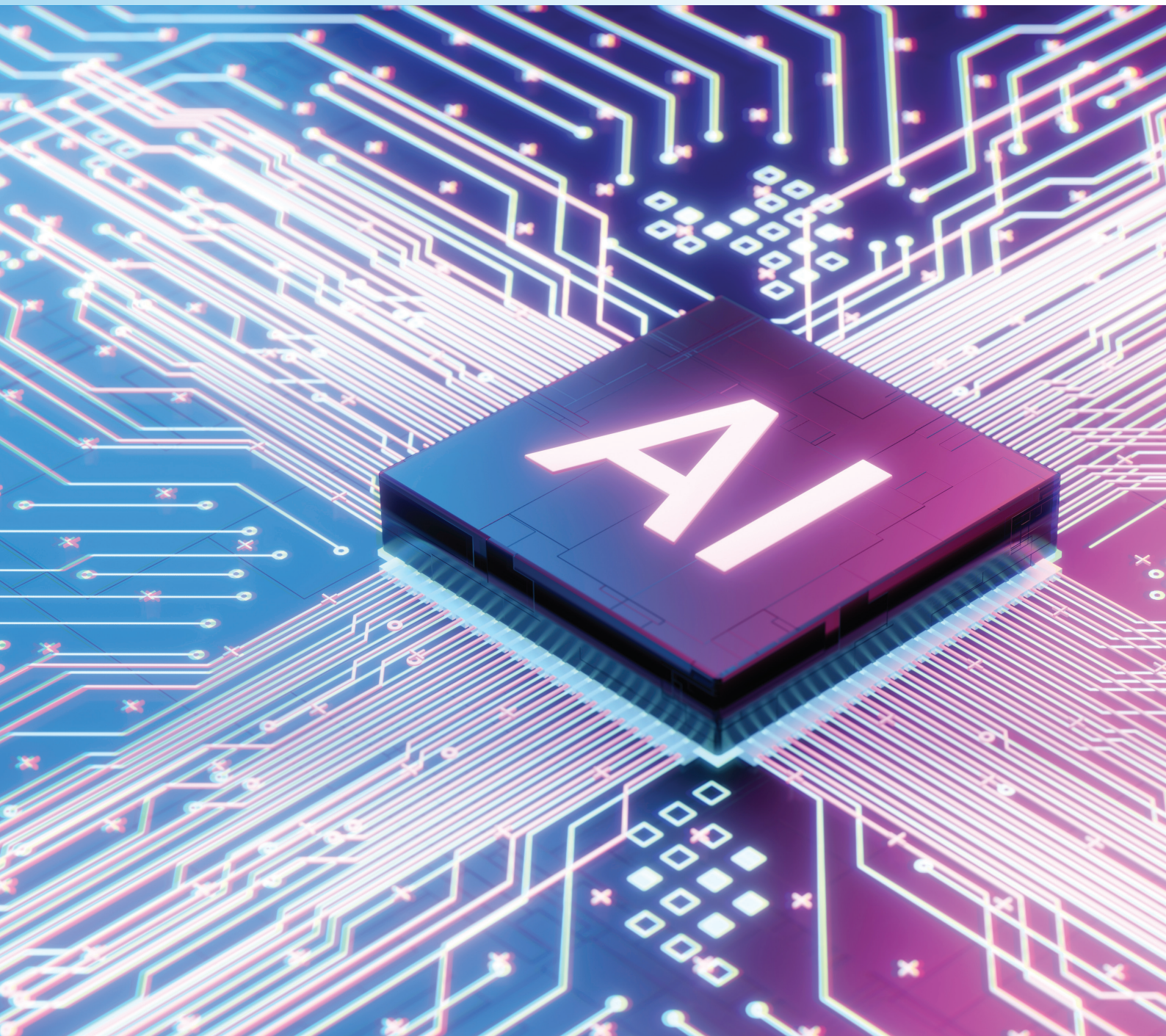




The Global Language of Business

The core relevance of trusted identification and data in an AI-driven world

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AI is reshaping everything

Artificial intelligence (AI) is reshaping the way industries engage consumers and patients, comply with regulations, optimise their supply chains and bring products to market efficiently. For companies producing, moving and selling goods, AI promises unprecedented speed, personalisation and efficiency. Yet, its power depends on one critical factor: the quality and trustworthiness of the data it consumes. At this crossroads of consumer engagement, regulatory compliance and AI disruption, GS1's role as a global standards organisation becomes more vital than ever for the industries that we serve.

GS1 has always been committed to creating a common language for business. Fifty years ago, the barcode transformed the way products were identified, giving us speed, accuracy and efficiency at checkout. Today, we are carrying that same spirit of innovation into an AI-driven world.

Artificial intelligence is only as good as the data it consumes. Trusted identification and interoperable, machine-readable standards are the foundation that will allow AI systems to deliver accurate, meaningful and safe results. Without common identifiers, shared vocabularies and reliable data carriers, AI risks amplifying noise or misinforming critical decisions instead of unlocking knowledge.

This is why GS1 is evolving alongside industry—to ensure that the digital future is built on trust, on interoperability and on the same collaborative spirit that made the barcode universal. Let's step back and look at the global landscape of change through three different lenses: Consumer Engagement, Regulatory Compliance at Scale and the Package as the Platform.

“AI systems perform best when grounded in structured, verifiable and interoperable data. Industry standards for trusted identification such as those from GS1 support a more reliable foundation for AI to deliver safe, meaningful and scalable outcomes across sectors.”

— Yorke E. Rhoades III,
Director, Strategy & Transformation | Traceability,
Microsoft

Consumer engagement

Consumers expect brands and retailers to anticipate their needs, provide instant answers and build trust through authenticity. AI enables this always-on engagement, but it is only as reliable as the product data behind it. A poorly structured or inconsistent dataset will misinform consumers, undermining brand trust.

By anchoring every product in a unique, globally recognised identity, use of the GS1 system enables AI systems to deliver the right information at the right time. For example, a language model connected to GS1-verified data can provide a consumer with accurate recycling instructions in one interaction, product recall alerts in another and loyalty rewards in a third. The consumer sees seamless intelligence, while the brand benefits from increased trust and loyalty.

GS1 standards create the connective tissue that allows brands and retailers to leverage AI to engage consumers responsibly, ensuring that personalisation does not come at the expense of accuracy or safety.

Regulatory compliance at scale

Regulation is driving much of the urgency for smarter data exchange. Governments worldwide are mandating greater transparency around product safety, environmental impact and supply chain traceability. Compliance is no longer confined to back-end documentation—it increasingly “lives on the package.”

AI accelerates both the challenge and the solution. Regulators are beginning to use AI tools to detect fraud, validate sustainability claims and monitor market behaviour in real time. Companies, in turn, must ensure that the data they expose to these systems is both accurate and machine-readable. GS1 provides the global frameworks to make this possible: a trusted system of identifiers and vocabularies that regulators can rely upon for interoperability across borders and industries.

Without common standards, AI's ability to monitor compliance would devolve into inconsistency and error. With GS1 standards, regulators and companies can leverage a shared data foundation that ensures transparency, speed and trust.

The package as the platform

Traditionally, packaging was a container—primarily a vehicle for branding, marketing and distribution. In today's digital economy, packaging has become the entry point to commerce, compliance and consumer trust. A simple scan of a QR code powered by GS1 can unlock layers of information: origin, safety certifications, recycling instructions, loyalty rewards or regulatory data while also enabling physical store operations and customer checkout scanning.

This shift elevates the package into a digital platform that mediates between brands, regulators, retailers and consumers. By enabling one code to serve many purposes, GS1 standards ensure that packaging is not fragmented by proprietary systems or redundant identifiers. In an AI-driven future, where natural language models retrieve information at scale, having a single interoperable language of product identity and trusted data is essential to prevent misinformation and fragmentation.

GS1's role is to be a foundational layer of truth and interoperability for AI in global and connected commerce by focusing on ensuring that AI systems, from the largest LLMs to the smallest startup solutions, can rely on GS1 standards, trusted identification and trusted data published by brands and retailers using GS1 standards and services. The common thread is that AI can thrive if it can access high-quality, standardised data.

“The new paradigms of agentic commerce will require increased trust in every step that is taken on the consumer's behalf. Standards like those from GS1 are critical to identify products and ground the models.”

— Fabrice Caillette,
Sr. Director of Engineering for Google Commerce, Google





The future of trusted identification and trusted data in an AI-driven world

In an increasingly AI-driven future, we see a completely new stack of solutions emerging, from LLMs to almost limitless layers and applications being re-imagined to do everything; from searching the web to agentic AI to new coding platforms and new ways of managing and integrating data. AI development platforms and AI-based applications will all benefit, over time, from the maturing of the foundational layer of LLMs (particularly as companies use the whole stack to create new efficiencies and opportunities).

For the decades of industry investment in GS1 standards and data to play a role into this future, standards, data models and registries of trusted data should be understood, recognised and leveraged by AI systems. There are a number of opportunities to leverage standards, trusted identification and trusted data that are emerging in the LLM space:

Using trusted data: Retrieval-Augmented Generation (RAG)

To mitigate this, industry is turning to Retrieval-Augmented Generation (RAG), a method that leverages trusted external data sources as grounding for AI responses. This is a unique opportunity for GS1: Serving as an authoritative global source of product identity and related data, GS1 can help to ensure that the data retrieved by AI systems is correct, up to date and interoperable. Yet the role of GS1 in AI extends well beyond RAG. Other AI paradigms depend equally on external trusted datasets, and GS1 is positioned to play a critical role in each.

Ongoing training of models: fine-tuning and continual learning

When models are fine-tuned for specific industries—such as healthcare, food safety or logistics—they require high-quality, structured and bias-free training data. GS1 datasets can act as a “reference standard,” ensuring that models learn from authoritative product data rather than noisy or conflicting sources. This reduces hallucination risk and strengthens AI’s reliability in safety-critical contexts.

Grouping things correctly: embedding models and semantic search

AI relies on defined semantics, clustering and recommendations. GS1 identifiers and data models can provide anchor points that align data with real-world products. This ensures that a search for “similar yogurt products” returns only items that are truly equivalent, rather than approximations based on text similarity alone. Embedding models grounded in GS1 data standards make search and recommendation systems far more precise.

Maps of relationships between things: knowledge graphs

GS1 identifiers and data expressed using the GS1 Web Vocabulary can form a global product knowledge graph, enabling AI to reason over structured relationships. Instead of treating data as isolated text, knowledge graphs let AI connect a product to its manufacturer, certifications, recall history and recycling instructions. Graph-based AI is far more explainable than black-box models, and GS1 can help to ensure the integrity of the graphs that underpin this reasoning.

Helping AI to verify data: trust and verification through Verifiable Credentials

Perhaps the most important frontier is trust. AI models are increasingly called on to provide advice in regulated sectors, where misinformation can have severe consequences. By integrating verifiable product claims—origin, allergens, sustainability certifications—into GS1-standards-backed data systems, AI outputs can be verified against trusted credentials. This helps AI to prove the provenance of what it says, not just generate plausible-sounding answers from unknown sources.

GS1’s value is not limited to RAG but extends across training, grounding, reasoning and verification. In each case, GS1 can provide the truth anchor that makes AI usable in sensitive commercial and regulatory contexts.

The opportunity for Industry and for GS1

Promoting trust in data

It's critical that Brands consider the dynamic landscape to ensure that they're navigating toward a future where they publish data that can be consumed by everyone with trust. GS1 is a partner to industry, and we should start preparing our engagement with the AI ecosystem, considering how we will need to position the value of trusted identification and trusted data. We should also consider that the relevance of trusted identification and trusted data will go far beyond the LLMs of the world, to include ERP and PIM systems, AI Agents and more.

Preventing the cost of fragmentation

The risks of fragmentation are real. If every industry, region or company develops its own closed system for product data, AI models will drown in conflicting or incomplete information. This would slow adoption, increase compliance costs, erode consumer trust and potentially impact consumer or patient safety outcomes.

GS1's open standards model and global registries of identity work together to avoid this outcome. By aligning industry, regulators and technology providers around a single interoperable framework, GS1 helps industry to reduce costs, simplify compliance, build trust and unlock accelerated innovation.

The cost of fragmentation is replaced by the benefits of collaboration: a shared platform of standards, a simple vocabulary and industry-sourced datasets that the entire ecosystem can rely on. To make meaningful progress, GS1 will partner with industry in ways that are strategically aligned with their most critical business needs and will do so in an aligned way across the GS1 federation, reducing fragmentation of messaging and accelerating progress.

Digital trade acceleration

The AI revolution is not occurring in isolation; it intersects with broader transformations in digital trade and sustainability. Nations are modernising trade rules, mandating electronic documentation and advancing circular economy models. For these efforts to succeed, stakeholders require consistent identifiers and data languages that can flow seamlessly across borders.

Industry associations serve as accelerators, and they can and should depend on GS1's system of standards and data services to function as the backbone. GS1's relevance lies in ensuring that AI-driven data flows are not just fast but also trusted, transparent and globally scalable.

“AI can enhance consumer engagement and safety, but only when it is grounded in reliable and verifiable product data. GS1 standards and ecosystem play an important role in supporting that foundation consistently across global markets.”

— Jean-Marc Klopfenstein,
Strategic Industry Data Stewardship, Nestlé

In an AI-driven world, data is the currency of engagement, collaboration and compliance. Proof of data provenance, quality and integrity is the currency of trust. But raw data is not enough—only structured, interoperable and high-quality data can unlock AI's full potential. GS1's foundations of trusted identification and trusted data, as well as the interoperable industry solutions built on top of these foundations, sit at the heart of this transformation, providing the identifiers, standards and trust frameworks that can help to ensure AI delivers value to consumers, regulators and businesses alike.

- Companies of all sizes should use GS1 standards and registries for identifying things and for describing things, wherever and whenever data (including claims and certifications) is being created or published about products, locations or assets.
- Industry should partner with GS1 around the world to proactively engage with AI companies, raising awareness of the importance and power of GS1 standards, data models and foundational registries.
- Solution providers of all sizes should consider leveraging GS1 standards and connection to registries in their own offerings, particularly when those offers relate to the creation or sharing of data.

As industries navigate the intersection of consumer engagement, regulatory compliance and AI disruption, GS1's mission has never been more relevant. It is not merely about barcodes, standards or any one specific industry use case. It is about enabling a digital future where AI serves humanity with accuracy, integrity and trust—and where the industries that GS1 serves can most effectively benefit.

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