DataGuard Green Shredding Platform

Product Concept Document - Volume 2

Prepared for: DataGuard Document Management Limited
Date: February 2026
Document Type: Product Concept & User Journey Specification
Volume: 2 of 3 (Detailed Feature Specifications, User Stories, Process Flows)

---

4. Detailed Feature Specifications

4.1 Feature Prioritization Framework

MoSCoW Method

Features categorized using MoSCoW prioritization for MVP and subsequent releases:

- **Must Have (MVP):** Critical features without which the platform cannot function
- **Should Have (Release 2):** Important features that add significant value but MVP can launch without
- **Could Have (Release 3+):** Desirable features that enhance user experience
- **Won't Have (Future):** Features acknowledged but deferred to later phases

MVP Feature Set (Month 1-6)

\begin{table}

Feature Module	Priority	Rationale
User Authentication and Management	Must Have	Foundation for security and access control
Client Dashboard (basic)	Must Have	Core value delivery and engagement
Green Points Calculation Engine	Must Have	Key differentiator and loyalty mechanism
Collection Scheduling	Must Have	Operational necessity
Field Operations Mobile App	Must Have	Data collection and execution
Carbon Footprint Dashboard (basic)	Must Have	Environmental impact visibility
Certificate Generation	Must Have	Compliance and documentation
Admin Console (basic)	Must Have	Operations management

\end{table>

4.2 Module 1: User Authentication and Management

Feature Overview

Secure, role-based access control system supporting multiple user types across client organizations and DataGuard internal teams.

Core Capabilities

1. **User Registration and Onboarding**
   - Email-based invitation system
   - Self-service password creation with strength requirements (minimum 8 characters, uppercase, lowercase, number, special character)
   - Email verification via confirmation link
   - Optional phone verification for enhanced security
   - First-time login wizard guiding users through profile completion
2. **Authentication Methods**
   - Email and password (primary)
   - Single Sign-On (SSO) via OAuth 2.0 or SAML 2.0
   - Supported identity providers: Azure AD, Google Workspace, Okta
   - Two-factor authentication (2FA) via SMS or authenticator app (Google Authenticator, Microsoft Authenticator)
   - Session management with configurable timeout (default 30 minutes inactive)
3. **Role-Based Access Control (RBAC)**
   \begin{table}

Role	Permissions
Corporate Admin	Full account management, user provisioning, billing, configuration, all reporting
Sustainability Manager	View environmental dashboards, download reports, manage targets, carbon credit access
Branch User	View site-specific data, request collections, view schedule, limited reporting
Finance User	View invoices, payment history, Green Points balance, financial reports
Executive Viewer	Read-only access to executive dashboard and high-level reports
DataGuard Operations Manager	View all client data, manage collections, assign jobs, operational analytics
DataGuard Field Agent	Mobile app access, collection execution, data capture
Partner (Tissue Manufacturer)	Supply chain visibility, production coordination
Partner (Carbon Verifier)	Audit data access, verification documentation

\end{table>

4. **Multi-Tenant Architecture**
    - Complete data isolation between client organizations
    - Each tenant (client) has unique database schema or namespace
    - No cross-tenant data visibility or access
    - Tenant-specific branding (logo, color scheme) for white-label capability
5. **User Profile Management**
    - Editable profile: name, email, phone, photo, job title
    - Notification preferences: email, SMS, push notifications
    - Language selection (English primary, Yoruba/Hausa/Igbo future)
    - Timezone configuration for accurate scheduling

User Stories

US-AUTH-001: As a Corporate Administrator, I want to invite team members via email so that I can grant them appropriate access to the platform.

Acceptance Criteria:

- Admin can enter multiple email addresses separated by commas
- Admin selects role for each invitee from dropdown
- System sends invitation email with unique activation link valid for 7 days
- Invitee receives email with clear instructions and company branding
- Invitation status tracked in admin console (pending, accepted, expired)

US-AUTH-002: As a new user, I want to set up my account using a secure password so that I can access the platform safely.

Acceptance Criteria:

- Password strength indicator displayed in real-time
- System enforces minimum requirements (8 characters, mixed case, number, special character)
- Confirmation field prevents typos
- User can toggle password visibility
- Success message displayed upon account creation

US-AUTH-003: As a Sustainability Manager, I want to enable two-factor authentication so that my account is protected from unauthorized access.

Acceptance Criteria:

- 2FA configuration accessible from profile settings
- User can choose SMS or authenticator app method
- Setup wizard guides through QR code scanning or phone number entry
- Backup codes generated and displayed for account recovery
- 2FA can be disabled with password confirmation

US-AUTH-004: As a Corporate Administrator, I want to integrate our company's Azure AD so that employees can use existing credentials.

Acceptance Criteria:

- SSO configuration wizard within admin console
- Admin provides identity provider details (issuer URL, certificate)
- Test connection validates configuration before saving
- Users see "Sign in with Azure AD" button on login page
- Successful SSO login automatically provisions user account with default role

4.3 Module 2: Client Dashboard

Feature Overview

Primary interface for client users displaying real-time Green Points balance, environmental impact metrics, upcoming collections, and quick actions.

Dashboard Components

1. **Header Section**
    - Company logo and name
    - Navigation menu: Dashboard, Collections, Marketplace, Reports, Settings
    - User profile dropdown with account settings and logout
    - Notification bell icon with unread count badge
2. **Key Metrics Cards (Top Row)**
   \begin{table}

Metric Card	Data Displayed	Visual Treatment
Green Points Balance	Current points with trend arrow	Large number, green color, sparkline chart
Paper Recycled (MTD)	Tonnes this month vs. last month	Weight icon, percentage change
Carbon Credits	Total credits earned, pending verification	Leaf icon, status indicator
Next Collection	Countdown timer to next scheduled pickup	Calendar icon, location name

   \end{table>
3. **Environmental Impact Visualization**

   Interactive chart showing:
    - Trees saved equivalent
    - Water conserved (liters)
    - CO_2 emissions avoided (tonnes)
    - Landfill space saved (cubic meters)
    - Energy saved (kWh)

   Visualization options:
    - Bar chart comparing current month to previous months
    - Pie chart showing contribution by site/location
    - Line graph showing cumulative impact over time
    - Toggle between metric types via tabs or dropdown
4. **Recent Collections Table**

   Displays last 10 collections with columns:
    - Date and time
    - Location/site name
    - Paper weight collected (kg)
    - Green Points earned

    - Certificate download link
    - Status indicator (completed, verified, processed)

    Interactions:
    - Click row to view collection details modal
    - Filter by date range, location, status
    - Export to CSV or PDF
5. **Upcoming Collections Calendar**
    - Calendar view (month, week, list) showing scheduled collections
    - Color-coded by site or collection type
    - Hover tooltip displays time, location, contact person
    - "Request Additional Collection" button prominently displayed
6. **Quick Actions Panel**
    - Request On-Demand Collection
    - Browse Marketplace
    - Download Latest Report
    - View Carbon Credit Portfolio
    - Contact Support
7. **Activity Feed (Right Sidebar)**

    Real-time updates:
    - "Collection completed at Lagos HQ - 45kg collected, 450 points earned"
    - "New carbon credits verified: 25 tonnes CO_2e"
    - "John Doe redeemed 10,000 points for tissue products"
    - "Your Q1 sustainability report is ready"
8. **Gamification Elements**
    - Progress bar toward next tier milestone (Bronze, Silver, Gold, Platinum client status)
    - Badges earned for achievements: "Early Adopter," "Carbon Champion," "100 Tonne Club"
    - Leaderboard (optional, can be enabled/disabled per client): top branches by Green Points earned

Responsive Design

- Desktop (1920x1080): Full dashboard with all widgets visible
- Tablet (1024x768): Two-column layout, collapsible sidebar
- Mobile (375x667): Single column, prioritized content, hamburger menu

User Stories

US-DASH-001: As a Branch User, I want to see my site's Green Points balance immediately upon login so that I know how much we've earned.

Acceptance Criteria:

- Green Points balance displayed prominently in top metric card
- Number animates when page loads (count-up effect)
- Trend indicator shows increase/decrease from last month
- Click on card opens detailed Green Points transaction history

US-DASH-002: As a Sustainability Manager, I want to visualize our environmental impact in different ways so that I can communicate effectively with stakeholders.

Acceptance Criteria:

- Impact visualization section includes 4+ chart types (bar, line, pie, area)
- User can toggle between chart types via tabs
- User can filter by date range (last 30 days, last quarter, last year, all time)
- Charts update dynamically without page refresh
- Export button generates high-resolution PNG for presentations

US-DASH-003: As a Corporate Administrator, I want to see upcoming collections across all sites so that I can ensure nothing is missed.

Acceptance Criteria:

- Calendar view displays all scheduled collections with location labels
- Color-coding distinguishes sites or collection types
- User can filter calendar by site, date range, collection type
- Click on calendar event opens collection details modal
- "Request Collection" button opens scheduling form with site pre-selected

4.4 Module 3: Green Points Calculation Engine

Feature Overview

Automated system that calculates Green Points earned based on paper weight collected, applies multipliers and bonuses, updates client balances in real-time, and maintains transaction history.

Calculation Logic

1. **Base Points Formula**

$$\text{Base Points} = \text{Weight (kg)} \times \text{Base Rate (points/kg)}$$

   Standard base rate: **10 points per kg of paper collected**
2. **Multipliers and Bonuses**
   \begin{table}

Multiplier Type	Condition	Multiplier Value
Subscription Tier	Enterprise tier clients	1.2x
Volume Bonus	Collections over 100kg	1.1x
Consistency Bonus	90%+ collection completion rate	1.15x
Carbon Credit Participation	Clients sharing carbon credits	1.1x
Referral Bonus	Referring new client that signs	+5,000 points

   \end{table>

3. **Final Points Calculation**

$$\text{Final Points} = \text{Base Points} \times \text{Tier Multiplier} \times \text{Volume Multiplier} \times \text{Consiste}$$

4. **Special Promotions**

   System supports configurable promotional campaigns:
   - "Double Points Weekend" - 2x points for collections during specified period
   - "New Location Bonus" - 500 bonus points for first collection at new site
   - "Milestone Rewards" - 10,000 bonus points when reaching 1 tonne recycled
5. **Point Expiration Policy**
   - Points expire 24 months after earning date
   - Automated email notification 60 days before expiration
   - Expired points deducted from balance automatically
   - Transaction history maintains record of expired points

Transaction Management

1. **Transaction Types**
   - **Earned:** Points credited from completed collections
   - **Redeemed:** Points debited for marketplace purchases or service credits
   - **Adjusted:** Manual corrections by DataGuard admin (with justification note required)
   - **Expired:** Points removed due to 24-month expiration
   - **Bonus:** Special promotional or referral bonuses
2. **Transaction Record Attributes**
   - Transaction ID (unique)
   - Tenant ID (client organization)
   - User ID (if applicable)
   - Transaction type
   - Points amount (positive for credit, negative for debit)
   - Balance after transaction
   - Timestamp
   - Reference ID (collection ID, order ID, etc.)
   - Description/notes
   - Earning date (for expiration tracking)
3. **Balance Calculation**

   Real-time balance computed as:

$$\text{Current Balance} = \sum(\text{Earned Points}) - \sum(\text{Redeemed Points}) - \sum(\text{Expir}$$

   Balance recalculated on every transaction and cached for performance.

User Stories

US-POINTS-001: As a Branch User, I want to see how many Green Points were earned from each collection so that I understand the reward calculation.

Acceptance Criteria:

- Collection details modal displays points earned breakdown
- Breakdown shows: base points, multipliers applied, bonus points, total
- Formula explanation provided in tooltip or expandable section
- Historical collections display points earned in table column

US-POINTS-002: As a Corporate Administrator, I want to view a complete transaction history of all Green Points activity so that I can audit and reconcile our account.

Acceptance Criteria:

- Transaction history page displays all transactions with filters (date range, type, site)
- Each transaction shows date, type, amount, balance after, reference, description
- Export to CSV for external analysis
- Search functionality by transaction ID or reference
- Running balance column shows balance progression

US-POINTS-003: As a Sustainability Manager, I want to receive notifications when points are about to expire so that we don't lose earned rewards.

Acceptance Criteria:

- Automated email sent 60 days before point expiration
- Email lists specific points expiring and earning date
- Dashboard widget displays "Points expiring soon" alert
- User can click through to view expiring points and redemption options

US-POINTS-004: As a DataGuard Operations Manager, I want to manually adjust a client's Green Points balance when there's a legitimate error so that we can maintain trust and accuracy.

Acceptance Criteria:

- Admin console includes "Adjust Points" function accessible only to senior operations staff
- Adjustment form requires: points amount (positive or negative), justification note, approval from manager
- Adjustment creates transaction record visible to client with explanation
- Audit log captures who made adjustment, when, and why

4.5 Module 4: Carbon Footprint Dashboard

Feature Overview

Comprehensive environmental impact tracking and reporting module that translates paper recycling into verified carbon reductions, displays ESG metrics, and generates audit-ready documentation.

Core Metrics Tracked

1. **Carbon Emissions Avoided**

   Formula based on verified life cycle assessment (LCA) methodology:

$$\text{CO}_2\text{e Avoided (tonnes)} = \text{Paper Recycled (tonnes)} \times 1.6$$

Calculation rationale:

- Recycling 1 tonne of paper saves approximately 1.6 tonnes CO_2e
- Includes avoided deforestation, reduced energy consumption in paper production, methane avoidance from landfill diversion
- Methodology aligned with VCS and Gold Standard carbon credit protocols[1][2]

2. **Trees Saved Equivalent**

$$\text{Trees Saved} = \frac{\text{Paper Recycled (tonnes)}}{0.017}$$

Assumes 17kg of paper per tree (industry standard).

3. **Water Conserved**

$$\text{Water Saved (liters)} = \text{Paper Recycled (tonnes)} \times 26{,}000$$

Recycling paper saves approximately 26,000 liters of water per tonne versus virgin paper production.

4. **Energy Saved**

$$\text{Energy Saved (kWh)} = \text{Paper Recycled (tonnes)} \times 4{,}000$$

Recycling consumes 60-70% less energy than producing virgin paper.

5. **Landfill Diversion**

$$\text{Landfill Space Saved } (\text{m}^3) = \text{Paper Recycled (tonnes)} \times 3$$

Average density of compacted paper waste.

Dashboard Visualizations

1. **Impact Summary Cards**

Grid of metric cards displaying:

- Large number with unit (e.g., "127.5 tonnes CO_2e")
- Icon representing metric (tree, water drop, lightning bolt, trash bin)
- Percentage change vs. previous period
- Miniature trend line (sparkline)

2. **Cumulative Impact Over Time**

Multi-line or area chart showing:

- X-axis: Time (months or quarters)
- Y-axis: Selected metric (switchable via dropdown)
- Multiple series: Paper collected, CO_2 avoided, trees saved

    - Annotations for milestones (e.g., "Reached 100 tonnes recycled")
3. **Site-Level Breakdown**

   Bar chart or table showing:
    - Sites ranked by environmental impact contribution
    - Paper weight collected per site
    - CO_2 avoided per site
    - Percentage of total organizational impact

   Enable friendly competition and identification of high-performing locations.
4. **Comparison to Benchmarks**
    - Client's impact vs. industry average (anonymized peer data)
    - Client's impact vs. their own targets
    - Client's impact equivalent to common comparisons: "Equal to removing X cars from the road for one year"
5. **Carbon Credit Portfolio**

   Dedicated section showing:
    - Total carbon credits generated to date
    - Credits by status: pending verification, verified and issued, retired, transferred
    - Registry links for verification
    - Allocation between client and DataGuard (per agreement)
    - Estimated market value based on current carbon pricing

ESG Reporting Integration

1. **Automated Report Generation**

   Quarterly and annual sustainability reports auto-generated including:
    - Executive summary with key achievements
    - Detailed metrics tables
    - Year-over-year and baseline comparisons
    - Methodology explanation and verification sources
    - Carbon credit documentation
    - Chain of custody documentation

   Report formats:
    - PDF (branded with client logo)
    - CSV (for data import)
    - JSON (for API integration)
    - PowerPoint (slide deck with charts)
2. **API Export to ESG Platforms**

   RESTful API endpoints enabling integration with:
    - Watershed Climate Platform[3]
    - Persefoni Carbon Accounting[3]
    - Sweep ESG Intelligence
    - Custom corporate sustainability databases

   API provides:
    - Monthly aggregated metrics
    - Transaction-level collection data
    - Verification documentation URLs

        - Real-time data sync or scheduled batch exports
3. **Certification and Verification**
    - Certificate of Destruction for each collection batch
    - Certificate of Recycling documenting paper processing
    - Carbon Credit Verification Statement from approved body
    - All certificates digitally signed and include:
        - Unique certificate ID
        - QR code for online verification
        - Client details
        - Collection details (date, weight, location)
        - Environmental impact summary
        - Verification body stamp/signature

User Stories

US-CARBON-001: As a Sustainability Manager, I want to view real-time carbon emissions avoided so that I can report progress toward our carbon neutrality goal.

Acceptance Criteria:

- Carbon dashboard displays total CO_2e avoided with large, prominent number
- Dashboard shows progress bar toward annual carbon reduction target
- User can filter by date range to see monthly, quarterly, or annual totals
- Calculation methodology link explains 1.6x factor and verification standard
- Dashboard updates within 1 hour of collection completion

US-CARBON-002: As an Executive Viewer, I want to download a presentation-ready sustainability report so that I can share achievements with the board.

Acceptance Criteria:

- "Download Report" button generates PowerPoint file within 30 seconds
- Report includes executive summary slide, key metrics slides with charts, methodology slide
- All charts are high-resolution and editable
- Client logo and branding applied throughout
- Report date range and generation timestamp included

US-CARBON-003: As a Sustainability Manager, I want to export data to our corporate ESG platform so that paper recycling integrates with our overall sustainability tracking.

Acceptance Criteria:

- Export page offers CSV, JSON, and API integration options
- CSV format matches Watershed or Persefoni import templates[3]
- User can select date range and metrics to export
- Export includes verification references and documentation URLs
- Scheduled exports can be configured to run monthly automatically

US-CARBON-004: As a Corporate Administrator, I want to access carbon credit verification certificates so that our auditors can validate ESG claims.

Acceptance Criteria:

- Carbon credit section lists all verified credits with status
- Each credit entry has "Download Certificate" button
- Certificate PDF includes unique ID, verification body details, methodology reference
- QR code on certificate links to online verification page
- All certificates stored permanently and accessible anytime

4.6 Module 5: Collection Management

Feature Overview

End-to-end collection scheduling, execution tracking, and logistics optimization system for both scheduled recurring collections and on-demand requests.

Scheduling Subsystem

1. **Recurring Collection Schedules**

   Configuration per site:
   - Frequency: Weekly, bi-weekly, monthly, quarterly, custom
   - Preferred day of week and time window (e.g., "Every Tuesday between 9 AM - 12 PM")
   - Contact person and phone number
   - Special instructions (e.g., "Use back entrance," "Call 15 minutes before arrival")
   - Bin IDs to be collected

   Automated schedule generation:
   - System generates collection jobs based on recurring schedule rules
   - Jobs created 30 days in advance
   - Notifications sent to clients 7 days before scheduled date, 24 hours before, and 1 hour before arrival
2. **On-Demand Collection Requests**

   Client-initiated request flow:
   - User selects site from dropdown
   - User selects urgency: Standard (3-5 business days), Express (24-48 hours), Emergency (same day, surcharge applies)
   - User enters reason (optional): "Bins full," "Special project," "Office closure"
   - User uploads photos of full bins (optional)
   - System provides estimated pickup date based on logistics availability
   - Request submitted and enters approval workflow if configured

   Operations team receives request:
   - Request appears in Operations Manager dashboard pending assignment
   - System suggests optimal assignment based on route proximity and vehicle capacity
   - Operations Manager confirms or adjusts pickup date and assigns driver
   - Client receives confirmation notification
3. **Route Optimization**

   Algorithm considers:
   - Geographic proximity of collection sites
   - Traffic patterns and estimated travel times
   - Vehicle capacity constraints

- Driver shift hours
- Collection time windows
- Priority level (express requests prioritized)

Optimization goals:

- Minimize total distance traveled (fuel savings)
- Maximize collections per vehicle per day
- Ensure on-time arrival within scheduled windows
- Balance workload across drivers

Integration with Google Maps API or Mapbox for real-time traffic data and route calculation.

Execution Tracking

1. **Field Operations Mobile App**

   Driver workflow:
   - Login to mobile app at start of shift
   - View today's route with numbered stops on map
   - Navigate to each stop using integrated GPS navigation
   - At collection site:
     - Mark arrival (GPS timestamp captured)
     - Scan bin QR codes to log which bins collected
     - Weigh paper using IoT scale (auto-sync) or manual entry
     - Capture photo of bins and collection area
     - Obtain digital signature from site contact
     - Add notes (e.g., "Bin damaged, needs replacement")
   - Mark job complete and proceed to next stop
   - End-of-day summary: total collections, total weight, route map

   Mobile app features:
   - Offline mode: data cached locally if connectivity lost, syncs when online
   - Real-time GPS tracking visible to Operations Manager
   - In-app navigation to collection sites
   - Camera integration for photo capture
   - Digital signature capture with stylus or finger
   - Push notifications for route changes or urgent instructions
2. **Real-Time Status Updates**

   Client portal displays collection status:
   - Scheduled: Date and time confirmed
   - En Route: Driver departed facility, ETA displayed
   - Arrived: Driver on-site
   - In Progress: Collection underway
   - Completed: Paper collected, weight captured
   - Verified: Data reviewed and approved by operations

   Status transitions trigger automatic email/SMS notifications to site contact.
3. **Exception Handling**

   Common exceptions:
   - Site inaccessible (gate locked, contact unavailable)
   - Bins empty or minimal paper (photo documented)

- Equipment failure (scale malfunction)
- Safety concern (hazardous material found in bins)

Exception workflow:

- Driver selects exception reason from predefined list
- Driver adds photo and notes
- Exception flagged in Operations Manager dashboard
- Operations Manager reviews and decides action: reschedule, abort, escalate to client
- Client notified of exception and resolution plan

Logistics Analytics

1. **Operational KPIs**

   Dashboard for Operations Manager:
   - On-time collection rate (target: 95%+)
   - Average collections per vehicle per day
   - Average cost per collection (fuel, labor, vehicle maintenance)
   - Route efficiency (km driven per kg collected)
   - Driver performance scores (on-time rate, data quality, client satisfaction)
2. **Client-Facing Metrics**

   Dashboard for Corporate Administrator:
   - Collection completion rate by site
   - Average paper weight per collection
   - Bin utilization rate (how full bins are at collection)
   - Historical collection trends (increasing, decreasing, seasonal)
3. **Predictive Analytics**

   Machine learning models (future enhancement):
   - Predict bin fill rates based on historical data
   - Recommend optimal collection frequency per site
   - Forecast paper generation for capacity planning
   - Identify anomalies (sudden drop in volume may indicate missed collections or process changes)

User Stories

US-COLLECT-001: As a Branch User, I want to request an additional collection when our bins are full so that paper doesn't overflow.

Acceptance Criteria:

- "Request Collection" button prominently available on dashboard and collections page
- Form pre-populates site information for branch user's location
- User selects urgency level with clear cost implications displayed
- User can upload photos of full bins
- Confirmation message displays estimated pickup date
- User receives email confirmation within 5 minutes

US-COLLECT-002: As a DataGuard Operations Manager, I want to view all scheduled collections for the week so that I can optimize driver routes.

Acceptance Criteria:

- Operations dashboard displays calendar view of all collections (list, map, timeline views available)
- Collections color-coded by status (scheduled, assigned, in progress, completed)
- Drag-and-drop to reassign collections to different drivers or dates
- "Optimize Routes" button triggers automatic route calculation
- Map view shows optimal route with numbered stops

US-COLLECT-003: As a Field Agent, I want to capture collection data on my mobile phone so that I don't need to carry paper forms.

Acceptance Criteria:

- Mobile app displays today's collections with addresses and contact info
- QR code scanner activates from app to log bin IDs
- Weight entry screen accepts manual input with numeric keypad or syncs from Bluetooth scale
- Photo capture integrated (multiple photos per collection)
- Digital signature capture with name confirmation
- "Complete Collection" button submits all data immediately

US-COLLECT-004: As a Corporate Administrator, I want to receive notifications when collections are completed so that I know service is being delivered reliably.

Acceptance Criteria:

- User can configure notification preferences in settings (email, SMS, push)
- Notification sent immediately when collection marked complete
- Notification includes site name, weight collected, Green Points earned, certificate link
- Notification settings allow per-site configuration (some sites notify, others don't)
- Weekly summary email lists all collections completed that week

---

5. Redemption Marketplace

5.1 Marketplace Overview

Purpose and Value Proposition

The Redemption Marketplace converts Green Points into tangible value, creating a closed-loop incentive system that drives client engagement and retention.

Client Value:

- Monetize environmental efforts through product rewards
- Reduce operational costs by offsetting purchases with points
- Reinforce employee engagement through visible rewards
- Contribute to circular economy by purchasing recycled products

DataGuard Value:

- Increase client retention (points create switching cost)
- Generate additional revenue through product margins
- Strengthen tissue manufacturer partnerships through demand
- Differentiate from commodity shredding competitors

5.2 Product Catalog

Product Categories

1. **DataGuard Branded Tissue Products**

   Made from recycled paper collected from clients:
   - Toilet tissue rolls (standard, premium)
   - Paper towels
   - Facial tissues
   - Napkins
   - Industrial wipers

   Pricing structure (points required):
   - Toilet tissue (12-roll pack): 8,000 points
   - Paper towels (6-roll pack): 6,500 points
   - Facial tissue boxes (5-pack): 4,000 points

   Product badges: "Made from YOUR recycled paper" with client-specific attribution if volume permits.
2. **Third-Party Eco-Friendly Products**

   Curated sustainable products from partner vendors:
   - Reusable water bottles
   - Solar-powered chargers
   - Bamboo office supplies
   - Organic cotton tote bags
   - Recycled plastic pens and notebooks

   DataGuard earns 20-25% margin on third-party products.
3. **Service Credits**
   - Additional bin rental credit (1 month): 5,000 points
   - Express collection upgrade: 10,000 points
   - Discount on next invoice: Points converted at rate of ₦0.80 per point
4. **Charitable Donations**
   - Plant trees in Nigerian forests: 2,000 points per tree
   - Support environmental NGOs (specific projects featured)
   - School sustainability programs

   Impact certificates issued for donated points showing specific project funded.

Product Information Management

Each product listing includes:

- Product name and description
- High-quality photos (multiple angles)
- Points cost prominently displayed
- Availability status (in stock, low stock, out of stock, coming soon)

- Estimated delivery time
- Sustainability story (e.g., "This product is made from 100% recycled paper collected from DataGuard clients")
- Customer reviews and ratings
- Related products suggestions

5.3 Redemption Process

User Workflow

1. **Browse and Search**
    - Navigate to Marketplace from main menu
    - Browse by category or search by keyword
    - Filter by: category, points range, availability, sustainability impact
    - Sort by: points (low to high), popularity, newest items
2. **Product Selection**
    - Click product tile to view detailed product page
    - Review photos, description, reviews
    - Check if sufficient points available (balance displayed at top)
    - Select quantity (if applicable)
    - Click "Redeem for X Points" button
3. **Checkout**
    - Review redemption summary: products, quantities, total points
    - Enter delivery information:
        - Recipient name
        - Delivery address (can select from saved company locations or enter custom)
        - Phone number
        - Delivery instructions
    - Confirm redemption (points deducted immediately)
4. **Order Confirmation**
    - Confirmation page displays order number and summary
    - Confirmation email sent immediately with order details and tracking information (when available)
    - Order appears in "My Redemptions" history
5. **Fulfillment Tracking**
    - Order status visible in portal: Processing, Shipped, Out for Delivery, Delivered
    - Email notifications at each status change
    - Delivery timeline estimated based on product type and location
    - Option to contact support regarding order
6. **Post-Redemption**
    - After delivery confirmation, user prompted to rate product and redemption experience
    - Reviews visible to other users in marketplace
    - Issue resolution process if product damaged or unsatisfactory

Redemption Business Rules

- Minimum redemption: 1,000 points
- Points deducted immediately upon order confirmation (non-refundable unless order cancelled by DataGuard)
- Redemption limits: Maximum 50,000 points per transaction to prevent abuse
- Delivery: Free delivery for redemptions over 20,000 points; ₦2,000 delivery fee for smaller redemptions (or 2,500 points)
- Availability: Out-of-stock products can be waitlisted; user notified when back in stock
- Cancellation: Users can cancel order within 24 hours if not yet shipped; points refunded

5.4 User Stories

US-MARKET-001: As a Branch User, I want to browse the marketplace and see products I can afford with my Green Points so that I can reward my team.

Acceptance Criteria:

- Marketplace homepage displays featured products and categories
- User's current points balance displayed prominently at top
- Products show points cost with affordability indicator (can afford / need more points)
- Clicking "Need More Points?" shows tips for earning points faster
- Filter allows showing only affordable products

US-MARKET-002: As a Corporate Administrator, I want to redeem points for tissue products and have them delivered to our office so that we close the loop on our recycling.

Acceptance Criteria:

- User adds tissue products to cart with selected quantity
- Checkout form allows selecting delivery address from list of company locations
- Order confirmation displays estimated delivery date
- User receives email confirmation with order details
- Order tracking page shows fulfillment status

US-MARKET-003: As a Sustainability Manager, I want to donate Green Points to environmental charities so that we can amplify our impact beyond our organization.

Acceptance Criteria:

- Marketplace includes "Charitable Donations" category
- Donation options display specific projects: tree planting, clean energy, education
- User selects project and enters points amount to donate
- Confirmation displays impact: "Your 10,000 points will plant 5 trees in Lagos State Forest"
- User receives impact certificate via email with project details and photos

US-MARKET-004: As a Finance User, I want to redeem points for service credits to reduce our next invoice so that we maximize financial value.

Acceptance Criteria:

- Service credit redemption option clearly explained: conversion rate (₦0.80 per point), maximum credit per invoice
- User selects points amount to convert
- System displays equivalent Naira credit
- Confirmation explains credit will be applied to next invoice
- Credit appears as line item on subsequent invoice

---

6. Administrative Console and Operations Management

6.1 Admin Console Overview

The DataGuard Admin Console is the internal operational hub for managing all aspects of the platform, clients, logistics, partnerships, and analytics.

Primary Users:

- DataGuard Operations Managers
- DataGuard Customer Support Staff
- DataGuard Finance Team
- DataGuard Executives

6.2 Client Management Module

Capabilities

1. **Tenant Account Administration**
    - View all client accounts with search and filter
    - Client profile details: company info, contract terms, subscription tier, billing status
    - Account status management: Active, Suspended, Churned, Trial
    - Contract history and renewal tracking
    - Usage statistics: collections completed, paper recycled, Green Points earned
2. **User Management**
    - View all users across all client tenants
    - Impersonate user (with audit logging) for support troubleshooting
    - Reset passwords, unlock accounts
    - Modify user roles or permissions (with approval)
3. **Support Ticketing**
    - Integrated support ticket system
    - Tickets created from: client portal submissions, email (support@dataguard.ng), phone calls, in-app chat
    - Ticket workflow: New, Assigned, In Progress, Resolved, Closed
    - SLA tracking: response time, resolution time targets
    - Knowledge base integration for common issues

6.3 Operations Dashboard

Key Operational Metrics

Real-time dashboard displaying:

\begin{table}

Metric	Target	Alert Threshold
Collections Completed Today	Actual vs. Scheduled	<90%
On-Time Collection Rate (7-day)	95%+	<92%
Average Collection Duration	15 minutes	>25 minutes
Fleet Utilization	80%+	<70%
Open Support Tickets	<20	>30
Client Satisfaction (NPS)	50+	<40

\end{table>

Collection Management

- Master schedule view: all collections across all clients
- Drag-and-drop job assignment to drivers
- Route optimization tool with map visualization
- Real-time vehicle tracking on map
- Exception management queue (missed collections, issues)
- Bulk actions: reschedule multiple jobs, reassign driver

Fleet and Resource Management

- Vehicle inventory: status, location, maintenance schedule
- Driver roster: availability, shift schedules, performance metrics
- Bin inventory: allocated, deployed, available, damaged
- Equipment tracking: weighing scales, GPS devices, maintenance

6.4 Financial and Billing Module

Billing Administration

1. **Invoicing**
    - Automated invoice generation based on subscription tier and usage
    - Invoice components: base subscription fee, additional collections, extra bins, overage charges, Green Points redemption credits
    - Invoice approval workflow before sending to client
    - Bulk invoice generation for all clients on billing cycle date
    - Invoice delivery via email with PDF attachment and payment link
2. **Payment Tracking**
    - Payment status: Paid, Pending, Overdue, Disputed
    - Integration with payment gateway for automatic payment reconciliation
    - Dunning process: automated reminders for overdue invoices

        - Collections management: escalation workflow for non-payment
3. **Revenue Analytics**
    - Monthly recurring revenue (MRR) tracking and trends
    - Revenue by client, by region, by subscription tier
    - Customer acquisition cost (CAC) and customer lifetime value (CLV) tracking
    - Churn analysis: churned clients, churn rate, churn reasons
    - Cohort analysis: retention curves by client acquisition cohort

6.5 Partnership Management Portal

Tissue Manufacturer Interface

- Supply forecast: projected paper availability for next 30, 60, 90 days
- Shipment scheduling: DataGuard schedules deliveries of shredded paper
- Quality metrics: acceptance rate, contamination incidents
- Production tracking: branded tissue products in production, completed, shipped to clients
- Financial reconciliation: revenue share calculations, payment schedules

Carbon Verifier Interface

- Project documentation repository: all collection records, chain of custody, audit trails
- Verification request submission by DataGuard
- Verifier uploads verification reports and certificates
- Carbon credit issuance tracking and registry integration
- Communication log between DataGuard and verifier

6.6 Platform Analytics and Reporting

Executive Dashboard

High-level KPIs for DataGuard leadership:

- Total active clients and growth trend
- Total paper recycled and environmental impact
- Carbon credits generated and value
- Revenue and profitability metrics
- Client satisfaction and NPS trends
- Operational efficiency metrics

Custom Reporting

Report builder tool:

- Select metrics, dimensions, filters
- Choose visualization type (table, chart, map)
- Schedule automated report delivery (daily, weekly, monthly)
- Export formats: PDF, Excel, CSV
- Share reports with specific users or roles

Data Export

- Bulk data export for analysis or compliance
- API access for integration with DataGuard internal systems
- Audit logs downloadable for compliance and security reviews

6.7 User Stories

US-ADMIN-001: As a DataGuard Operations Manager, I want to view all scheduled collections for tomorrow so that I can ensure adequate staffing and vehicle availability.

Acceptance Criteria:

- Operations dashboard includes "Tomorrow's Schedule" widget
- Widget shows total collections, by region/driver, by time slot
- Click widget to view detailed list with addresses and contact info
- Export to PDF or print for driver handouts
- Alert displayed if scheduling conflicts or capacity issues detected

US-ADMIN-002: As a DataGuard Finance Manager, I want to generate invoices for all clients at month-end so that billing is processed on time.

Acceptance Criteria:

- Billing module displays "Generate Invoices" button available on last day of month
- System calculates charges for all clients based on subscription + usage
- Preview invoices before final generation
- Approve batch of invoices with single action
- Invoices emailed to clients automatically upon approval

US-ADMIN-003: As a DataGuard Support Agent, I want to impersonate a client user to troubleshoot reported issues so that I can resolve problems quickly.

Acceptance Criteria:

- Client management page includes "Impersonate User" button (restricted to support role)
- Impersonation requires justification note and creates audit log entry
- Support agent views platform exactly as client would see it
- Prominent banner indicates impersonation mode
- "Exit Impersonation" button returns to admin console

US-ADMIN-004: As a DataGuard Executive, I want to view a real-time dashboard of key business metrics so that I can monitor company performance.

Acceptance Criteria:

- Executive dashboard accessible from main navigation
- Dashboard displays: total clients, MRR, total paper recycled, carbon credits generated, NPS score
- Each metric shows current value, trend arrow, and sparkline chart
- Dashboard auto-refreshes every 5 minutes
- Click metric for detailed drill-down report

References

[1] TraceX Technologies. (2026, January 20). DMRV for Carbon Credits: Building Trust in Carbon Markets. https://tracextech.com/dmrv-for-carbon-credits/

[2] World Bank. (2022, July 27). Climate Explainer: MRV (Measurement, Reporting, and Verification). https://www.worldbank.org/en/news/feature/2022/07/27/what-you-need-to-know-about-the-measurement-reporting-and-verification-mrv

[3] KnowESG. (2025, November 12). ESG SaaS Platforms: Driving Cloud-Based Sustainability. https://knowesg.com/finance-technology/esg-saas-platform-cloud-based-solutions-for-modern-sustainability-programs

[4] Carbmee. (2025, September 18). Carbon Accounting Software: Comprehensive Guide. https://www.carbmee.com/blog/carbon-accounting-software

[5] Watershed Climate Platform. Platform Overview and Features. https://watershed.com