Q&A

## Brand & CMO Partnerships

# Top Answers for Strengthening Serialization Collaborations

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Life Sciences Cloud

**S**erialization ensures that drug products can move through the supply chain safely and securely by minimizing the risk of drug counterfeiting, diversion, and fraud. With contract manufacturers and packagers handling large volumes of product, their readiness for serialization is critical to the industry's overall success.

If you're a CMO preparing for serialization, you are facing costly packaging line and equipment upgrades, country compliance requirements, artwork changes, custom interfaces, and unique data and choreography requirements from your brand owner customers. The digitization of the supply network is a massive challenge, but it's also a massive opportunity that could open the door to new business efficiencies and opportunities.

If you're a brand owner, you must be ready to address how the regulatory model, data, and transactions will vary by country, and how that impacts both internal and external manufacturing resources. And while many brands are tempted to handle internal resources first, coordinating your network of external resources is typically a much more involved and time-consuming undertaking.

To help you prepare for the onslaught of readiness activities, we asked both brand owners and CMOs to submit their top questions on how to best work together towards serialization. If you're a brand or CMO looking for answers from industry experts on how to adopt the right cost model, serial number strategy, or Level 4 implementation, then this guide is for you. Read on to find out the top 16 queries of your peers, plus answers from TraceLink experts.

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# The Cost of Serialization and Who Pays

Implementing serialization is expensive:  the price can be hundreds of thousands of dollars to upgrade each packaging line. Determining who pays for CMO line upgrades is one key reason why the progress of both pharma companies and CMOs sometimes stalls. What are the different scenarios the industry is considering?

## Question 1: How should the CMO and brand owner determine who pays for the serialization of packing lines?

**Answer:** The CMO incurs significant cost in upgrading packaging lines, implementing process changes, and upgrading the necessary serialization software to meet the requirements of their brand customers. Whether the CMO absorbs these costs or reaches a commercial agreement with brands is an issue for the two companies to decide. While there is certainly no standard approach, CMOs typically charge a small fee per serialized unit.

Upgrades are estimated at $250,000 to $500,000 per line, which means that some contract partners are looking for brand owner assistance, while others have decided that upgrading lines offers a distinct competitive advantage because it positions them as the first serialization-enabled CMOs. The most common models for these commercial agreements include:

- **Capital cost:** The CMO asks for upfront payment to help offset the cost of the initial capital outlay.

- **Integration fee:** Similar to capital cost, where CMO charges a fee to integrate per line upgrade.

- **Per-serial-number fee:** CMO covers the cost of line upgrades, but brand pays a certain amount per serialized data once they are in manufacturing or production mode. There is a challenge for the CMO in paying for the initial investment, but this model ensures that they're going to get paid back for their investment.

- **Contract price:** CMO provides the brand with packaging at a certain price, requiring CMO to adhere to all government regulations for any given market where the brand has a contract. Cost is covered by that existing contract, and there is no incremental commercial agreement that allows the CMO to recoup the cost of upgrade.

- **First in line, first to pay:** If you're the first brand owner on a particular line, then you are required to pay for the upgrades because you're the first customer to ask for that retrofit of those capabilities.

## Question 2: As a CMO, will I be able to spread the cost of retrofitting packaging lines, thereby spreading the spend across multiple customers?

**Answer:** Sharing the cost is a very common model, although there is no clear answer in the industry right now as to how this should be handled. The shared-cost approach allows the CMO to bring all customers they work with to the table to determine what share of the packaging production capability each brand uses on a particular line. If a brand is using 30% of the capacity, they may be asked to pay for 30% of the cost to upgrade the physical line itself. Ultimately, this model depends on the peer relationship between brands and the CMOs they're working with.

## Question 3: Is there a tax deduction for the CMO to get compliant, similar to how CMOs had a compliance deduction for Americans with Disabilities Act (ADA) years ago?

**Answer:** We are not aware of any such program. We did investigate with the Pharma & Biopharma Outsourcing Association (PBOA), a non-profit CMO association in Washington, D.C., but were not able to confirm any such program. Nor have we heard of such a program with the many CMOs with whom we have engaged.

# Bearing the Responsibility for Generating Serial Numbers

Most brands will generate their own serial numbers. Some small companies, virtual brands, and smaller government agencies may have CMOs generate serial numbers. A CMO should always ask each brand customer how they want to handle this, as each company should have a documented strategy.

## Question 4: Who should be generating serial numbers: the brand owner or CMO?

**Answer:** There are three common scenarios for how serial numbers are generated and managed:

- **The brand owner generates serial numbers and distributes to the CMO.**
  By far, the most common process is for the brand owner to generate and distribute serial numbers to CMOs that are authorized to manufacture and package particular products in geographies with a regulatory requirement. Most brand owners will accept serial number requests from authorized CMOs and return a serial number response containing a list of serial numbers.

- **The CMO generates serial numbers on behalf of the brand owner.** A small number of large brands are distributing algorithms or number ranges for CMOs to generate the serial numbers, but this is not common. There are, however, some solutions used by certain brands where the serial numbers are pushed to the CMO after they've been generated.

- **The CMO generates serial numbers for virtual brand owners, with inventory then managed by the virtual company.** Virtual pharmaceutical companies may potentially look to their CMO to generate serial numbers. Even in the virtual segment, though, there are strong compliance and trade requirement reasons for brands to manage their own inventory of serial numbers.

## Question 5: Are companies preparing to exchange serialization data for DSCSA the same way they're doing now for lot-level compliance?

**Answer:** No. Unlike the use of EDI 856 ASN to exchange lot-level T3 data, the focus for serialization data exchange has been on the use of GS1 EPCIS data exchange methods. Industry stakeholders from across the supply chain have been working on completing the next version of the GS1 Implementation Guideline for DSCSA, providing a standardized

foundation for the exchange of serialization information, aggregation data, and serialized product inquiries.

Once the serialization phase of DSCSA begins, a dual path of data exchange is expected across the industry, using EDI ASN to send lot-level T3 compliance data, and GS1 EPCIS for serialization data.
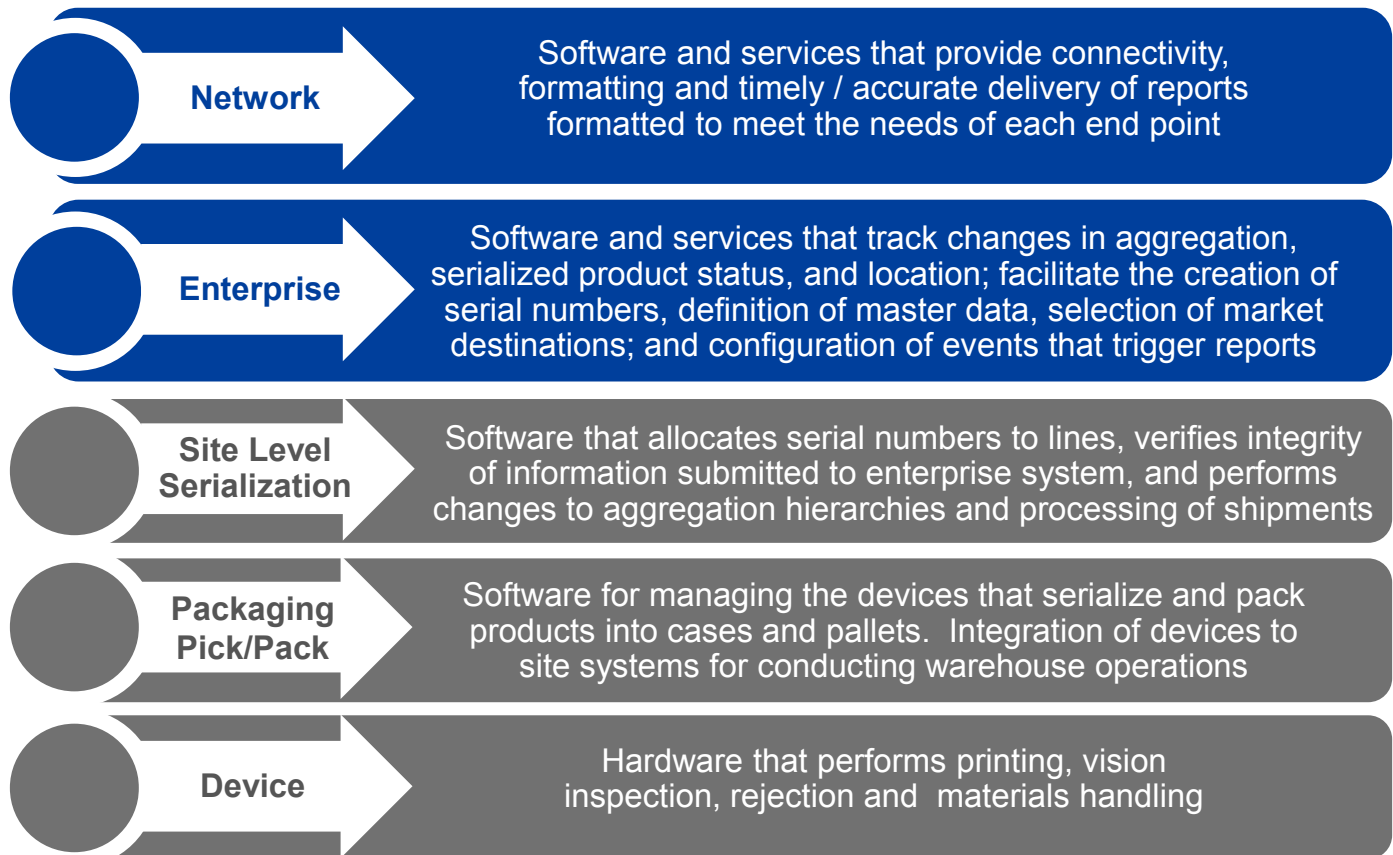
# Managing Serialization Level 4 and Level 5 System Integration

The purpose of having a global serialization and track and trace enterprise system, commonly referred to as "Level 4," and a network system, or "Level 5," is to enable management of all serialization and regulatory data and business processes throughout the enterprise and beyond to partners, customers, and regulatory authorities. Leveraging interconnectivity and interoperability at every level of the stack (Levels 1 - 5) is important because the decisions you make today can impact the operational performance between CMOs, brand manufacturers, and brand trading partners.

**Question 6: As a CMO with Levels 1 - 3, do I really need a Level 4 or Level 5 system, or can I completely rely on the brand owner or my packaging line vendor for these capabilities?**

**Answer:** First, let's look at the five levels in the serialized packaging framework.

## Serialization Framework

| Level | Description |
|---|---|
| **Network** | Software and services that provide connectivity, formatting and timely / accurate delivery of reports formatted to meet the needs of each end point |
| **Enterprise** | Software and services that track changes in aggregation, serialized product status, and location; facilitate the creation of serial numbers, definition of master data, selection of market destinations; and configuration of events that trigger reports |
| **Site Level Serialization** | Software that allocates serial numbers to lines, verifies integrity of information submitted to enterprise system, and performs changes to aggregation hierarchies and processing of shipments |
| **Packaging Pick/Pack** | Software for managing the devices that serialize and pack products into cases and pallets.  Integration of devices to site systems for conducting warehouse operations |
| **Device** | Hardware that performs printing, vision inspection, rejection and  materials handling |

Level 1-3 systems are provided by line management system (LMS) vendors. They receive a lot of focus due to the application and verification of serialized packaging, but a Level 4 system is essential to managing and verifying the data that must accompany each serial number. Level 2 and Level 3 systems provide capabilities at the packaging line and packaging site level, respectively, but if you're a CMO, you should consider Level 4 and Level 5 system capabilities in the following scenarios:

- **You perform serialization at multiple locations.** A Level 4 can serve as the enterprise repository and management system across CMO sites. Brands prefer dealing with multi-site CMOs as a single enterprise rather than as a collection of sites, and by implementing data management through Level 4 integration points, you offer better operational performance to your customers.

  Level 4 also allows you to manage your serialized inventory after it leaves the line. So, for any necessary rework or changes, you do not need to go back to the line to make those changes. Using the line to make changes takes up time that could be used to manufacture and package more products.

- **Your brand owner requires you to generate and verify serial numbers.** LMS vendors (Level 1-3) don't have repositories to retain previously commissioned serial numbers for the required regulatory data retention period (for example, 12 years in the U.S.). Some will purge all records associated with the previous batch upon line changeover for the next batch, while others will purge upon shipment or shortly thereafter. Since the LMS isn't storing this data, there's no ability to check for duplicates against previously commissioned serial numbers from prior batches.

  Having a Level 4 system enables you to store all previously commissioned serial numbers in an active available state so you can immediately verify numbers upon commission. Having this layer of visibility ensures that no duplicates exist from previous batches, thereby protecting you against significant compliance risk.

- **You work with more than one brand owner.** LMS vendors provide the capability for their Level 3 to connect to a single Level 4. But Level 3 systems do not have the routing capability to connect to multiple Level 4 systems, so working with multiple brand owners requires a Level 4-Level 5 solution.

- **Your brand owner has different file formats, sequencing, and choreography.** Even if your Level 3 could connect to multiple Level 4 systems, it most likely supports a simple interface, such as the GS1 "standard events." In practice, two-thirds of the top 50 brand owners require custom CMO integration interfaces. LMS vendors do not have the knowledge or experience to support these complex integrations. They could build custom integrations, but who will pay for the development and support of the solution? Will the LMS vendor commit to supporting changes in every brand owner's interface in a timely manner and at no extra cost?

- **Your brand owner expects you to package for multiple countries that require serialization.** If you need to address serialization across multiple markets, a more robust Level 4 serialization management capability supporting continuous global compliance may be required.

- **Your brand owner expects you to send serialized shipment information.** Customer ship-to information isn't typically available in Level 2 and 3 systems, so many brand owners require you to produce shipment messages about serialized product. You must then send these messages back to the brand owner, to a third-party distribution partner, or both.

- **Your brand owner requires you to handle unique exceptions or multiple scenarios.** For certain products, you may need to address additional considerations, such as:

  » Generating serial numbers for the brand owner.
  » Accepting pre-serialized labels from a third-party label converter.
  » Providing certain event triggers that are required by regulatory guidelines (for example, pre-commission authorization).

Having a system with Level 4 capabilities is the best way to address each of these complexities.

Many forward-thinking CMOs are treating serialization as an opportunity to gain market share. CMOs that can respond rapidly to quickly evolving regulatory requirements will be well-positioned to take on new business. By having Level 4 and Level 5 system capabilities, you can offer your brand customers the competitive advantage of meeting all their regulatory compliance needs with the most flexibility.

# Question 7: Is it common for CMOs to already have enterprise-level systems?

**Answer:** No, not according to our experience. Most CMOs have not implemented a full-blown enterprise-level or data exchange serialization capability for the following reasons:

- **Their priority was at the packaging line.** Due to the short timelines and the complexity of implementation for line-level systems to support serialized product packaging, serialization, and aggregation data management, to date, the primary focus for many CMOs has been on just getting the packaging lines retrofitted (Level 1-3).

- **Their experience was on the packaging line, not on IT systems.** Prior to regulatory serialization requirements, each batch of drug product had identical labeling. But serialization creates the need to apply variable data in order to make each package unique. Doing so requires IT systems to integrate directly with packaging lines, which introduces unfamiliar technology to most packaging teams.

- **They postponed focusing on data requirements.** Until recently, serialization activities at many CMOs focused primarily on print/apply/inspect packaging-line piloting, and not data management and data exchange requirements. As brand owners began implementing their own enterprise management systems for serialization, CMOs started to understand how they need to manage data aspects for their own operational success. In addition, many CMOs focused on the data requirements from the first brand owner that came on board, which means that a lot of systems have been built to handle one requirement rather than all requirements.

  The challenges of these data requirements exposed the need for an enterprise system with capabilities beyond those provided by Levels 1-3.

- **The focus was on just the product.** Realizing that each serialized product that is shipping now also requires an accompanying "shipment of data" has expanded attention to the Level 4 systems that need to be in place for a CMO to securely and accurately manage each customer's data, often with varying requirements.

- **The global complexity wasn't fully understood.** Serialization goes far beyond simply printing bar codes on a package. Global requirements vary from country to country, and multiple bi-directional regulatory events may need to be initiated, captured, or provided to a CMO. In these situations, a Level 4 system will reliably manage these requirements, and a Level 5 enables secure and accurate data exchange at the correct event trigger across multiple sites and brand owners, many of whom will have different expectations and processes at hand.

# The Implications of Aggregation

While aggregation has the potential to create efficiencies across the entire supply chain, it also adds significant cost to the packaging process. For anyone downstream of the product manufacturer, the ability to infer contents based on the identity of a larger container is advantageous for receiving, put away, inventory management, and pick, pack, and ship procedures.

But while wholesale distributors and other downstream trading partners see most of the benefits, the cost burden for initiating aggregation falls on manufacturers, making many reluctant.

Some CMOs may make independent decisions about whether to enable aggregation on their lines, while others are working closely with their brand owners to decide. Either way, it's a hot topic that partners need to discuss now.

**Question 8: What are the main advantages of using aggregation, even when it is not required?**

**Answer:** While DSCSA doesn't require it, aggregation has been highlighted as a growing trade requirement in the U.S., and the laws in other global markets such as India and Turkey do require it.

Aggregation is expensive to implement, but it does offer certain advantages to a brand owner:

- **Reconciliation** - Provides an efficient reconciliation tool where it's easy to identify deviation, and, consequently, batch closure is much faster.
- **Site management** - Improves the operational efficiency in managing serialized product in internal distribution sites.
- **3PL distribution** - Can be implemented if a brand owner works with a 3PL for initial distribution, which may be necessary given the complexity of managing serialized products and verification procedures.

# Managing the Logistics of Implementation

CMOs and pharma companies have questions about the flexibility of implementation, including how and when to begin, and also about how serialization will ultimately impact ongoing operations in the business-as-usual world.

**Question 9: Regardless of regulations, do you think that CMOs can start serialization implementation a bit down the line? For example, could you start with the cardboard-case packaging step, and then move upward to the cartoning serialization later on?**

**Answer:** CMOs are balancing dozens of different customers, and each one comes with not just diverse regulatory requirements, but with different business and operational demands. Deciding when line upgrades should begin, and agreeing on financial responsibility, will take months. In order to meet these unprecedented demands, there are models for starting with manual approaches to serialization before implementing fully automated solutions. There are also some options to use label converters as part of an initial approach, or for certain markets.

The biggest question facing the CMO is how to minimize the amount of change, reduce the number of implementation phases, and shorten the overall time to completion. Implementing serialization in multiple steps, while potentially less costly and complex to design in the initial phases, creates added risk and complexity in the long run, with each implementation change at the line requiring new validation steps, new blocks of packaging down time, and new modifications to the data integrations with the enterprise serialization system. If CMOs cannot produce serialized product when the deadlines arrive, they will not be able to produce compliant — and saleable — product for their brand owners.

**Question 10: Our pharmaceutical company is speaking with project leads, but once the project is finished and we are live in business-as-usual mode, who owns the serialization efforts when we enter a new market or the laws change?**

**Answer:** Most large pharma companies have established a multi-functional global serialization team to set the initial plan and to implement the early regulatory markets. At some point, these teams transfer the responsibility back to the respective units for business-as-usual operation. These units will be responsible for managing any regulatory changes — and necessary communication with CMO partners — subsequent to this transition. This is one reason why knowledge transfer is so crucial during the business-as-usual phase.

## Question 11: Is there a preferred tamper-evident solution?

**Answer:** Since packaging presentation and target markets are highly variable, it's hard to say if there is a preferred solution for detecting and preventing package tampering. Specific regulations cover requirements for tamper-evident packaging in certain markets. The Falsified Medicines Directive in the EU, for example, has specifications for equipping drug products with tamper-evident features as part of the 2019 regulations.

# Working with TraceLink

The TraceLink model simplifies communications between CMOs, brands, and trading partners, offering plug-and-play integration to ensure continuous compliance with global serialization and traceability standards and requirements.

### Question 12: How does TraceLink work with GS1 to incorporate their standards?

**Answer:** TraceLink works closely with GS1 in both leadership roles and as elected members. Our executives help shape standards development, driving strategic discussions with pharma companies and other supply chain members that face significant infrastructure and operational challenges in meeting global serialization and traceability deadlines. TraceLink has deep experience and a successful track record in commercial deployments with GS1 EPCIS with leading pharmaceutical companies and wholesale distributors for global product traceability.

As a GS1 member, TraceLink actively participates in multiple global serialization workgroups. Our subject matter experts have co-authored and contributed heavily to several GS1 Implementation Guidelines, including the Brazil Guideline, the original U.S. Drug Pedigree Messaging Standard (DPMS), and the forthcoming Implementation Guideline for DSCSA.

### Question 13: How does TraceLink enable serial number issuance and management?

**Answer:** TraceLink enables complete serialization management between the brand owner and the CMO, including:

- Capturing serial number requests from the LMS.
- Generating serial numbers according to the required formats for the intended market.
- Provisioning serial numbers back to the LMS and monitoring their usage.

Based on the infrastructure and preferences of the brand owner and the CMO, TraceLink can provide any or all of these.

### Question 14: If a CMO is integrated with a brand owner's ERP for production order and batch release, are the serial numbers managed in the integrated interfaces, or do you just integrate at the TraceLink level?

**Answer:** TraceLink launched an ePedigree compliance solution, delivering end-to-end track and trace capabilities for states like California, Florida, and Nevada, all the way back in 2005. Ensuring drug supply throughout the supply chain at the state level helped blaze the track and trace trail by setting the course for how DSCSA would later work at the federal level. One of the lessons we learned from California ePedigree (2005 – 2009) was determining where to manage serialization data. The original model was to integrate serialization data inside the ERP or warehouse management system (WMS), while today, virtually every company manages serialization data separately from these systems but with the necessary integration points.

Serialization data is typically exchanged directly between the CMO's systems and TraceLink. The integration interfaces developed by the TraceLink platform were specifically designed to manage the massive data exchange volumes and highly interactive, time-sensitive transaction exchanges of the serialization connection between brand owner and CMO.

From serialization request/response, commissioning and aggregation events, shipment events, and exception management, serialization creates a highly complex set of new data exchange requirements. Traditional, order-oriented data connections simply are not designed for the capacity, the responsiveness, and the formatting required, which is why TraceLink designed a purpose-built serialization interface to meet these unique needs. To make things even simpler, we've developed and tested over a dozen off-the-shelf integrations to all leading serialization LMS vendors, making the CMO process as plug and play as possible.

## Question 15: How should a CMO consider goods that are stored at the depository but belong to the brand owner? Is it possible for the CMO to connect to TraceLink to deactivate (decommission) the serial numbers on behalf of their customer, or does the brand owner have to deactivate them?

**Answer:** TraceLink provides an integrated connection to the CMO, enabling them to trigger a deactivation (decommissioning) event. When a deactivation event occurs at a CMO site, the brand owner's serialization repository is automatically updated with the deactivation status for the affected serial numbers.

## Question 16: What is the serialization cost model for serialization systems, including setup for CMOs, onboarding, and licensing fees for data exchange?

**Answer:** TraceLink has modeled its CMO pricing to reflect the nature of a CMO's business so that much of the cost only occurs once the CMO is in production. Similarly, some of the LMS vendors have programs in place to defer the costs of packaging-line upgrades.

To learn more about TraceLink serialization solutions, <u>contact us</u>.

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