

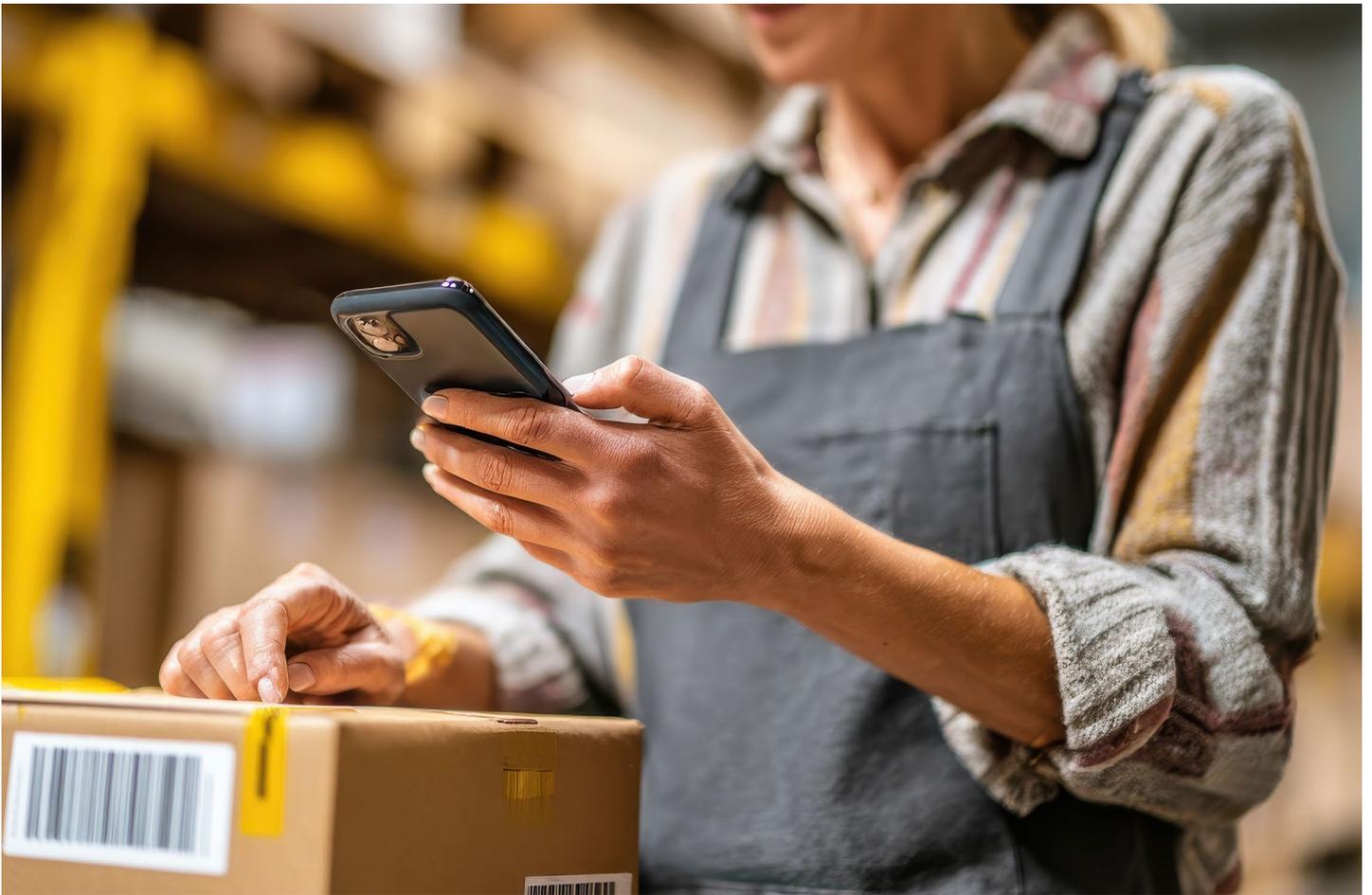
THE FUTURE OF SUPPLY CHAIN DATA CAPTURE

From Barcodes to Vision Intelligence

EXECUTIVE SUMMARY

Supply chains are evolving faster than ever before. Consumer expectations are rising, and businesses are under pressure to deliver speed, accuracy, and transparency simultaneously. For decades, barcodes have formed the backbone of operational visibility, enabling companies to track inventory, manage orders, and maintain control over complex flows of goods. However, as global supply chains grow more intricate, traditional barcode scanning alone can no longer meet the demands of modern operations.

Emerging technologies, such as vision intelligence, are transforming the very concept of data capture. These technologies extend far beyond simple scanning—they allow systems to interpret information, verify conditions, and even predict future outcomes. This evolution signals a shift in supply chain management, where data capture is no longer a passive activity but an active enabler of intelligence and agility.



THE CURRENT STATE OF DATA CAPTURE

The role of barcode scanning in supply chains cannot be understated. Over the past forty years, barcodes have created unprecedented visibility into inventory, shipments, and order fulfillment. According to Supply Chain Management Review, more than 70% of supply chain managers cite inventory visibility as a critical challenge [SCMR, 2024]. This statistic illustrates that, while barcodes have provided a foundation for operational oversight, visibility gaps persist, particularly as supply chains become more global and dynamic.

Simultaneously, workforce challenges exacerbate operational risk. High turnover in warehouses, often exceeding 40% annually [Material Handling & Logistics, 2023], introduces variability and potential errors into routine workflows. While traditional scanning systems help mitigate some risks, they cannot detect human error, predict issues, or offer automated verification. This combination of visibility and labor challenges highlights the need for a new generation of data capture technologies.

THE EMERGENCE OF VISION INTELLIGENCE

While AI interprets data, computer vision enables systems to “see” the environment and act on it. Vision-enabled technology extends capabilities beyond traditional barcodes, allowing systems to recognize objects, assess product conditions, and verify the correctness of tasks. For instance, in a warehouse setting, computer vision can confirm that items are placed in the correct locations or detect damaged packages before they leave the facility.

The integration of computer vision into supply chains marks a shift from reactive to proactive operations. Rather than identifying issues after the fact, vision systems enable real-time verification and

automated exception handling. Industry forecasts indicate that combining AI with computer vision in supply chain contexts will be a primary driver of efficiency and risk reduction in the next decade. By embedding these technologies into data capture workflows, organizations can significantly improve accuracy, reduce returns, and enhance customer trust.

MULTI-PLATFORM INTEGRATION

The future of supply chain data capture is inherently multi-modal. Companies are no longer limited to traditional handheld scanners. Data capture now occurs across mobile phones, tablets, wearable devices, kiosks, and rugged industrial hardware. Integrating vision intelligence capabilities across these platforms ensures consistency and reliability, regardless of where and how scanning occurs.

This integration also allows organizations to adapt to workforce dynamics. Seasonal or temporary staff can quickly be equipped with mobile devices that provide automated verification, reducing training time and error rates. Cloud-based analytics consolidate data from multiple devices and sites, providing enterprise-wide visibility and actionable insights. The combination of flexible hardware and intelligent software represents a paradigm shift, allowing businesses to scale operations without compromising accuracy or control.

STRATEGIC IMPLICATIONS

The implications vision intelligence enabled data capture extend across organizational levels. For executives, these technologies provide a path to operational efficiency, cost reduction, and enhanced customer service. Decision-makers can respond more quickly to market fluctuations, optimize resource allocation, and anticipate potential disruptions before they escalate.

For operations leaders, intelligent data capture streamlines workflows and improves accuracy. By embedding automated verification, real-time alerts, and predictive insights into everyday processes, organizations can reduce errors, improve throughput, and maintain consistency across multiple facilities. Developers and IT teams also benefit from the flexibility of multi-platform systems, enabling rapid deployment, seamless integration, and future-proof scalability.

INDUSTRY TRENDS AND ADOPTION

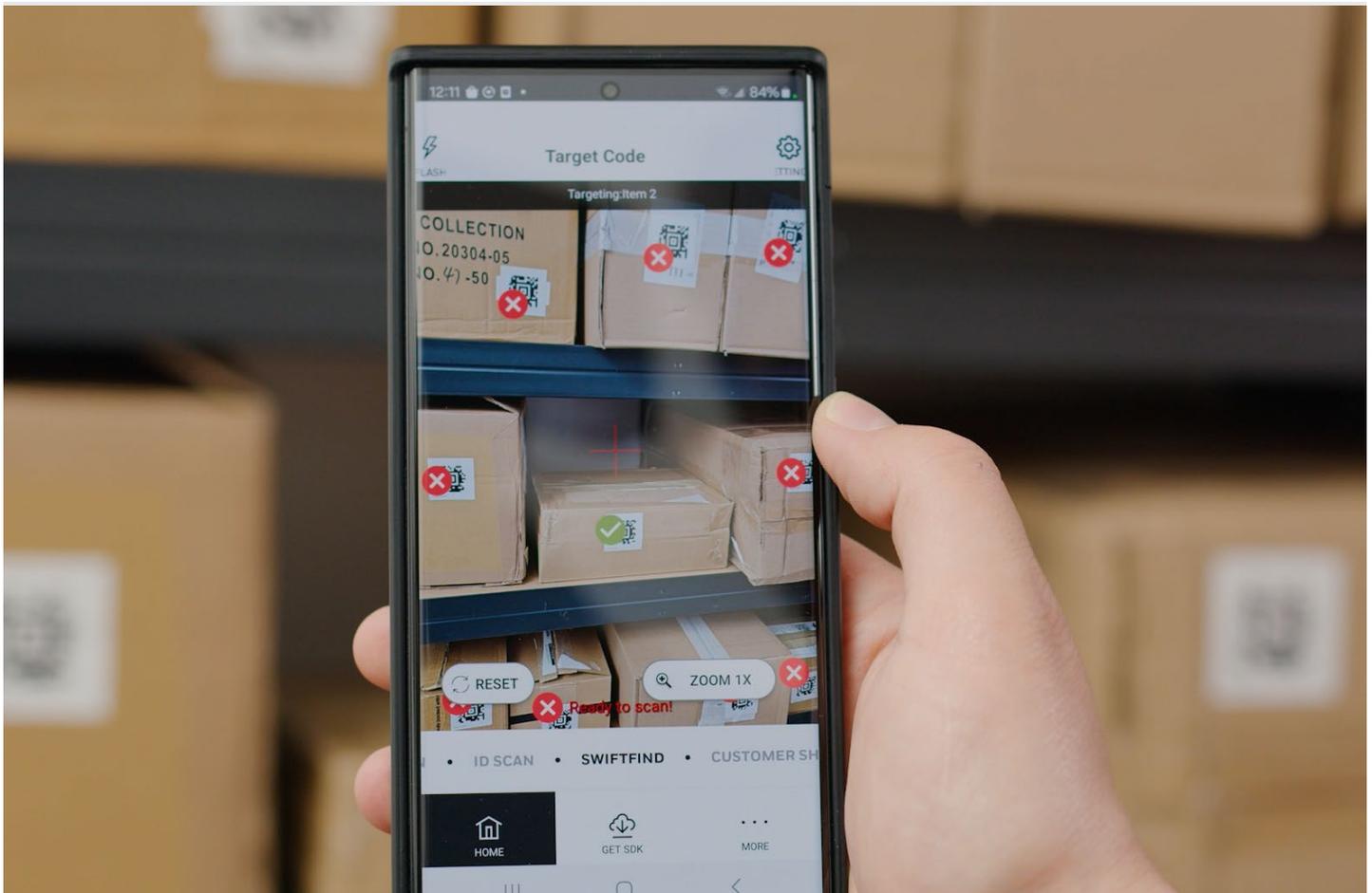
Several trends highlight the rapid evolution of supply chain data capture. Hybrid systems that combine barcode scanning, AI, and vision intelligence are emerging as the new standard. Predictive analytics is increasingly used to anticipate demand, optimize inventory, and reduce downtime. Cloud-based platforms centralize and standardize data from multiple sources, enabling real-time visibility and enterprise-wide insights.

Furthermore, workforce enablement is becoming a key differentiator. Tools that provide intelligent guidance, verification, and automated error detection empower employees to perform more efficiently, reducing the impact of high turnover and labor shortages. As companies invest in these technologies, early adopters are gaining measurable advantages in speed, accuracy, and operational resilience.

CONCLUSION

The future of supply chain data capture extends far beyond traditional barcodes. By integrating AI and computer vision into multi-platform systems, organizations can move from reactive processes to proactive, intelligent operations. These technologies provide not only enhanced visibility and accuracy but also predictive insight and automated verification, enabling faster, more agile decision-making.

Companies that embrace this evolution will be better equipped to meet rising consumer expectations, respond to disruptions, and maintain competitiveness in an increasingly complex global landscape. The shift from simple scanning to intelligent, vision-enabled platforms represents a transformative opportunity for supply chains worldwide—a future where data capture is no longer a passive function, but a strategic enabler of operational excellence.



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For more information

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