



Retail Pioneer BGN Optimizes the Supply Chain through Progress SOA and RFID Technologies



Solution Snapshot

Business Fit: BGN has integrated the business applications via SOA for its new Selexyz "SmartStores," and implemented item-level RFID tagging in order to optimize the supply chain, enhance the customer experience and achieve a competitive advantage.

Business Results: Leveraging Progress OpenEdge®, Sonic®, Apama®, and RFID third party technology the company has trimmed manual inventory steps, reduced the opportunities for error, and dramatically improved management of its supply chain process. Progress EasyAsk technology enables dynamic natural language book search for customers, both online and instore.

Operational Results: The Progress-based SOA distributed solution requires no in-store administrative staff, a critical component for the future scaling of the system.

IT Results: OpenEdge architecture allowed BGN to implement the application in approximately 60% of the time required with other solutions.

Business Challenge

The retail industry demands a balanced combination of operational efficiency and customer service. With competition as close as a web browser, successful 'bricks and mortar' retailers must exploit new enabling technologies and embrace new processes that improve internal operations and enrich the customer experience. No retailer better embodies the innovative approach required for success than Boekhandels Groep Nederland (BGN), a Dutch retailer that has opened Selexyz, one of the world's first customer-focused, automated retail stores which it calls a 'SmartStore'.

Solution

BGN is the premiere book retailer in the Netherlands with more than 40 stores, 730 employees, and over 11 million visitors a year. Its Selexyz stores carry between 25,000-275,000 books, with the chain selling between 15,000-40,000 books per day. BGN has embarked on a Progress®-based automation program that integrates its business applications with a service-oriented architecture (SOA) and implements item-level radio frequency identification (RFID) tagging to optimize its supply chain and enhance the customer experience. BGN is launching two new, fully-automated 'SmartStores' that combine item-level RFID tagging and SOA to deliver a tightly integrated 'warehouse-to-consumer' supply chain. The first SmartStore is located in Almere, Netherlands.



“People had to check each box manually, and it would take up to five or six minutes to check a box of books. Now, the time is reduced through this technology to less than ten seconds.”

—Jan Vink
IT Director, BGN

RFID Enabling Supply Chain and Retail Processes

The Selexyz strategy for store automation leverages the unique technical strengths and business value of the Progress Software portfolio. Progress OpenEdge is the core business platform for the applications managing the Selexyz book inventory. Progress EasyAsk®, a natural language search application, helps power in-store customer kiosks that inform consumers whether a store carries a book, if it is in stock, and where the book is located in the store. In turn, EasyAsk® leverages Progress Webspeed® to access the Selexyz book tracking application—Atlas—also based on OpenEdge® platform. The Progress Apama ESP Platform provides RFID event processing services that monitor and analyze (in real-time) inbound RFID data received at the store. Information captured by Apama is correlated with data sent by the distributor via Advanced Shipping Notices (ASNs). And bringing it all together is the Sonic® Enterprise Service Bus (ESB), the Progress SOA-based integration fabric built on a standards-based messaging infrastructure. The result is a distributed solution that requires no in-store administrative staff, a critical component for future scaling of the system.

Unlike RFID solutions that tag at the pallet or case-level, Selexyz is using RFID to track the movement of individual books. Item-level tagging provides the retailer with unique real-time visibility into both store inventory and its supporting supply chain activities. Selexyz can trim manual inventory steps, reduce the opportunities for error and dramatically improve management of a supply chain process that begins with Centraal Boekhuis (central book warehouse). Centraal Boekhuis is Holland’s leading book distributor of 50 million books annually throughout the Netherlands and originator of 80%-90% of the Selexyz inventory. The Selexyz automation initiative spans a process that begins with the distributor and ends at the hands of the customer.

Anatomy of the Selexyz System

Shipment Preparation and Processing

A Selexyz store will issue an order to the Centraal Boekhuis' database via the Sonic ESB®. RFID tags are generated and affixed to the books, with each tag encoded with an item-level serial number. The books are packaged for shipping, with an Advance Shipping Notice (ASN) generated that lists each book in the shipment, the box in which it is placed, and the destination within the store. The ASN captures the connection between the individual RFID tag and the ISBN (International Standard Book Number) for the book to which the tag is affixed.

Selexyz Central Operations Processing

The ASN is sent to Selexyz's central IT operations, where it is automatically updated with customer and order information from the Selexyz Progress-based back-office system and distributed to the individual store through the Sonic ESB. At the order's final destination, another Progress-based application, Atlas, manages Selexyz's RFID-based physical stock and updates it with the ASN data.

Store Receipt and Processing

As shipments arrive at the Selexyz store, the boxes pass through an RFID tunnel where RFID readers scan the book tags while the books remain in their boxes. Each RFID scan generates a Sonic message event that is sent to the Progress Apama event processing platform. Apama immediately correlates the RFID data with the ASN data previously received. Apama's real-time reconciliation of the RFID data (as delivered by the Sonic ESB) with the ASN data (via the store OpenEdge application, Atlas) confirms box content and updates store inventory.

Store Distribution

Based on that real-time correlation, books are identified as:

- Standard shipments to be treated as inventory replenishment.
- Special customer orders that are sent to a location for customer pickup.
- Some form of shipment exception that must be put aside for special handling and reconciliation.

In Store Customer Kiosks

Selexyz customers can use the natural language features of Progress EasyAsk, available at in-store kiosks, to query the store's inventory to find the books they seek. Here, again with the assistance of RFID, the customer can tell exactly where the books can be found, even if a copy might have been misplaced. Location of books within the store is determined by store shelves that have their own RFID tags. A store staffer makes a trip throughout the store using a cart that is equipped with an RFID reader. That mobile scan operation generates Sonic message events for each tag signal and associates the location of individual books with the tag of the shelves, thereby determining the book's location and passing that information to the in-store Atlas system. In turn, Atlas can report to shop employees when books are found at unexpected locations.

With the combination of Progress technologies, the Selexyz supply chain now has updated, accurate information about book shipments, and a more efficient, less labor-intensive process. Information is now more easily accessible to Selexyz staff and customers through the EasyAsk natural language capability to query back-end systems, assisted by the real-time information provided through the Apama-enabled RFID data capture process.

Achieving Value with Progress

Application Design, Development and Deployment—In 60% of the Time

The OpenEdge reference architecture accelerated the design and development of the Selexyz book tracking application, allowing Selexyz to implement the application in approximately 60% of the time it would have otherwise required. The accelerated "model-to-deployment" approach provided Selexyz with an accelerated time-to-market solution.

Real-Time Event Processing—Automated RFID Insight

The Progress Apama Event Stream Processing (ESP) application enables instant recognition of the books in a shipment and gives employees immediate handling instructions as the tagged books pass through the RFID tunnel, eliminating the need to unpack boxes and search for books. Selexyz systems can automatically inform staff on the composition of the shipments—reducing the time and labor needed to process inbound deliveries while increasing shipment handling accuracy.

Natural Language Query—Finding Books with Everyday Language

Progress EasyAsk provides Selexyz customers with an elegant way to find the books they seek, as well as assistance when they're not sure what they might want. Customers can query in their own language ("Find me a book on sailing") and continue to search on iterative results, narrowing down search results until they find the book that matches their needs



"With this RFID solution in store, you can perform an inventory in less than two hours with two FTEs. In the existing stores you have to close down the whole store and execute the inventory with 20 to 25 employees. This will save us 260,000 euros on a yearly basis."

—Jan Vink
IT Director, BGN

("Now search [the books on sailing] for any written for children"). This intuitive query model, with its browser-based interaction with the Selexyz inventory system, enables customers to quickly refine book searches of an inventory that exceeds 900,000 titles. Enriching the customer experience also reduces the demands upon sales associates and ultimately leads to greater book sales.

SOA-Based Integration—Connecting Everything

All the elements of the Selexyz distributed systems are connected by the Sonic Enterprise Service Bus, which provides a SOA-based communications backbone. Selexyz's back office functions are integrated within the retail store operations and RFID event data management. With the Sonic ESB, Selexyz can more easily expand the scope of its solution with new services in the future, incorporating smart shelves, for example.

Item-Level RFID Tagging and Data Capture

Progress has teamed with hardware partner CaptureTech to provide Selexyz with the RFID infrastructure required to support the Selexyz implementation. CaptureTech provides the readers, antennae and associated services that enable both Selexyz and Centraal Boekhuis to deliver market-leading RFID capabilities. With the assistance of CaptureTech RFID expertise and the decision to use Gen2 RFID tags, Selexyz is achieving high fidelity scanning of books while in their shipping boxes, enhancing data capture significantly.

The Real Payoff: Customer Service

Unlike automation projects focused exclusively on operational efficiency, the Selexyz initiative is equally focused on value to its customers. In addition to using RFID to improve management of its regular book inventory (with customer access via kiosks), the new system also greatly enhances the handling of customer-ordered books. Upon delivery of special orders to the store, the books are now easily identified and routed to a separate stockroom, with automatic notification to customers via email or SMS. In the past, the process required opening the boxes for manual identification and alphabetic sorting on the stockroom shelves; now the books can remain in their boxes. In the stockroom, tags on the stockroom shelves enable the systems to correlate the book identity with its location. When customers come to the store to pick up their order, the shop staff can find the book by querying the RFID-enabled system. A previously cumbersome manual process, with ample opportunity for error, has been significantly improved.

Powered by Progress technologies, BGN's innovative new system has revolutionized retail automation. Whether online or in-store, BGN can now deliver an outstanding shopping experience.

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