The Global Language of Business

Case Study

Golden State Foods

Delivering Visibility with a Side of Innovation

Challenge

As one of the largest diversified suppliers to the foodservice industry, Golden State Foods values providing the highest quality products as well as delivering the last mile to some of the world's most iconic brands. Servicing approximately 125,000+ restaurants in more than 50 countries on five continents with predictable reliability requires going the extra mile. Delivering value through the seamless fusion of data and standards enables a more automated digital experience for every participant in the supply chain.

Solution

Focusing on the freshness of its products, Golden State Foods engaged in a proof-of-concept, and then a pilot, focusing on RAIN RFID* – a solution that uses radio waves and cloud-based infrastructure to capture, manage, and connect RFID data to the Internet – powered by GS1 Standards. The proof-of-concept unlocked value with the ability to track, trace, and monitor case level end-to-end visibility by sharing digital product data with trading partners in a hands-free, automated manner. The follow-up pilot aimed to scale up implementation of the technology using the second-generation GS1 Tag Data Standard (TDS), without impacting operational speed.

Benefit

- **End-to-End Traceability:** By using RFID powered by GS1 Standards, Golden State Foods has enabled the tracking and monitoring of product freshness and inventory levels for not only itself, but for all downstream supply chain trading partners.
- **Keeping with Speed:** Maintaining line speed while adding flexibility in encoding traceability data, enhancing the precision of traceability and optimizing shelf-life management.

* What is RAIN RFID?

Radio frequency identification or RFID is a technology that enables the sharing of data encoded in RFID tags via RFID scanners. The term RAIN RIFD specifies use of the UHF frequency band, which leverages the GS1 air interface protocol to communicate with tags.

GS1 refers to "RAIN RFID" tags in this document whenever making reference to UHF RFID tags. NOTE: Within the UHF RFID technology space, GS1 only endorses RAIN RFID implementations that are encoded per GS1's EPC standards (which is a subset of all RAIN RFID implementations).

Behind the Sizzle

Ordering a hamburger at a fast-food restaurant sounds simple – the patty gets cooked, the buns are prepared with savory sauces, toppings like pickles and lettuce complete the ensemble, and minutes later you can still taste the sizzle. But when you zoom out and think of the billions of consumers placing that same order and the millions of pounds of food being used to serve them – the importance of getting each ingredient needed to fill each order at the right place, at the right time, gets amplified.

This is why Golden State Foods prides itself on superior quality, innovation, and customer service. Each year it produces billions of hamburger patties and other food products for its customers. This includes the capacity to produce more than 400,000 hamburger patties each hour, or the equivalent of nearly 200 million pounds annually.

With additional product lines for liquid products, dairy products, and produce items, Golden State Foods knows that the best way to fill an order is by following its values. When one of its major customers launched an initiative to share digital data across the supply chain, Golden State Foods was already in collaboration with key supply chain stakeholders trying out new digital technologies. The company sought to create a recipe for success where automation and end-to-end visibility contributed just the right amount of spice for a new solution blend.

A New Recipe for Success

Crisp lettuce, juicy tomatoes, cool cucumbers - the right mix of ingredients brought together can create a delicious experience. Similarly, by bringing together the right combination of ingredients, Golden State Foods was able to execute a proof-of-concept to digitally track cases of beef patties along their journey from when they are made, distributed, and received at their final destination.

The first ingredient was leveraging work they had already done. This included implementing GS1 Standards like the Global Trade Item Number® (GTIN®) and Global Location Number (GLN) to help track Critical Tracking Events (CTEs) and Key Data Elements (KDEs).

The second ingredient was bringing together the best partners to get rapid results. To accomplish this, Golden State Foods also included its own manufacturing facility and distribution center – along with leveraging its owner/operator relationships.

The third – and most critical ingredient – was applying RFID tags. Looking to track at the case level, but in a fast and efficient process, RFID tags enabled by the GS1 Electronic Product Code (EPC) Standard, included product information related to the GTIN, production date and serial number. The tagged cases were able to be scanned without line-of-sight needed, a huge advantage for efficiency.

Exceeding expectations, Golden State Foods was able to not only track and monitor the freshness of the beef patties, but the pilot awakened the company to the art of the possible. It demonstrated how the convergence of standards, thought leadership, and IoT technologies unlocked the potential to optimize inventory, improve product case rotation, and enhance shelf-life management.

FIGURE 1
Bit Breakdown of Tag Encoding (128 bits)

Header	+AIDC[1] Indicator	Filter Value	Date Indicator	Date Value	GTIN	Encoding Indicator	Length Indicator	Serial Number
DSGTIN+ 1111 1011	None 0	2 - Case 010	Production Date 0000	230522 0010 1110 1011 0110	09520001999994 0000 1001 0101 0010 0000 0000 0000 0001 1001 1001 1001 1001 1001 0100	4-bit 0-9 A-F 001	8 0 1000	ABCD1234 1010 1011 1100 1101 0001 0010 0011 0100

FB202EB60952000199999428ABCD1234

- The first eight bits represent the DSGTIN+ (Date-Prioritized Serialized GTIN) encoding scheme, which tells you this is a product, and you can expect a GTIN* (Global Trade Item Number*), date, and serial number, at minimum.
- The next field indicates if additional attribute data (AIDC indicator) is included.
- The filter value identifies the packaging level. In the example of the Golden State Foods pilot, it identifies the case.
- The date indicator tells you that this example uses a production date, and the date value is used to capture the actual date.
- The GTIN indicates the unique product identifier.
- The last three describe the serial number: data type (encoding indicator), length, and serial number value.

[1] Automatic Identification and Data Capture

The First Byte

What Golden State Foods accomplished wasn't just a benefit for its customers and supply chain, but also an innovation for the entire foodservice industry. Historically, the foodservice industry has been using GS1-128 barcodes, encoded with GTINs, on cases and scanning them with hand-held devices. Because it doesn't require line-of-sight, tagging cases with RFID offers immense benefits of efficiency benefits. However, the industry was hesitant. RFID is encoded with a serialized GTIN – a SGTIN-96 – while the GS1-128 barcode does not. This disparity between a non-serialized GTIN and serialized GTIN appearing on a single case has long been a point of contention.

Recent updates to the GS1 Tag Data Standard (TDS) tackle this challenge, and Golden State Foods was one of the first to test it in this proof-of-concept and subsequent pilot. The TDS was updated in 2022 to optimize the tag data structure for perishable goods. Simply put, the TDS is like the description of an item on a menu – explaining what is included and any additional information pertinent to the item.

The Taste Test

Like any good recipe, it needs to get tasted – tested – and refined. Collaborating with its corrugate manufacturer, chip manufacturer, tag provider and tag reader provider, Golden State Foods was able to move the tag placement upstream to the corrugate process. By successfully streamlining tag placement at the source, the "pre-tagged" corrugate provided Golden State Foods the opportunity to make the recipe more palatable to suppliers.

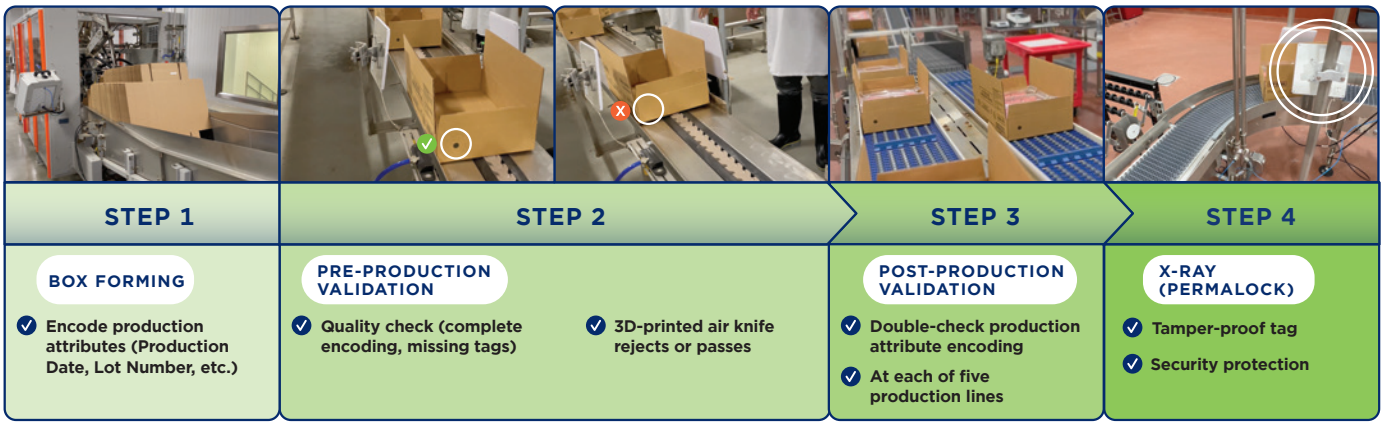
To validate those attributes, improve the traceability of the patties and to test the ability for trading partners to access the data, Golden State Foods launched a pilot at its Opelika, Alabama manufacturing facility. For Opelika operations, the production date is the lot level information. By adding this additional ingredient, the company proved that partial encoding in real-time was plausible. After the date value was encoded onto the pre-tagged corrugate RFID label, it was locked to prevent any further code changes.

While this would be an important step to increase the precision of its end-to-end supply chain tracking, as it achieved in its earlier proof-of-concept, the added steps could not impact operations or slow the speed of the line. Also, to keep costs the same, Golden State Foods didn't want to change to high-memory RFID tags.

For this pilot, Golden State Foods started at the beginning of the line – incorporating steps for automatic verification and validation of proper encoding – all the way to post-production. After post-production, the tag would be perma-locked to prevent any tampering.

Out of the cases that were measured in the pilot, 100 percent of them had their production dates successfully set and tags perma-locked. Through this work, Golden State Foods was also able to discover best practices that led to its automated validation checks, allowing for more flexibility with encoding traceability data on the line with no impact to speed.

FIGURE 2
Tasting the Performance



Sharing the Secret Sauce

Grounded in its values, Golden State Foods is excited to share its findings and help the foodservice industry move ahead with RFID.

Golden State Foods credits GS1 Standards, including the second-generation TDS with helping to power RFID.

"TDS 2 is like the icing on the cake. It's not the main ingredient but it's an integral part toward the desired outcome. It allows the suppliers to encode production attributes that are critical to establish food provenance. The combination of pre-tagged corrugate and TDS 2 allow us to capture critical production data during manufacturing without incurring additional labor hours. To accomplish this without impacting operations and while maintaining the speed of the production lines, is truly a differentiator," according to Guilda Javaheri, chief technology officer at Golden State Foods.

For others in foodservice looking to get started with RFID, Golden State Foods recommends collaborating with stakeholders across the industry. A pinch of insight you get from here and the dash of expertise you get from there makes a world of difference in finding new ways to leverage technology for the greater good of all participants in the food chain.

Finding inspiration from one of her favorite African proverbs, you'll often hear Javaheri sharing this saying with others, "If you want to go fast, go alone. If you want to go far, go together."

About the Organizations

About Golden State Foods

Golden State Foods is one of the largest diversified suppliers to the foodservice industry. Headquartered in Irvine, California, the multi-national company is values-based with proven performance in superior quality, innovation and customer service. Established in 1947, GSF currently services 200+ leading brands (125,000+ restaurants/stores) from its 50 locations on five continents. Its core businesses include: processing and distribution of liquid products, protein, produce, dairy and other services. The company employs approximately 6,000 associates and is 100 percent management-owned and run. Golden State Foods also operates a national non-profit organization, the GSF Foundation. www.goldenstatefoods.com

About GS1 US

GS1 US®, a member of GS1® global, is a not-for-profit information standards organization that facilitates industry collaboration to help improve supply chain visibility and efficiency through the use of GS1 Standards, the most widely used supply chain standards system in the world. Nearly 300,000 businesses in 25 industries rely on GS1 US for trading-partner collaboration that optimizes their supply chains, drives cost performance and revenue growth while also enabling regulatory compliance. They achieve these benefits through solutions based on GS1 global unique numbering and identification systems, barcodes, Electronic Product Code-based RFID, data synchronization, and electronic information exchange. GS1 US also manages the United Nations Standard Products and Services Code® (UNSPSC®). www.gs1us.org

Important Disclaimer

The use of all GS1 Standards are voluntary and not mandatory. GS1 US is making this information available to be used for educational purposes only.

Each company is individually responsible for meeting all statutory and/or regulatory requirements for their company and their products. Consult with your company's legal counsel or compliance team (regulatory or quality) for more specific information about current statutory and regulatory requirements applicable to your company and products.

Proprietary Statement

This document contains proprietary information of GS1 US. Such proprietary information may not be changed for use with any other parties for any other purpose without the expressed written permission of GS1 US.

Improvements

Improvements and changes are periodically made to publications by GS1 US. All material is subject to change without notice. Please refer to GS1 US website for the most current publication available.

Disclaimer

Except as may be otherwise indicated in specific documents within this publication, you are authorized to view documents within this publication, subject to the following:

1. You agree to retain all copyright and other proprietary notices on every copy you make.

2. Some documents may contain other proprietary notices and copyright information relating to that document. You agree that GS1 US has not conferred by implication, estoppels, or otherwise any license or right under any patent, trademark, or copyright (except as expressly provided above) of GS1 US or of any third party.

This publication is provided "as is" without warranty of any kind, either express or implied, including, but not limited to, the implied warranties of merchantability,

fitness for a particular purpose, or non-infringement. Any GS1 US publication may include technical inaccuracies or typographical errors. GS1 US assumes no responsibility for and disclaims all liability for any errors or omissions in this publication or in other documents which are referred to within or linked to this publication. Some jurisdictions do not allow the exclusion of implied warranties, so the above exclusion may not apply to you.

Several products and company names mentioned herein may be trademarks and/or registered trademarks of their respective companies. GS1 US does not, by promulgating this document on behalf of the parties involved in the creation of this document, represent that any methods, products, and/or systems discussed or recommended in the document do not violate the intellectual property rights of any third party. GS1 US has not performed a search to determine what intellectual property may be infringed by an implementation of any strategies or suggestions included in this document. GS1 US hereby disclaims any liability for any party's infringement of intellectual property rights that arise as a result of any implementation of strategies or suggestions included in this document.

This publication may be distributed internationally and may contain references to GS1 US products, programs, and services that have not been announced in your country. These references do not imply that GS1 US intends to announce such products, programs, or services in your country.

GS1 US shall not be liable for any consequential, special, indirect, incidental, liquidated, exemplary, or punitive damages of any kind or nature whatsoever, or any lost income or profits, under any theory of liability, arising out of the use of this publication or any content herein, even if advised of the possibility of such loss or damage or if such loss or damage could have been reasonably foreseen.

GS1 US HEREBY DISCLAIMS, AND YOU HEREBY EXPRESSLY RELEASE GS1 US FROM, ANY AND ALL LIABILITY RELATING TO YOUR COMPLIANCE WITH REGULATORY STANDARDS AND LAWS, INCLUDING ALL RULES AND REGULATIONS PROMULGATED THEREUNDER. GS1 US MAKES NO WARRANTIES OF ANY KIND RELATING TO THE SUITABILITY OF THE GS1 STANDARDS AND THE SPECIFIC DOCUMENTS WITHIN THIS PUBLICATION TO COMPLY WITH ANY REGULATORY STANDARDS, LAWS, RULES AND REGULATIONS. ALL INFORMATION AND SERVICES ARE PROVIDED "AS IS."

*GS1 US employees are not representatives or agents of the U.S. FDA, and the content of this publication has not been reviewed, approved, or authorized by the U.S. FDA. The following information contained herein is for informational purposes only as a convenience and is not legal advice or a substitute for legal counsel. GS1 US Inc. assumes no liability for the use or interpretation of the information contained herein.

No Liability for Consequential Damage

In no event shall GS1 US or anyone else involved in the creation, production, or delivery of the accompanying documentation be liable for any damages whatsoever (including, without limitation, damages for loss of business profits, business interruption, loss of business information, or other loss) arising out of the use of or the results of use of or inability to use such documentation, even if GS1 US has been advised of the possibility of such damages.

IAPMO

In this publication, the letters "U.P.C." are used solely as an abbreviation for the "Universal Product Code" which is a product identification system. They do not refer to the UPC, which is a federally registered certification mark of the International Association of Plumbing and Mechanical Officials (IAPMO) to certify compliance with a Uniform Plumbing Code as authorized by IAPMO.

*If applicable

GS1 US Corporate Headquarters

Princeton South Corporate Center, 300 Charles Ewing Boulevard
Ewing, NJ 08628 USA
T +609.620.0200 | **E** info@gs1us.org
www.gs1us.org

Connect With Us

0614141029686v1.0