



Debugging Sustainability: **How Testing Makes Retail Greener!**



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About Me



European Testing Awards - Testing
Champion of the year Finalist

Quality Engineering Enthusiast,
Mentor

Key Highlights

- **Founder of The QE Hub:** Driving Innovation, Excellence, and Collaboration in Quality Engineering in Retail.
- **Versatile and High-Energy Technocrat with 18+ years of experience.**
- **Proven Track Record in Large-Scale Transformations.**

Geo-Domain Experience

- **~14 Years in the UK Market:** With organizations Experian, Under Armour, Walgreens Boots Alliance, Harrods, NBrown Group, UST, G10X.
- **13 Years in Retail and eCommerce.**
- **5+ Years in Financial Services with Experian UK**

Why Sustainability Matters in Retail

Retail Industry - ~25% contributor to carbon emissions

Clothing Retail industry = ~10% of global CO₂ emissions

Untapped potential for sustainability improvements

Focus on operational, fulfillment & Customer touchpoints

Digital innovations to reduce paper, emissions, and waste

The global environmental impact

Paper Receipts & Shelf labels

- **3 trillion** paper receipts globally/year = **~50 million** trees, **~10 billion** gallon water
- **U.S** generates **1.5 billion lbs** of receipt waste
- **UK** - around **1.2 billion** receipts
- Receipt production is responsible for: **334 million** lbs of waste

Delivery & Shipment

- **~19** million tonnes **CO₂** in the world's top **100** cities
- CO₂ emission equal to burning **4.5 billion** lbs of coal or **~2.05 million** cars per year
- Post-pandemic emissions - boosted by **25%**, contributing **~100 million** tonnes CO₂

Split Shipments & Multiple-Box

- Faster delivery and smaller parcels = Emissions comparable to **7 million cars**
- Parcel volume rose from **315 billion** in 2022 to projected **800 billion** parcels by 2030







Key Areas Driving Green Retail

- 1 Digital Receipts
- 2 Electronic Shelf Labels
- 3 Smart Fulfillment / Returns (BOPIS, BORIS, Ship From Store)
- 4 Reduced Returns via Recommended Sizing
- 5 Consolidated Shipments & Delivery Optimization

Deep Dive into Sustainability Initiatives

Digital Receipts

Products/Integrations

 POS,  CRM,  Digital Receipt Platforms,
 Communication Channels (Email/SMS/App),
 BI, &  Consent Management

Testing Focus

-  Data Accuracy
-  Rendering & Alignment
-  User Experience (Clarity, accessibility, usability)
-  Regulatory Compliance
-  Consent Management
-  Marketing Preferences
-  Personalisation

Success Story

Apple, Under Armour, Lululemon

Electronic Shelf

Products/Integrations

 Pricing Systems,  Inventory Management
 POS,  Communication Gateways
 Content Management

Testing Focus

-  Product Details & Variances
-  Pricing Alignment
-  Promotions
-  User Experience
-  Regulatory Compliance
-  Content Management
-  Marketing Initiatives











Success Story

Carrefour







Deep Dive into Sustainability Initiatives

BOPIS, BORIS, Ship From

Products/Integrations

 eComm / App,  POS,  Payment Platforms
 OMS,  WMS,  CRM,  Inventory
 Comms (Email/SMS/App),
 BI &  Consent Management

Testing Focus













 Order Processing
 Cross-channel Payment
 Tax Calculations
 Order Management & Fulfilment
 Cross-channel Data Accuracy
 Return / Refund Workflow
 Customer Communications

Success Story







Target, Under Armour, John Lewis

Shipments & Delivery

Products/Integrations

 eComm / App,  POS,  Payment Platforms
 OMS,  WMS,  Logistic Management,
 Shipping Carrier Integration  CRM,  Inventory,
 Comms (Email/SMS/App),  BI &  RFID Tracking

Testing Focus

 Order Lifecycle Validation
 Inventory Accuracy & Sync
 Warehouse & Fulfilment Flow
 Carrier Integration & API Communication
 Route & Transportation Optimization Logic
 Return / Refund Process
 Customer Notifications & Triggers

Success Story

Amazon

Why Testing is Non-Negotiable in Retail Sustainability

Sustainability without precision can backfire: poor adoption, wasted resources, greenwashing risks.

Every initiative must be tested for:



Audience alignment



Data accuracy



Data integrity



Operational quality



Regulatory Compliance



Environmental impact



Data-driven insights & Reporting accuracy

Thank You!



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