UOS Product Classification Standard (UPCS)

Purpose

UPCS is the UOS standard for **classifying grocery products** across retailers in a consistent way. It is designed for:

- E-commerce navigation
- Picking efficiency (via separate location modelling)
- Substitution logic
- Cross-retailer analytics

UPCS is **loosely aligned to GS1 principles**, but intentionally simpler and easier to adopt.

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1. Taxonomy Model (Commercial)

Levels

- `uos_department`
- `uos_category`
- `uos_subcategory`
- `uos_category_id` (immutable)

Rule: every SKU maps to exactly **one** `uos_category_id`.

Why shallow?

Deep trees hurt mobile browsing and increase mapping effort. UPCS stays shallow and pushes detail into attributes.

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2. Attribute Model (Metadata)

Dietary, brand, and merchandising concepts MUST be captured as attributes (multi-tag), not as categories:

- vegan, gluten-free, halal
- organic
- price tier
- pack size
- "high protein", etc.

(Keep your existing attribute schema; extend it freely without changing the core taxonomy.)

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3. Operational Picking Model (Separate from Taxonomy)

Picking is driven by **where the item is**, not what it "is". Use store-specific location fields and route sequencing.

See: `uos_sku_picking_location_template.csv`

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4. Substitution Model

Substitution should be scored using weighted similarity features with hard constraints.

Hard constraints (typical defaults)

- Temperature zone must match (Ambient/Chilled/Frozen)
- If dietary flags are set on the original, substitutes must honour them
- Pack size and price deltas bounded by policy thresholds

See:

- `uos_substitution_weights.csv`
- `uos_substitution_constraints.csv`
- `uos_substitution_scoring_example.csv`

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5. Versioning & Governance

UPCS is governed as a standard:

- Category IDs are permanent
- Names may change
- Deprecations must be managed with migration plans
- Releases are versioned (semver recommended)

See:

- `upcs_versions.csv`
- `upcs_change_request_template.csv`
- `CHANGELOG.md`

6. Automated Classification (Rules-first starter)

UPCS supports rules-based classification to reduce manual workload. Start rules-first (explainable), then evolve to ML once you have enough labelled data.

See:

- `upcs_nlp_classification_rules.csv`
- `README_NLP_RULES.md`

Included Files

- `uos_production_taxonomy_v2.csv` — UPCS taxonomy (production starter)
- `uos_picking_zone_schema.csv` — picking zone schema
- `uos_sku_picking_location_template.csv` — store SKU location mapping template
- `uos_substitution_weights.csv` — substitution feature weights
- `uos_substitution_constraints.csv` — substitution guardrails
- `uos_substitution_scoring_example.csv` — example scoring rows
- `upcs_versions.csv` — version registry
- `upcs_change_request_template.csv` — governance workflow template
- `CHANGELOG.md` — changelog scaffold
- `upcs_nlp_classification_rules.csv` — starter NLP rules
- `README_NLP_RULES.md` — how to use the NLP rules

Adoption Pitch (Retailers)

Retailers do NOT have to replace their internal taxonomy. They only need to provide a mapping from their internal categories to UPCS IDs.

UPCS provides:

- Standardised ordering and integration
- Consistent substitution behaviour
- Comparable analytics across retailers
- Faster onboarding for new retailers