



2D barcodes case study

# BNH & Joinsalesbi: Pioneering the 2D Revolution in Dental Logistics from Bragança to the World

Introductory How the adoption of GS1 DataMatrix reduced inbound processing time by 90% and achieved zero-error dispatch in medical device distribution



## Challenge

BNH faced critical operational bottlenecks caused by the technical limitations of traditional 1D barcodes, which could only store basic product identification. In the highly regulated dental sector, managing batches and expiration dates is mandatory, yet these details had to be typed manually into the system, leading to frequent human errors and slow receiving workflows. This lack of automation hindered the implementation of a reliable FEFO (First Expired, First Out) strategy and created significant difficulties in labeling the extremely small surfaces of precision medical devices. Consequently, BNH sought a technological leap with Joinsalesbi to eliminate data silos, ensure 100% traceability, and prepare for the global transition to 2D standards.

## Solution

Working with Joinsalesbi, BNH overhauled its logistics by integrating GS1 DataMatrix technology directly into its WMS and upgrading to omnidirectional 2D imagers. This technical synergy enabled the automatic parsing of complex data strings, capturing IDs, batches, and expiration dates in a single scan. By redesigning labeling processes for micro-sized products and digitizing picking routes, the project replaced manual workflows with a high-speed, automated data capture system. This shift ensured absolute inventory accuracy and full regulatory compliance across the entire product catalog.

## Benefits

The adoption of 2D standards transformed BNH's operational efficiency by allowing the instantaneous capture of batch and expiry data in a single scan. This shift eliminated manual typing errors and ensured a rigorous inventory management based on FEFO principles, drastically reducing financial losses from expired stock. Beyond full compliance with UDI regulations, the technology enabled high-density labeling on micro-products. The result was a monthly saving of hundreds of labor hours and an increase in inventory accuracy to levels of excellence.

## The Transition to GS1 2D Standards

The transition to 2D barcodes marked a pivotal shift for BNH, moving away from the restrictive nature of linear codes towards the globally recognized GS1 DataMatrix standard. Guided by Joinsalesbi's technical expertise, the project focused on embedding critical data—such as GTINs, batch numbers, and expiration dates—into a single, compact symbol. This alignment with GS1 standards ensured that BNH's logistics reached a level of universal interoperability, preparing the company for the "Global Sunrise 2027" initiative and meeting the strict regulatory demands of the medical and dental sectors.

Joinsalesbi's intervention was crucial in re-engineering the warehouse's digital infrastructure to support this new multidimensional data flow. The team implemented advanced scanning hardware and updated the WMS to interpret GS1 Application Identifiers automatically, replacing manual data entry with high-speed digital capture. This technological leap allowed BNH to maintain 100% traceability even on the smallest dental instruments, where traditional barcodes were physically impossible to apply. The synergy between IT consultancy and operational needs turned a complex regulatory requirement into a competitive advantage.

The impact of adopting GS1 2D standards resulted in a complete transformation of inventory management and supply chain reliability. By digitizing the "FEFO" (First Expired, First Out) process, BNH eliminated the risk of shipping expired medical supplies, significantly enhancing patient safety and client trust. Operations that previously took minutes are now completed in seconds, resulting in a 90% gain in efficiency during stock reception. This successful transition positions BNH and Joinsalesbi as leaders in logistical innovation, setting a high benchmark for the dental distribution industry in Portugal.



## Impact and Future Possibilities

The impact of the 2D transition on BNH's daily operations has been transformative, most notably in the drastic reduction of processing times. By moving away from manual data entry, the receiving process for medical supplies was optimized by 90%, dropping from two minutes to just fifteen seconds per unit. This efficiency gain, orchestrated by Joinsalesbi's

integration, allows a small team of five operators to save approximately 400 hours of manual labor every month. These recovered hours have been redirected from repetitive administrative tasks to high-value logistical planning and quality control.

Beyond time savings, the project achieved a "zero-error" milestone in dispatch and inventory accuracy. The automated interpretation of GS1 DataMatrix codes ensured that stock precision reached 99.9%, virtually eliminating the risk of human error during picking. This level of accuracy is critical in the dental sector, where the wrong batch or an expired product can have direct clinical consequences. The system now acts as a digital safeguard, automatically blocking any item that does not meet the strict safety criteria required for medical distribution.

The financial sustainability of the investment was proven through a rapid Return on Investment (ROI), achieved in less than six months. By implementing native "First Expired, First Out" (FEFO) management, BNH significantly reduced losses associated with expired stock, which previously accounted for a notable percentage of waste. Joinsalesbi's solution turned a regulatory compliance necessity into a cost-saving engine, proving that technological modernization in Bragança's logistics hub is a driver for increased profitability and long-term business resilience.

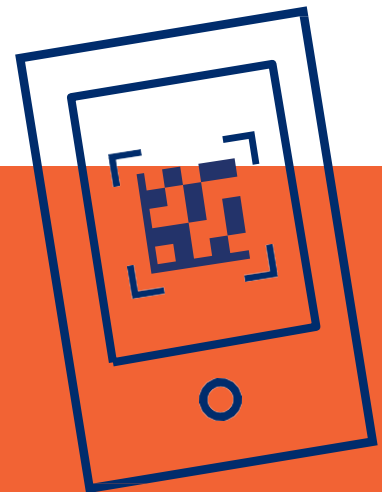
Looking ahead, this foundation opens a world of digital possibilities for BNH. The successful adoption of 2D standards paves the way for full serialization and the implementation of a dedicated customer portal, where dental clinics can track the entire lifecycle of their equipment. As the industry moves toward the "Global Sunrise 2027," BNH is already positioned as a leader in the digital supply chain. Future steps include expanding this 100% digital traceability to all global partners, ensuring that the company remains at the forefront of innovation in the Portuguese healthcare market.



## The Power of 2D Standards

The power of the 2D standard lies in its incredible data density, allowing BNH to encode complex information like batch numbers and expiration dates into a single square millimeter. Unlike traditional 1D codes, the GS1 DataMatrix provides a "single source of truth" that is captured instantly by modern imagers. This eliminates the need for multiple scans or manual typing, transforming a formerly prone-to-error process into a streamlined, high-speed digital operation.

Beyond speed, the 2D standard acts as a universal language that bridges the gap between BNH, its suppliers, and dental clinics. By adopting this global GS1 format, Joinsalesbi ensured that BNH's inventory is fully compliant with upcoming international regulations and the Sunrise 2027 initiative. This technological foundation not only secures current operations but also empowers the company to scale its logistics with 100% confidence in data integrity and patient safety.



### Get started with 2D barcodes by GS1

GS1 is working with industry to support 2D implementations and create guidance for assisting in the design of proof-of-concept demonstration pilots.

At a high level, consider the following elements:

**Retailers:** create a vision for use cases enabled by 2D barcodes, assess your current technical capabilities (scanners and back-office systems) to understand your roadmap to enable scanning of all barcodes, and collaborate with other stakeholders to ensure alignment on goals and outcomes.

**Brands, Manufacturers and Suppliers:** bring together your supply chain and marketing executives to collaborate on a combined barcode strategy that achieves both consumer engagement and supply chain goals.

**Solution Providers:** consider the upgrades needed to your systems to enable multiple barcode scanning/printing and support your end-users in achieving their top use cases enabled by 2D barcodes.

### Questions about the 2D future?

Contact your local GS1 Member Organisation to see how GS1 can help you begin your journey toward a new dimension in barcodes!

[www.gs1.org/contact](http://www.gs1.org/contact)