CPFR Platform & Portal: Requirements & Solutioning

Document Type: Business Requirements & Explored Solutions
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Document Purpose

This document captures business requirements, success criteria, explored solutions, constraints, and risks for the CPFR Platform & Portal initiative. While explored solutions are referenced to demonstrate feasibility, requirements are defined independently of specific technical approaches.

Note: This document focuses on what must be achieved (requirements) and how it might be achieved (explored solutions). Problem statements and user needs are documented separately in the Problem Definition & User Stories document.

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Business Requirements

Functional Requirements

FR-1: Scale Requirements

- **REQ-1.1:** Support 3,000-5,000 concurrent vendor users and 200+ concurrent internal users (ISMs, analysts)
- **REQ-1.2:** Handle 6,600+ daily read operations without performance degradation
- **REQ-1.3:** Scale vendor capacity without proportional infrastructure or support overhead increase

FR-2: Data Consistency & Governance Requirements

- **REQ-2.1:** Provide daily, immutable data snapshots that eliminate time-of-day drift
- **REQ-2.2:** Ensure all stakeholders (internal and external) reference the same data version across all access methods (portal, email, direct queries)
- **REQ-2.3:** Provide definitive data lineage and audit trails for all data access

FR-3: Data Isolation & Security Requirements

- **REQ-3.1:** Enforce strict data isolation ensuring vendors access only their authorized SKUs, with complete access logging for security and compliance
- **REQ-3.2:** Support multi-vendor entities with separate vendor numbers and SKU groups
- **REQ-3.3:** Provide granular access controls for internal users (default scope with override capabilities)

FR-4: Analytical Depth Requirements

- **REQ-4.1:** Support multiple analytical depth levels (tier structure) as templates with customization capability, accommodating different vendor needs from high-level forecasts to granular SKU/fulfillment-center/region breakdowns
- **REQ-4.2:** Enable metric-level customization for high-touch vendor relationship

FR-5: Self-Service & Access Requirements

- **REQ-5.1:** Enable vendors to access CPFR data on-demand, 24/7, without ISM intervention, via multiple modalities (portal, email, direct queries) based on vendor preferences
- **REQ-5.2:** Enable vendors to manage contact information and notification preferences
- **REQ-5.3:** Enable ISMs to customize vendor data views and metric selections

FR-6: Historical Data & Analysis Requirements

- **REQ-6.1:** Maintain 2 years of historical CPFR data with daily granularity
- **REQ-6.2:** Enable time-series analysis, trend identification, and historical comparison for forecast accuracy validation

FR-7: Integration Requirements

- **REQ-7.1:** Integrate seamlessly with existing Chewy Partner Hub (CPH) infrastructure
- **REQ-7.2:** Provide data access compatible with existing internal tools (Tableau, Plotly, etc.) and API exposure for vendors who are not VDS tenants
- **REQ-7.3:** Maintain compatibility with existing VDS infrastructure (complementary, not replacement)
- **REQ-7.4:** Support future integration with Vendor Compliance (VC) data

FR-8: Data Refresh Requirements

- **REQ-8.1:** Refresh CPFR data daily during designated maintenance window (2-3 AM), completing refresh cycle within window to ensure availability by business hours
- **REQ-8.2:** Provide sequential refresh of dependent data structures (base tables → materialized views)

Non-Functional Requirements

NFR-1: Performance Requirements

- **REQ-N1.1:** Query response time <2 seconds for tier-specific vendor queries, <10 seconds for complex cross-vendor analytics
- **REQ-N1.2:** Support 200+ concurrent user sessions without performance degradation
- **REQ-N1.3:** System availability >99.5% during business hours

NFR-2: Data Governance Requirements

- **REQ-N2.1:** Provide standardized data definitions, lineage documentation, and audit capabilities for data access and modifications
- **REQ-N2.2:** Support change management process for data structure modifications
- **REQ-N2.3:** Enable centralized governance while maintaining team autonomy

NFR-3: Usability Requirements

- **REQ-N3.1:** Portal interface must be intuitive for vendors with varying technical capabilities
- **REQ-N3.2:** Data access must support multiple interface modalities (web portal, email) and provision future expansion for API, direct queries
- **REQ-N3.3:** Administrative tasks (contact management, preferences) must be self-service

NFR-4: Extensibility Requirements

- **REQ-N4.1:** Architecture must support future AI/ML-driven analytics initiatives and enable machine learning model training with normalized data cadence
- **REQ-N4.2:** Platform must support extension to other data types (e.g., VC data) and enable future enhancements without fundamental redesign

Explored Solutions (Feasibility Reference)

Note: This section documents explored solutions to demonstrate feasibility and inform requirements. These are not final solution decisions but represent technical approaches that have been evaluated to validate that requirements can be met.

Platform Architecture (Explored)

Hybrid Approach:

- **Semantic Layer + CPH Portal:** CPFR data with snapshot consistency requirements
- **Linked API Services (API is currently available in VDS):** Parallel CPFR API and VDS pulling from same semantic platform
- **Rationale:** Optimizes each data channel for its specific access patterns while maintaining architectural coherence

Core Structure:

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Daily ETL → Snowflake Raw Tables → Base Semantic Table (RLS) → Materialized Views → User Access
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Key Components:

- **Base Semantic Table:** Single logical table with physical partitioning, clustered by snapshot_date, vendor_id, tier_level
- **Row-Level Security (RLS):** Database-level security enforcing vendor isolation and ISM access controls
- **Materialized Views:** Performance optimization for common query patterns (Tier 1-4 structures)
- **Estimated Scale:** <1GB per daily snapshot, ~730GB for 2-year retention

Why This Approach:

- Addresses snapshot consistency requirement (daily immutable data)
- Scales to 3K+ vendors through RLS and materialized view architecture
- Provides definitive audit capabilities through database-level security
- Leverages existing Snowflake infrastructure and team expertise

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Portal Architecture (Explored)

CPH Integration:

- Vendor-facing interface within existing Chewy Partner Hub infrastructure
- Self-service capabilities for data access, contact management, notification preferences
- Secure 24/7 access with strict data isolation
- Email backup capability for vendors unable to access portal

Access Patterns:

- Portal access segregated from internal Chewy Team Member access
- Both portal and internal tools synchronize to same governed base tables
- Clear separation of access scopes while maintaining data consistency

Why This Approach:

- Leverages existing CPH infrastructure and Replen Tech resources
- Provides unified vendor experience across CPFR and VC capabilities
- Enables co-branded rollout with VC team
- Reduces infrastructure duplication

Enterprise Technology Alignment (Explored)

Snowflake & SQL-Based Approach:

- Enterprise-standard data warehouse platform with existing infrastructure and licensing
- Team expertise aligned with Snowflake capabilities
- Native support for RLS, materialized views, and time-based partitioning
- SQL-based approach aligns with existing team skills (ISM and BIE team core competency)
- Compatible with Snowflake's native capabilities and enables direct query access for advanced users

Why These Choices:

- Leverages existing enterprise investments and expertise
- Minimizes learning curve and implementation risk
- Aligns with Chewy's technology standardization strategy
- Provides proven scalability and performance characteristics

Constraints & Assumptions

Enterprise Technology Constraints

C-1: Snowflake & SQL Standardization

- **Constraint:** Enterprise has standardized on Snowflake as primary data warehouse platform; data warehouse operations are SQL-based by default
- **Implication:** Platform must leverage Snowflake infrastructure and capabilities, aligning with SQL-based access patterns
- **Rationale:** Aligns with enterprise technology strategy, existing investments, and team expertise

Organizational Constraints

C-2: VDS Complementarity

- **Constraint:** CPFR platform must complement, not replace, existing VDS infrastructure
- **Implication:** Architecture must integrate seamlessly without disrupting VDS operations
- **Rationale:** VDS serves distinct use cases and has established value; CPFR serves broader vendor cohort

C-3: CPH Integration Requirement

- **Constraint:** Portal must integrate into existing Chewy Partner Hub infrastructure
- **Implication:** Portal development must align with CPH architecture and Replen Tech resources
- **Rationale:** Leverages existing portal infrastructure and avoids duplication

Business Assumptions

A-1: Daily Snapshot Sufficiency

- **Assumption:** Daily immutable snapshots meet business needs for collaborative planning
- **Rationale:** Eliminates time-of-day drift and provides consistent data views for planning cycles
- **Validation:** Confirmed through business stakeholder discussions

A-2: Tier Structure Evolution

- **Assumption:** Tier structure serves as templates with customization capability, not rigid constraints
- **Rationale:** Different vendors need different analytical depth; high-touch vendors need metric-level customization
- **Validation:** Business requirement for flexibility while maintaining standardization

A-3: Historical Data Retention

- **Assumption:** 2 years of historical data with daily granularity meets analytical needs
- **Rationale:** Enables trend analysis and forecast accuracy validation
- **Validation:** Based on current analytical patterns and business feedback

Dependencies & Risks

Dependencies

D-1: Replen Tech Portal Development

- **Dependency:** CPFR portal integration requires Replen Tech engineering resources
- **Mitigation:** Joint roadmap and defined data contracts
- **Status:** Active collaboration in progress

D-2: EDS Security Approval

- **Dependency:** Portal and platform require EDS security review and approval
- **Mitigation:** Leverage existing Replen Tech EDS partnerships
- **Status:** Security review process initiated

D-3: Data Source Availability

- **Dependency:** Platform requires reliable, timely data sources for daily refresh
- **Mitigation:** Leverage existing ETL processes and data sources
- **Status:** Data sources identified and validated

D-4: Vendor Adoption

- **Dependency:** Success requires vendor adoption of portal and self-service capabilities
- **Mitigation:** Co-branded rollout with VC, vendor education, and support
- **Status:** Communication and transition planning in progress

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Risks

R-1: Data Consistency & Inter-Team Alignment

- **Risk:** Potential for data inconsistencies if governance processes are not maintained; misalignment between CPFR, Replen Tech, and VC teams could delay implementation
- **Mitigation:** Centralized governance, shared change-management process, single source of truth architecture, defined data contracts, joint roadmap, regular alignment meetings
- **Probability:** Medium (data consistency), Low (inter-team alignment)
- **Impact:** High

R-2: Vendor Adoption Challenges

- **Risk:** Vendors may not adopt portal, limiting self-service benefits
- **Mitigation:** Co-branded rollout, vendor education, email backup option, gradual onboarding
- **Probability:** Medium
- **Impact:** Medium

R-3: Platform Sustainment

- **Risk:** Long-term platform maintenance may not be adequately resourced
- **Mitigation:** Clear ownership by Supply Chain B.I. team, ongoing Replen Tech and EDS support
- **Probability:** Low
- **Impact:** Medium

R-4: Performance at Scale

- **Risk:** Platform performance may degrade with 3,000+ concurrent users
- **Mitigation:** Materialized view architecture, RLS optimization, performance testing, monitoring
- **Probability:** Low
- **Impact:** High

Document Maintenance

This document should be updated as:

- Requirements are refined through stakeholder feedback
- New constraints or dependencies are identified
- Explored solutions evolve or are finalized

Maintenance Principles:

- Preserve requirements even as solutions evolve
- Clearly distinguish between requirements and explored solutions
- Update “Last Updated” date with each significant change