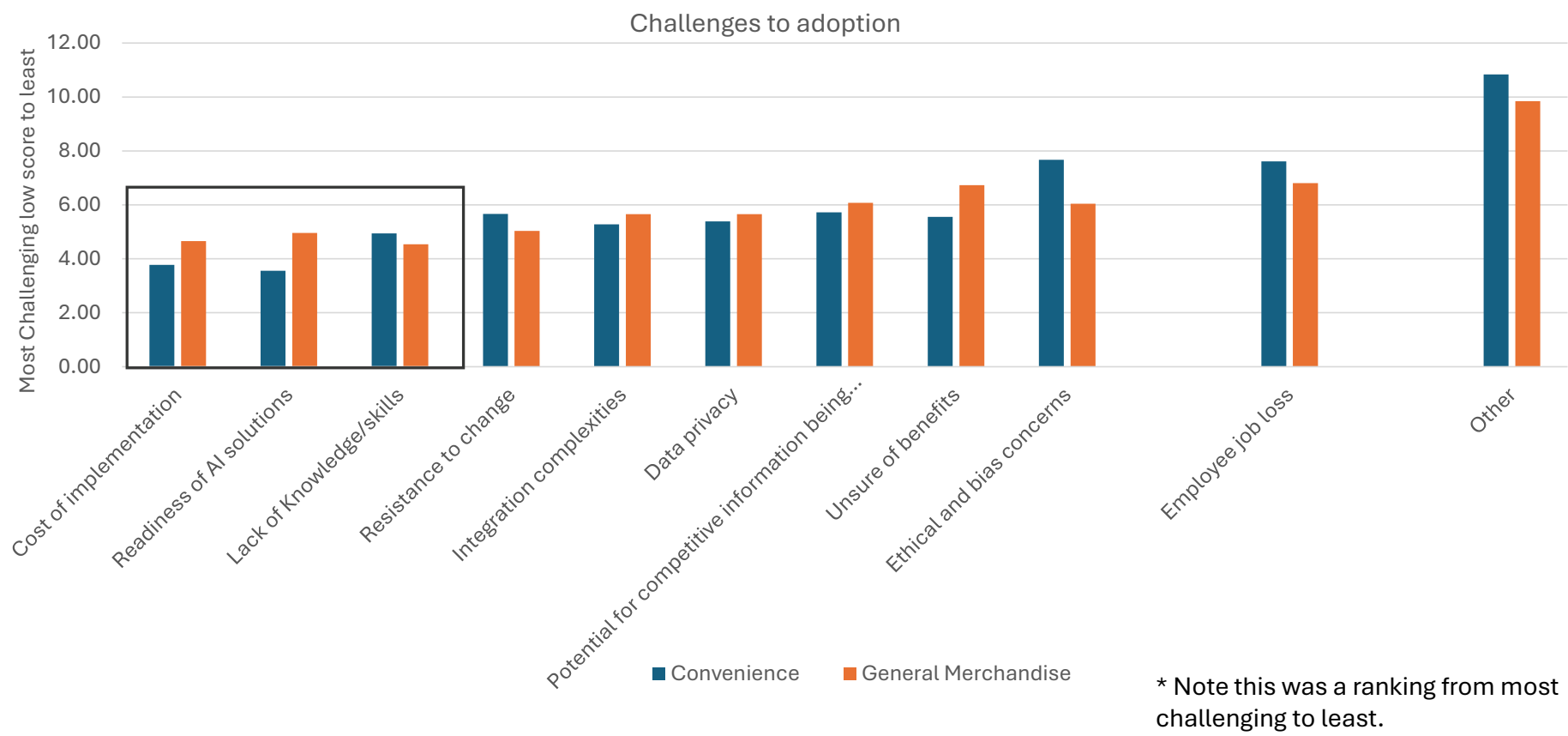


General merchandise had challenges that were not expected.



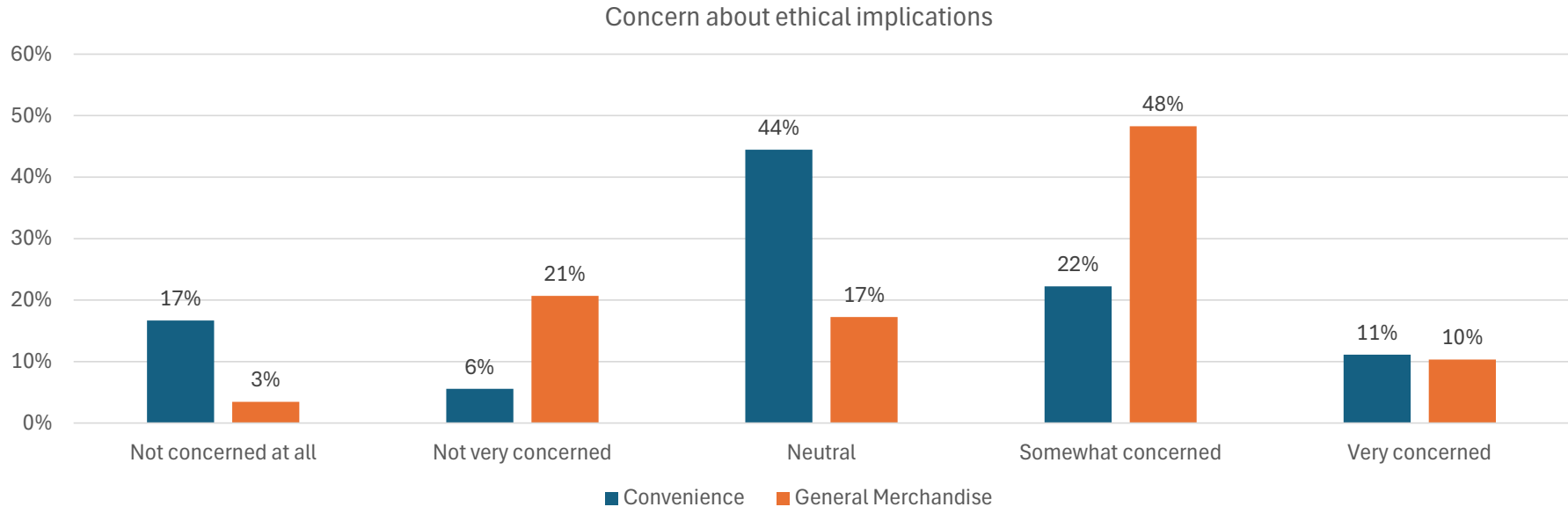
- Convenience had more challenges with identifying suitable use case and software not performing as advertised. The expected lack of skilled personnel did not occur.
- General merchandise had lower expectations for suitable use cases and software not performing and they did not occur.

Both retailers believe the three biggest challenges to adoption are cost of implementation, readiness of AI solutions and lack of knowledge and skills.*



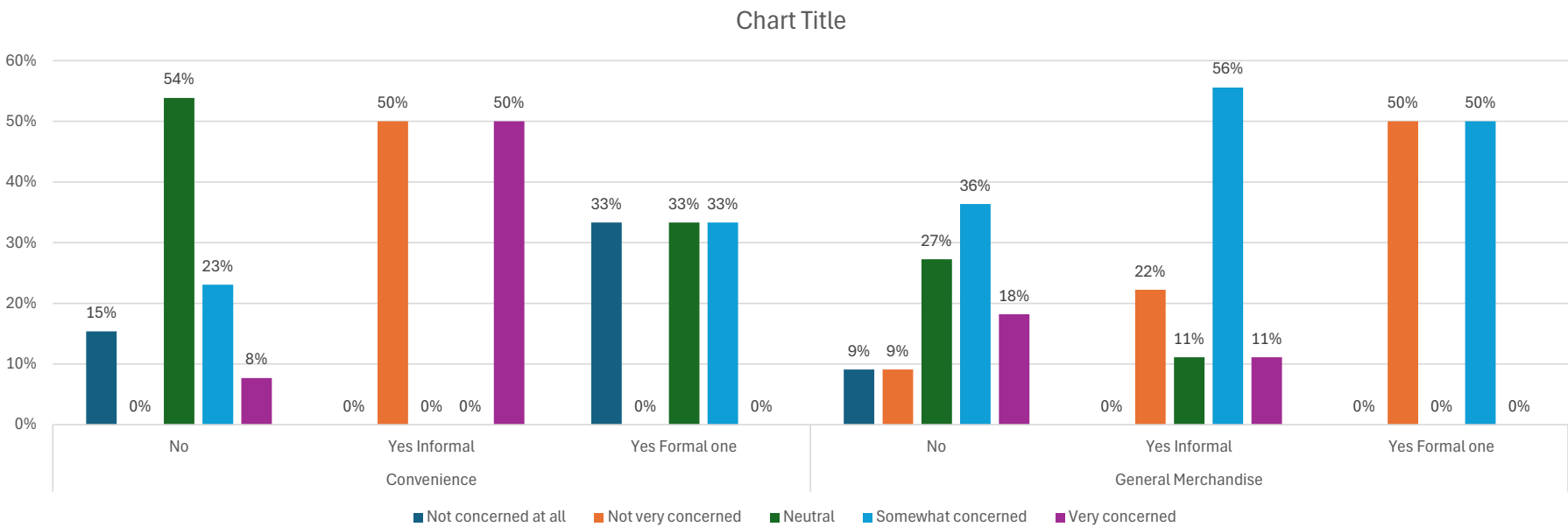
Ethical concerns and regulations

General merchandise has more who are somewhat or very concerned combined.

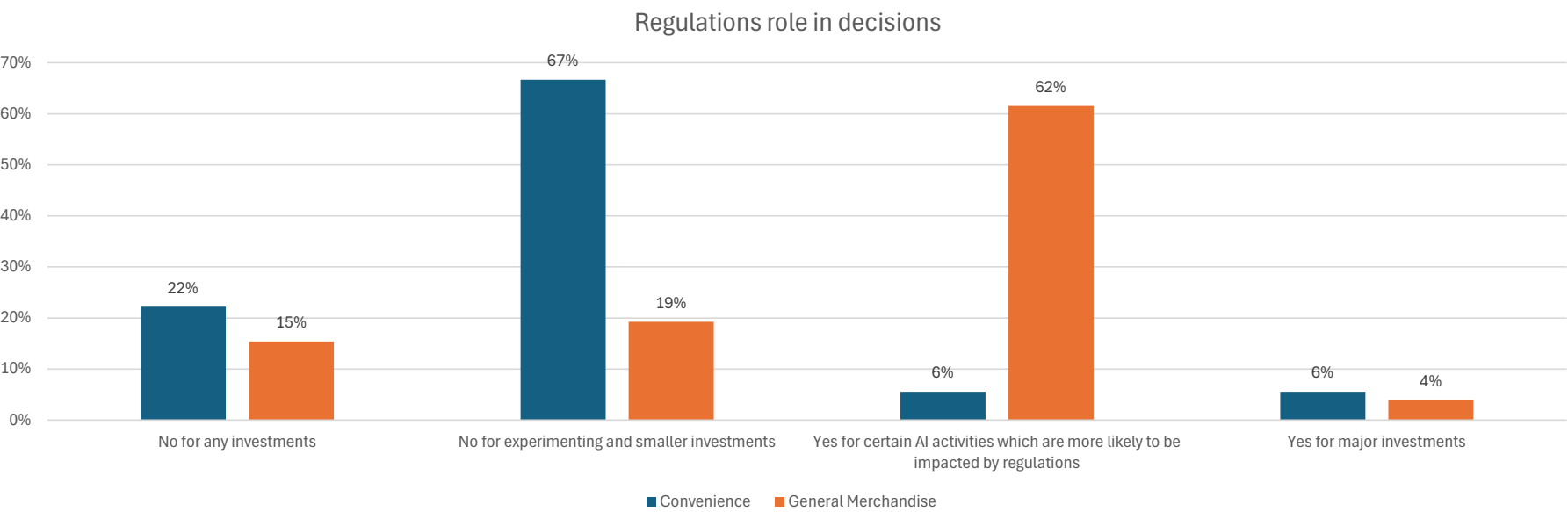


Thirty-three percent of convenience retailers are somewhat or very concerned. Fifty-eight percent of general merchandise retailers are somewhat or very concerned. This difference may be due to the type of applications being utilized.

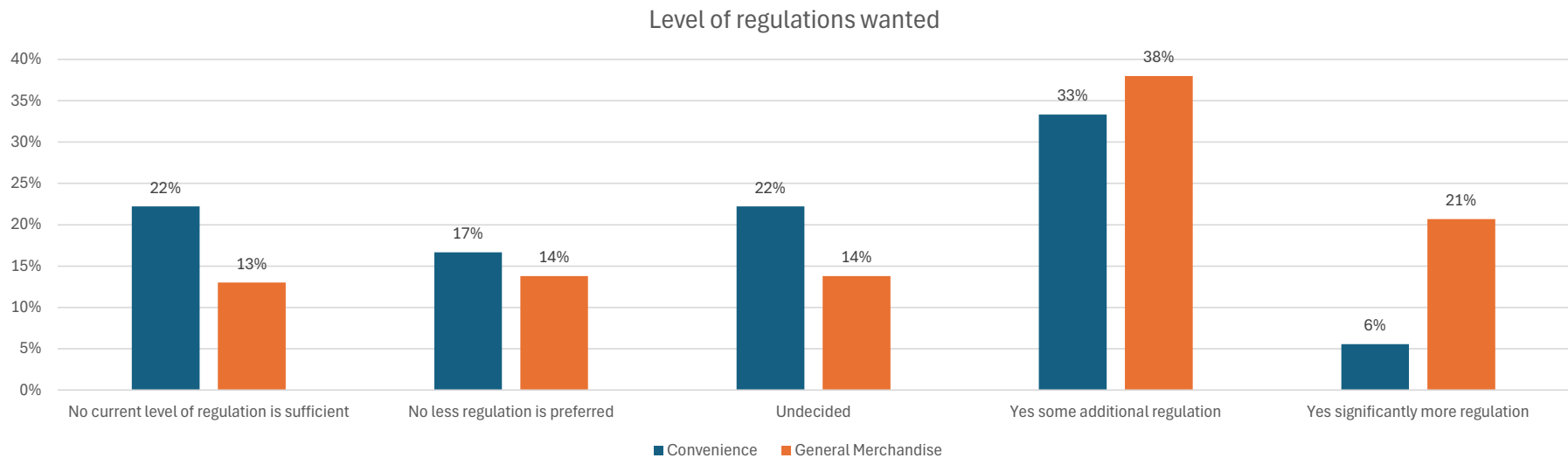
AI policy vs concerns – As concerns increase the retailers are slightly more likely to have some type of policy.



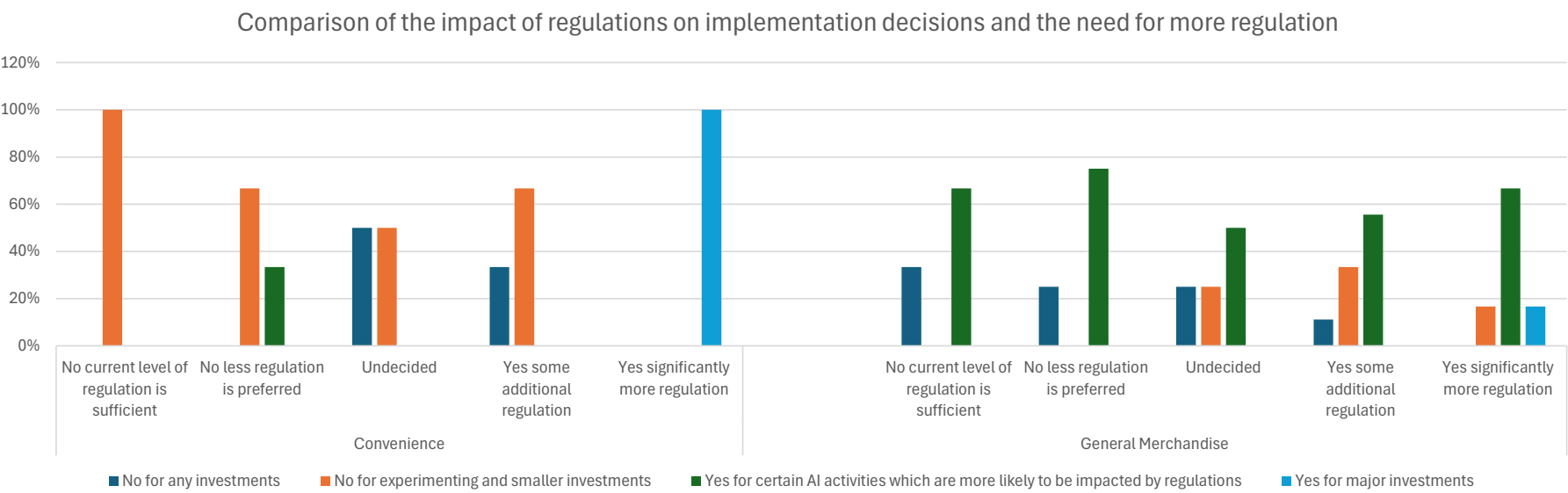
Role of Regulations in decisions is considered for larger investments or where there is concern that there may be regulations in that area in the future.



More government regulations is preferred by general merchandise with fifty-nine percent compared to thirty-nine percent of convenience

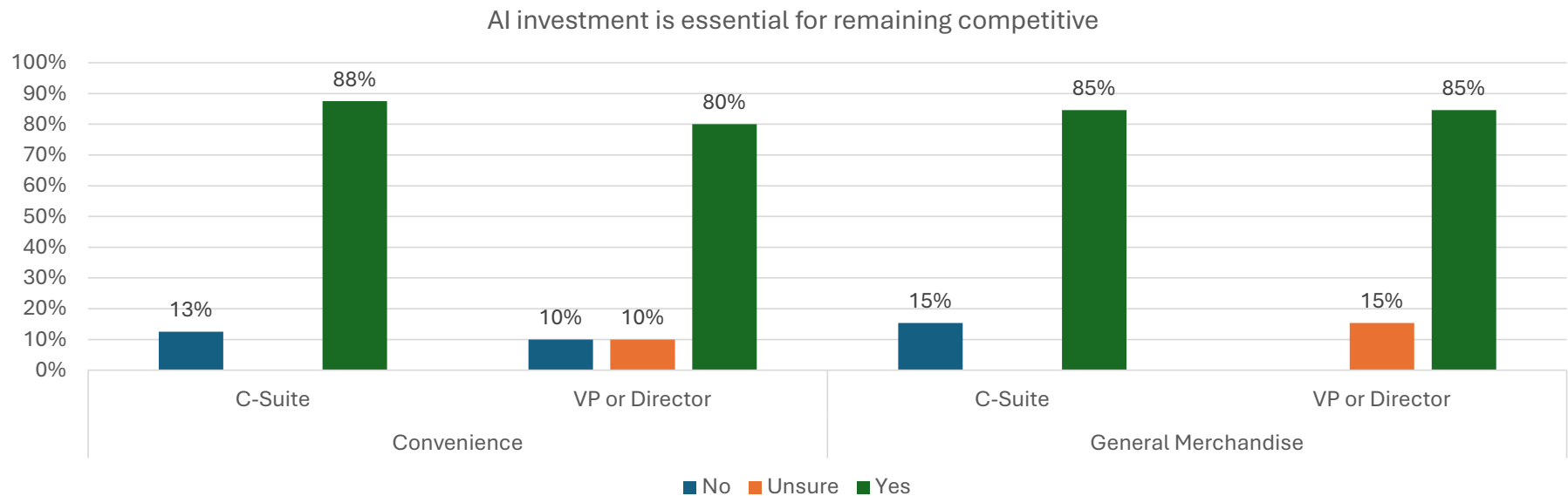


Companies consider regulations as a factor in deciding to implement AI. Generally, companies prefer less regulation.

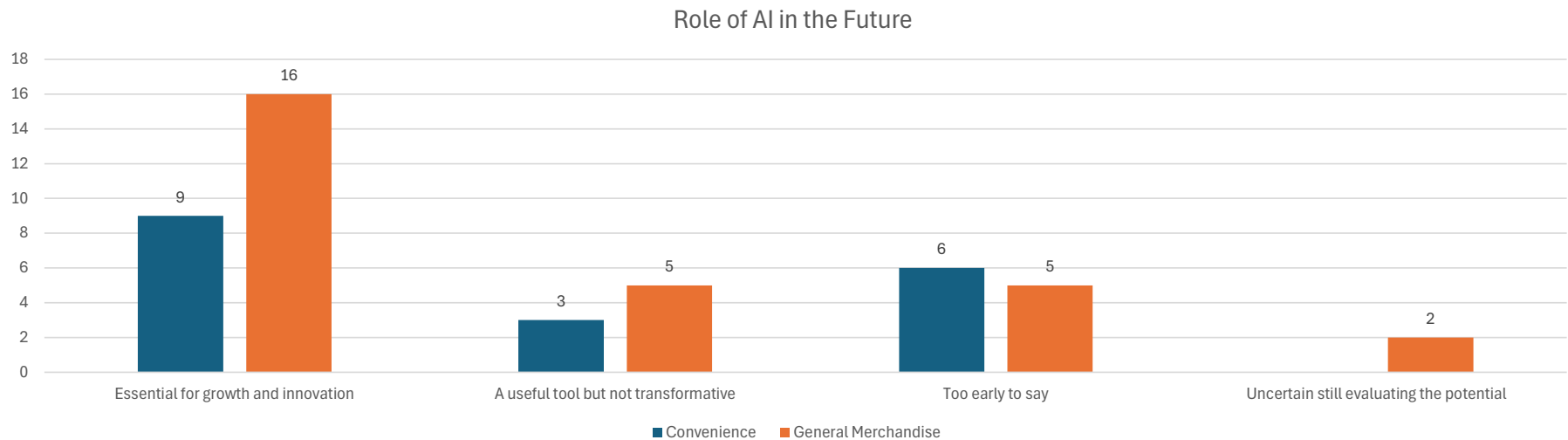


Views on the Role of AI in Retail

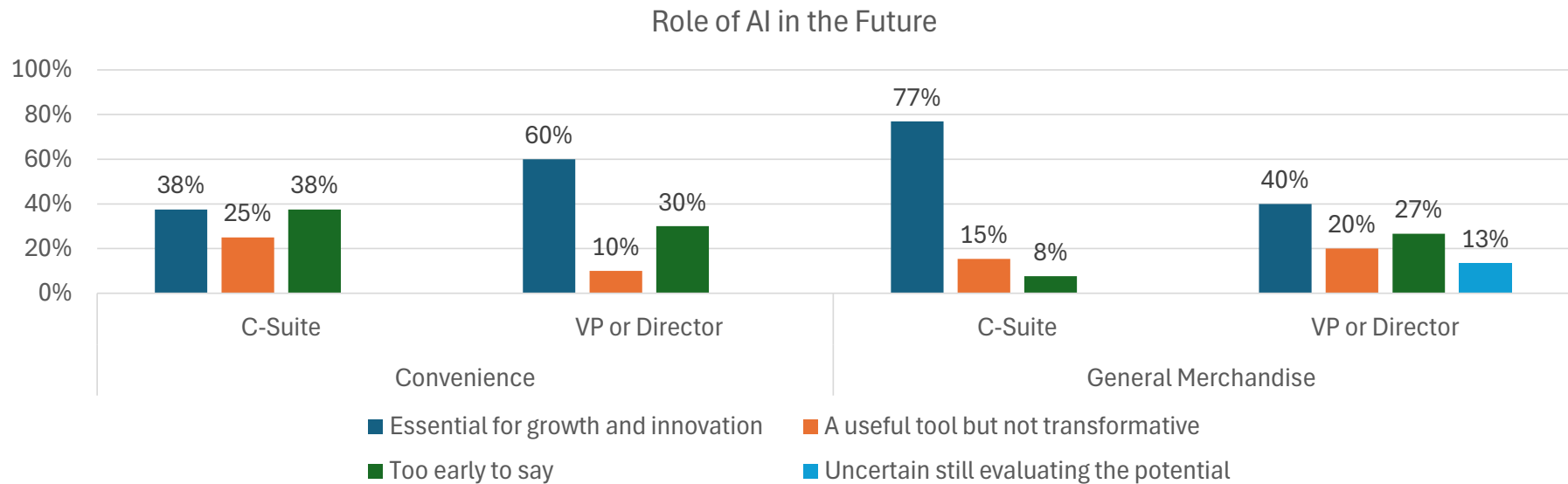
The C-Suite in both types of retailers believe AI is essential to remain competitive. VP and Directors are not quite as sure.



More retailers believe AI is essential for growth and innovation but not necessarily transformative.



The C-Suite in general merchandise believes AI is essential for growth and innovation. The C-Suite in convenience has a more balanced view of the future of AI



- The VP and Directors are more positive on it being essential for growth and innovation in convenience.
- In general merchandise they are more balanced in their view

Closing

Closing remarks

- AI in Retail is in the very early stages of adoption and usage for both convenience and general merchandise.
- Like most innovative technologies there is a fair amount of hype versus reality today which can be seen in the small number of companies who have implemented AI
- It has potential based on this limited survey but there are challenges to overcome to achieve the potential benefits
- Whether it develops into a robust component of the Retail Industry will depend on continued development and experimentation as has been the case for any prior innovative technology.
- The tools will need to be trained on the retailer's data to achieve its potential.
- Both types of retailers could benefit from an exchange of information to help achieve the benefits and robust implementations

The Convenience Technology Vision Group (CTVG) brings together convenience technology leaders for quarterly virtual meetings. The group addresses trends, challenges and disruptions and solutions in AI, computer vision, alternative payments, robotics, IoT, blockchain, cybersecurity, data analysis, EVs, food tech, frictionless checkout, digital experiences, workforce management and more. The group is committed to sharing its views and perspectives to advance the convenience retailing and mobility industry. CTVG operates under the Vision Group Network, which gathers the collective knowledge and ideas of its members to create a legacy of sharing within the retail community. For more information and to sign up for future Vision Reports, visit our website: vgnsharing.com/vision-report-library



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