

# CloudAxis Inc.

## Data Dictionary & Model Reference

ASC 606 Revenue Recognition · SaaS Portfolio Project · 2023–2024

|                                      |                                          |                                        |                                    |
|--------------------------------------|------------------------------------------|----------------------------------------|------------------------------------|
| <b>3 source files</b><br>Input layer | <b>61 contracts</b><br>948 activity rows | <b>12 engine steps</b><br>ASC 606 loop | <b>8 metric outputs</b><br>Phase 3 |
|--------------------------------------|------------------------------------------|----------------------------------------|------------------------------------|

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# 1. contracts.csv

Primary reference table. One row per contract. 61 rows × 34 columns. Generated by generate\_cloudaxis\_50.py. Contains all contract terms, pricing, modification flags, and policy classifications.

| Column                | Type    | Null? | Description                                                                        | Values / Notes                            | Source    |
|-----------------------|---------|-------|------------------------------------------------------------------------------------|-------------------------------------------|-----------|
| contract_id           | STRING  | N     | Primary key. Unique contract identifier.                                           | CTR-0001 to CTR-0061                      | Generated |
| customer_id           | STRING  | N     | Customer identifier. Multiple contracts can share one customer.                    | CUST-0001 to CUST-0050                    | Generated |
| customer_segment      | STRING  | N     | Commercial segment. Drives commission rate and expected life.                      | SMB   Mid-Market   Enterprise             | Generated |
| region                | STRING  | N     | Geographic region of customer billing address.                                     | North America   EMEA   APAC   LATAM       | Generated |
| product               | STRING  | N     | Product line. Determines recognition pattern.                                      | Core   Analytics   DataPipeline           | Generated |
| pricing_model         | STRING  | N     | Pricing structure of the contract.                                                 | per_seat_annual   flat_rate   usage_based | Generated |
| contract_start_date   | DATE    | N     | First day of contract term (including any free trial).                             | YYYY-MM-DD                                | Generated |
| contract_end_date     | DATE    | Y     | Last day of contracted term. Null for month-to-month.                              | YYYY-MM-DD   null (m2m)                   | Generated |
| contract_tcv          | DECIMAL | N     | Total Contract Value. Sum of all committed MRR over term plus impl fee.            | USD, 2dp                                  | Computed  |
| base_mrr              | DECIMAL | N     | Monthly Recurring Revenue at contract inception before modifications.              | USD, 2dp                                  | Generated |
| seats_contracted      | INTEGER | Y     | Number of seats at signing. Core product only. Null for Analytics/DataPipeline.    | Positive integer   null                   | Generated |
| price_per_seat        | DECIMAL | Y     | Price per seat at contract signing. LOCKED — used for all seat add calculations.   | USD, 2dp   null                           | Generated |
| usage_base_fee        | DECIMAL | Y     | Fixed monthly base fee for DataPipeline. Null for Core/Analytics.                  | USD, 2dp   null                           | Generated |
| overage_rate_per_unit | DECIMAL | Y     | Per-unit rate for DataPipeline usage above included tier. Null for Core/Analytics. | USD, 4dp   null                           | Generated |
| usage_tier_included   | DECIMAL | Y     | Monthly unit threshold before overage charges apply. DataPipeline only.            | Units   null                              | Generated |

| Column                                     | Type    | Null? | Description                                                                                          | Values / Notes                                                    | Source     |
|--------------------------------------------|---------|-------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|------------|
| <code>free_trial_months</code>             | INTEGER | N     | Number of months before first billing. Zero if no trial.                                             | 0   1   2   3                                                     | Generated  |
| <code>has_impl_fee</code>                  | BOOLEAN | N     | Whether contract includes a non-distinct implementation fee.                                         | True   False                                                      | Generated  |
| <code>impl_fee_amount</code>               | DECIMAL | N     | Total implementation fee. Zero if <code>has_impl_fee=False</code> . Recognised ratably.              | USD, 2dp                                                          | Generated  |
| <code>is_multi_element</code>              | BOOLEAN | N     | Whether contract is part of a bundle (Core + Analytics). Requires SSP allocation.                    | True   False                                                      | Generated  |
| <code>bundle_contract_id</code>            | STRING  | Y     | Partner contract in a bundle arrangement. Null if solo contract.                                     | CTR-XXXX   null                                                   | Generated  |
| <code>payment_terms</code>                 | STRING  | N     | Billing and payment structure.                                                                       | annual_upfront   annual_quarterly   monthly                       | Generated  |
| <code>sales_commission_pct_new</code>      | DECIMAL | N     | Commission rate on TCV for new business. Applied to <code>orig_commission_capitalized</code> .       | 0.10 (SMB)   0.12 (MM)   0.15 (ENT)                               | Generated  |
| <code>sales_commission_pct_upgrade</code>  | DECIMAL | N     | Legacy field. Prospective treatment now uses the same rate as new business.                          | 0.05 (legacy, not used in final engine)                           | Deprecated |
| <code>ssp_amount</code>                    | DECIMAL | N     | Standalone Selling Price used for bundle allocation. Equals <code>base_mrr</code> for solo.          | USD, 2dp   $\text{base\_mrr} \times 1.10\text{-}1.20$ for bundles | Generated  |
| <code>cohort_month</code>                  | STRING  | N     | First paying month. Offset from <code>contract_start_date</code> by <code>free_trial_months</code> . | YYYY-MM                                                           | Computed   |
| <code>is_committed_term</code>             | BOOLEAN | N     | Whether the contract has a fixed end date. Determines RPO inclusion.                                 | True   False                                                      | Generated  |
| <code>expected_customer_life_months</code> | INTEGER | N     | Expected life for commission amortisation. Set by segment.                                           | 18 (SMB)   24 (MM)   36 (ENT)                                     | Policy     |
| <code>renewal_type</code>                  | STRING  | Y     | Outcome at contract expiry. Null if contract still active at Dec 2024.                               | renewed   churned_at_renewal   null                               | Generated  |
| <code>modification_type</code>             | STRING  | Y     | Type of contract modification. Null if unmodified.                                                   | product_switch   null                                             | Generated  |
| <code>asc606_modification_treatment</code> | STRING  | Y     | ASC 606 modification accounting approach applied.                                                    | prospective   null                                                | Policy     |
| <code>modified_from_contract_id</code>     | STRING  | Y     | Source contract for <code>product_switch_in</code> contracts.                                        | CTR-XXXX   null                                                   | Generated  |
| <code>termination_date</code>              | DATE    | Y     | Date of early termination. Null if not terminated.                                                   | YYYY-MM-DD   null                                                 | Generated  |

| Column                     | Type    | Null? | Description                                                   | Values / Notes                                                   | Source    |
|----------------------------|---------|-------|---------------------------------------------------------------|------------------------------------------------------------------|-----------|
| termination_type           | STRING  | Y     | Early termination treatment.                                  | early_with_penalty   early_with_refund   early_no_penalty   null | Generated |
| termination_penalty_amount | DECIMAL | Y     | Cash penalty recognised as additional revenue on termination. | USD, 2dp   null                                                  | Generated |

## 2. monthly\_activity.csv

Transaction-level activity table. One row per contract per active month. 948 rows × 25 columns. Generated by generate\_cloudaxis\_50.py alongside contracts.csv. Contains billing, MRR movement, commission events, and modification events.

| Column                 | Type    | Null? | Description                                                                       | Values / Notes                                                                                                       | Source     |
|------------------------|---------|-------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------|
| contract_id            | STRING  | N     | Foreign key to contracts.csv.                                                     | CTR-0001 to CTR-0061                                                                                                 | FK         |
| customer_id            | STRING  | N     | Foreign key. Denormalised for aggregation convenience.                            | CUST-0001 to CUST-0050                                                                                               | FK         |
| period_month           | STRING  | N     | Month of this row. One row per contract per active month.                         | YYYY-MM (2023-01 to 2024-12)                                                                                         | Generated  |
| seats_active           | DECIMAL | Y     | Seats active this month after any seat additions. Core only. Null for others.     | Positive integer   null                                                                                              | Generated  |
| usage_units_consumed   | DECIMAL | Y     | Total units consumed this month. DataPipeline only.                               | Units, 1dp   null                                                                                                    | Generated  |
| usage_tier_included    | DECIMAL | Y     | Included tier this month (denormalised from contracts). DataPipeline only.        | Units   null                                                                                                         | Denorm     |
| overage_units          | DECIMAL | Y     | Units above included tier. DataPipeline only. max(0, consumed - tier).            | Units, 1dp   null                                                                                                    | Computed   |
| overage_revenue        | DECIMAL | Y     | Overage revenue this month = overage_units × rate. DataPipeline only.             | USD, 2dp   null                                                                                                      | Computed   |
| mrr_this_month         | DECIMAL | N     | Current MRR after all modifications applied this month. Used as recognition base. | USD, 2dp                                                                                                             | Computed   |
| amount_billed          | DECIMAL | N     | Cash invoiced this month. Pattern depends on payment_terms and product.           | USD, 2dp   0 for non-billing months                                                                                  | Computed   |
| is_in_trial            | BOOLEAN | N     | Whether this month is a free trial month. Revenue = 0 when True.                  | True   False                                                                                                         | Computed   |
| modification_event     | STRING  | Y     | Type of modification event in this month. Null if no event.                       | seat_add   tier_upgrade   tier_downgrade   product_switch_in   product_switch_out   churn   early_termination   null | Generated  |
| modification_delta_mrr | DECIMAL | Y     | MRR change from modification. Positive=expansion, negative=contraction.           | USD, 2dp   null                                                                                                      | Computed   |
| mrr_movement_type      | STRING  | Y     | MRR cohort movement category for waterfall analysis.                              | new   expansion   contraction   churned   reactivation   null                                                        | Classified |

| Column                                             | Type        | Nul<br>l? | Description                                                                                                 | Values / Notes                                                                                                 | Sou<br>rce         |
|----------------------------------------------------|-------------|-----------|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------|
| <code>impl_fee_re<br/>cognized</code>              | DECI<br>MAL | Y         | Impl fee revenue component<br>this month = <code>impl_fee_amount</code> /<br><code>contract_months</code> . | USD, 2dp   null (no impl fee)                                                                                  | Com<br>pute<br>d   |
| <code>orig_asset_<br/>id</code>                    | STRI<br>NG  | Y         | Identifier of the original<br>commission asset for this<br>contract.                                        | ASSET-XXXXX   null                                                                                             | Gen<br>erate<br>d  |
| <code>orig_commis<br/>sion_capita<br/>lized</code> | DECI<br>MAL | Y         | Original commission capitalised<br>at contract signing. Non-zero in<br>month 1 only.                        | USD, 2dp   null (not month 1)                                                                                  | Com<br>pute<br>d   |
| <code>orig_commis<br/>sion_amorti<br/>zed</code>   | DECI<br>MAL | Y         | Original commission amortised<br>this month (monthly<br>straight-line).                                     | USD, 2dp   null                                                                                                | Com<br>pute<br>d   |
| <code>orig_commis<br/>sion_asset_<br/>bal</code>   | DECI<br>MAL | Y         | Closing balance of original<br>commission asset after<br>amortisation.                                      | USD, 2dp   null                                                                                                | Com<br>pute<br>d   |
| <code>exp_asset_<br/>id</code>                     | STRI<br>NG  | Y         | Identifier of expansion<br>commission asset (seat add or<br>upgrade). Null if none.                         | ASSET-XXXXX   null                                                                                             | Gen<br>erate<br>d  |
| <code>exp_commiss<br/>ion_capital<br/>ized</code>  | DECI<br>MAL | Y         | Expansion commission<br>capitalised at expansion event<br>month. Non-zero in event<br>month only.           | USD, 2dp   null                                                                                                | Com<br>pute<br>d   |
| <code>exp_commiss<br/>ion_amortiz<br/>ed</code>    | DECI<br>MAL | Y         | Expansion commission<br>amortised this month.                                                               | USD, 2dp   null                                                                                                | Com<br>pute<br>d   |
| <code>exp_commiss<br/>ion_asset_b<br/>al</code>    | DECI<br>MAL | Y         | Closing balance of expansion<br>commission asset.                                                           | USD, 2dp   null                                                                                                | Com<br>pute<br>d   |
| <code>commission_<br/>event_type</code>            | STRI<br>NG  | Y         | Type of commission event this<br>month.                                                                     | <code>original_asset_created</code>  <br><code>expansion_asset_created</code>  <br>null                        | Clas<br>sifie<br>d |
| <code>churn_reaso<br/>n</code>                     | STRI<br>NG  | Y         | Reason for churn. Populated on<br>churn/termination month only.                                             | <code>price</code>   <code>competitor</code>  <br><code>end_of_need</code>   <code>no_renewal</code>  <br>null | Gen<br>erate<br>d  |

### 3. recognition\_schedule.csv

ASC 606 recognition output. One row per contract per active month. 948 rows × 12 columns. Generated by recognition\_engine\_fixed.py. Source for all Phase 3 metrics and the ASC 606 disclosure package.

| Column                     | Type    | Nul<br>l? | Description                                                                                                                                            | Values / Notes                                                                                                  | Source   |
|----------------------------|---------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------|
| contract_id                | STRING  | N         | Foreign key to contracts.csv.                                                                                                                          | CTR-0001 to CTR-0061                                                                                            | FK       |
| period_month               | STRING  | N         | Recognition period. One row per contract per active month.                                                                                             | YYYY-MM                                                                                                         | FK       |
| revenue_recognized         | DECIMAL | N         | Revenue recognised this month. Includes subscription + impl_fee portion. Zero during trial.                                                            | USD, 2dp   ≥ 0                                                                                                  | Engine   |
| deferred_rev_balance       | DECIMAL | N         | Closing deferred revenue balance. $\max(0, \text{cum\_billed} \times \text{ratio} - \text{cum\_recognised})$ . Mutually exclusive with contract_asset. | USD, 2dp   ≥ 0                                                                                                  | Engine   |
| contract_asset_balance     | DECIMAL | N         | Closing contract asset balance. $\max(0, \text{cum\_recognised} - \text{cum\_billed} \times \text{ratio})$ . Mutually exclusive with deferred.         | USD, 2dp   ≥ 0                                                                                                  | Engine   |
| catchup_adjustment         | DECIMAL | N         | Cumulative catch-up adjustment. Always 0 — all modifications are prospective.                                                                          | Always 0.00 in final model                                                                                      | Engine   |
| rpo_remaining              | DECIMAL | Y         | Remaining Performance Obligation = $\text{current\_mrr} \times \text{months\_remaining}$ . Null for month-to-month and DataPipeline overages.          | USD, 2dp   null                                                                                                 | Engine   |
| orig_commission_asset_bal  | DECIMAL | N         | Closing balance of original commission asset at period end.                                                                                            | USD, 2dp   ≥ 0                                                                                                  | Engine   |
| exp_commission_asset_bal   | DECIMAL | N         | Closing balance of expansion commission asset at period end.                                                                                           | USD, 2dp   ≥ 0                                                                                                  | Engine   |
| total_commission_asset_bal | DECIMAL | N         | Sum of orig + exp commission asset balances. Reported on balance sheet.                                                                                | USD, 2dp   ≥ 0                                                                                                  | Computed |
| cumulative_recognized      | DECIMAL | N         | Running total of revenue recognised for this contract from inception.                                                                                  | USD, 2dp   ≥ 0                                                                                                  | Engine   |
| note                       | STRING  | Y         | Descriptive note for special period events.                                                                                                            | trial_period   seat_add   tier_upgrade   tier_downgrade   product_switch_out   early_termination   churn   null | Engine   |



## 4. Key Accounting Assumptions

All accounting policy decisions applied in the recognition engine and disclosure package. Each was determined by an accounting professional and then executed by the engine. AI did not make any of these decisions independently.

| Decision / Assumption                         | Treatment Applied                                          | ASC Reference      | Category           |
|-----------------------------------------------|------------------------------------------------------------|--------------------|--------------------|
| <b>Prospective modification treatment</b>     | All contract types — upgrades and downgrades               | ASC 606-10-25-12   | ASC 606 / 340-40   |
| <b>Implementation fees — not distinct</b>     | Combined with subscription, ratable over term              | ASC 606-10-25-19   | ASC 606 / 340-40   |
| <b>Renewal options — not a material right</b> | Renewals priced at market rates, no price advantage        | ASC 606-10-55-42   | ASC 606 / 340-40   |
| <b>DataPipeline variable overages</b>         | Excluded from RPO under practical expedient                | ASC 606-10-50-14   | ASC 606 / 340-40   |
| <b>Month-to-month contracts</b>               | Excluded from RPO — no enforceable future right            | ASC 606-10-50-13   | ASC 606 / 340-40   |
| <b>Bundle SSP allocation</b>                  | Solo = base_mrr; Bundle = base_mrr × 1.10-1.20             | ASC 606-10-32-31   | ASC 606 / 340-40   |
| <b>Commission asset amortisation</b>          | Straight-line over expected life: 18/24/36 months          | ASC 340-40-35-1    | ASC 606 / 340-40   |
| <b>Commission write-off on termination</b>    | Immediate expense of unamortised balance                   | ASC 340-40-35-1    | ASC 606 / 340-40   |
| <b>LTV churn methodology</b>                  | Trailing 12-month MRR average, 6% annual floor, 5-year cap | Finance convention | Finance / Business |
| <b>CAC calculation</b>                        | Commission CAC ÷ 0.35 (commissions ≈ 35% of S&M costs)     | Finance convention | Finance / Business |
| <b>DataPipeline billing</b>                   | Always monthly regardless of payment_terms commitment      | Business rule      | Finance / Business |
| <b>Price per seat — locked</b>                | Seat additions use original contracted PPS, not repriced   | Business rule      | Finance / Business |

## 5. Python Script Reference

### **generate\_cloudaxis\_50.py**

Depends on: Run first — no dependencies

50 customers, 61 contracts, all edge cases. Outputs contracts.csv and monthly\_activity.csv. Designed so every modification type, payment term, segment, product, and special feature (trial, impl fee, bundle, termination, renewal) appears at least once.

### **recognition\_engine\_fixed.py**

Depends on: Reads contracts.csv + monthly\_activity.csv

8-step ASC 606 recognition loop per contract per month. Outputs recognition\_schedule.csv. All 12 validation checks pass. Key fixes: DataPipeline excluded from annual\_upfront billing guard; tier\_upgrade and tier\_downgrade always prospective; commission write-off on early termination.

### **phase3\_metrics.py**

Depends on: Reads all 3 source files

Produces 8 metric CSV files. LTV uses a trailing 12-month churn rate with 6% annual floor and 5-year cap. CAC adjusted to full S&M cost (commission ÷ 0.35). MRR growth reported from a stable baseline (April 2023, 16+ customers).

### **build\_disclosure\_pdf.py**

Depends on: Reads 3 source files + 8 metric CSVs

8-page ASC 606 disclosure PDF using reportlab. Notes 1–6. Corrected roll-forward format (additions vs releases, not gross billings). Commission write-offs shown as separate columns. Geography disaggregation included.

### **build\_carousel\_v2.py**

Depends on: Standalone — uses hardcoded final numbers

6-slide LinkedIn carousel PDF. Light theme slides 2–5, dark for slides 1 and 6. Real data from the project. Rebuild if underlying numbers change.

## 6. Metrics Output Reference

Output files from phase3\_metrics.py. All consumed by the Excel model and dashboard.

| File                                            | Rows | Key Columns                                                                                                                     | Description                                                                                                                          |
|-------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <code>metrics_mrr_waterfall.csv</code>          | 24   | <code>new_mrr,</code><br><code>expansion_mrr,</code><br><code>churned_mrr,</code><br><code>net_new_mrr,</code> <code>arr</code> | Monthly MRR movement across all 5 categories. Includes <code>growth_from_baseline_pct</code> (vs April 2023 stable base).            |
| <code>metrics_nrr_grr.csv</code>                | 12   | <code>nrr_pct,</code> <code>grr_pct,</code><br><code>starting_mrr</code>                                                        | Rolling 12-month NRR and GRR. Available from Jan 2024 (requires 12-month lookback).                                                  |
| <code>metrics_cohort_retention.csv</code>       | 256  | <code>cohort_month,</code><br><code>months_since,</code><br><code>retention_pct</code>                                          | Cohort MRR retention. Rows per cohort per period. Used for heatmap and line chart.                                                   |
| <code>metrics_ltv_cac.csv</code>                | 122  | <code>ltv,</code> <code>cac,</code><br><code>ltv_cac_ratio,</code><br><code>payback_months</code>                               | LTV:CAC by segment per month. LTV: trailing 12-mo churn, 6% floor, 5yr cap. CAC: full S&M adjusted.                                  |
| <code>metrics_billings_vs_revenue.csv</code>    | 24   | <code>billings,</code><br><code>revenue_recognized,</code><br><code>deferred_balance,</code><br><code>contract_asset</code>     | Monthly ASC 606 bridge. Billings vs recognised. Closing deferred and contract asset balances.                                        |
| <code>metrics_deferred_rollforward.csv</code>   | 24   | <code>opening,</code> <code>billings,</code><br><code>recognized,</code> <code>closing</code>                                   | Monthly deferred revenue roll-forward. Note: billings here = gross billed, not additions-only. Use disclosure PDF for correct split. |
| <code>metrics_rpo.csv</code>                    | 72   | <code>product,</code> <code>rpo_total</code>                                                                                    | RPO by product per month. 3 products × 24 periods. Excludes m2m and variable consideration.                                          |
| <code>metrics_commission_rollforward.csv</code> | 24   | <code>opening,</code><br><code>new_capitalized,</code><br><code>amortized,</code><br><code>closing_balance</code>               | Monthly commission asset roll-forward. Write-offs embedded in closing balance — use disclosure PDF for full disclosure.              |