

Findings and Management Recommendations

Monthly Close and Cost-Centre Controlling Database | Alpenkante Systemtechnik GmbH (fictional) | reporting month Sep 2026 | prepared by Kleivin Gjuzi

Synthetic data. Alpenkante Systemtechnik GmbH is a fictional company. Every journal, budget, vendor, user name and amount in this project was produced by a seeded generator (seed 4711). No figure describes a real business. The account plan is illustrative and is not a legally compliant Austrian chart of accounts; the database is a stand-alone DuckDB file and is not connected to SAP or any other ERP system.

1. Executive summary and business questions

This report is the management summary of a controlling database built in DuckDB 1.4.5. The database holds 43,807 journal lines in 16,698 journals over 24 months (October 2024 to Sep 2026), a monthly budget by cost centre and account, allocation rules for shared costs and 11 automated close checks. The figures below are the output of the SQL in this project for the year to date (January to September 2026); Sep 2026 is the month currently being closed.

Business questions. (1) Is the company on budget, and if not, which departments, cost centres and accounts explain the gap? (2) What does each operating department contribute before and after shared costs are allocated? (3) Is the ledger ready to be closed for the month, and which items must be cleared first?

Key figure (EUR)	Actual YTD 2026	Budget YTD 2026	Variance	Variance %	Actual YTD 2025
Revenue	39,393,071	39,721,100	-328,029 U	-0.8%	37,904,420
Operating result (Betriebsergebnis)	2,559,337	3,530,700	-971,363 U	-27.5%	2,889,182
Net result	2,404,253	3,375,900	-971,647 U	-28.8%	2,735,684
Operating margin	6.5%	8.9%	-2.4 pts		7.6%
Rolling 12 months: revenue / operating margin	52,082,860 / 4.8%				

F = favourable, U = unfavourable. Variance = actual minus budget in management sign (revenue positive, cost negative), so a negative variance always lowers profit.

Answer in brief.

- The net result of EUR 2.40m is EUR 0.97m (28.8%) below budget. Revenue is only 0.8% short; about two thirds of the gap (EUR 0.64m) is cost, almost all of it in other operating expenses (EUR -578k, -12.4%).
- Building Systems explains the revenue shortfall: EUR 1.18m (9.1%) below budget, below budget in every month of 2026. After shared-cost allocation its contribution is EUR -483k. Industrial Components is EUR 492k ahead of budget and carries the company.
- Two cost blocks have no budget at all: ERP consulting in IT (EUR 228k) and the new Quality and Compliance cost centre (EUR 262k), which also has no allocation driver.
- The Sep 2026 ledger is not ready to close: 1 unbalanced journal (EUR 1,250.00), 3 cost lines without a cost centre (EUR 13,274.18) and EUR 40,370.68 of shared cost that cannot be allocated.

2. Data provenance and limitations

Label	What it covers in this project	Where it comes from
Synthetic	All master data, journals, budgets, allocation drivers, user and vendor identifiers	generator/generate_data.py, fixed seed 4711; identical files on every run
Derived	Every reported figure: P&L, variances, YTD and rolling values, allocations, contributions, exception lists	SQL views and analysis queries on the synthetic postings
Analyst assumption	Thresholds of the close checks (45 days for late invoices, EUR 5,000 for actuals without budget, 3-day window for possible duplicates, EUR 1,000 minimum budget for a percentage variance); the choice of allocation drivers	close_checks, sql/03_views.sql; tested in section 6

Label	What it covers in this project	Where it comes from
Real-world reference	Only two facts are borrowed from reality to make documents look plausible: the Austrian standard VAT rate of 20% and the custom of 13th and 14th monthly salaries. The employer on-cost rate of 30% is an illustrative assumption, not a statutory rate.	Source_Register.csv
Reported actuals	None. No published company figure is used anywhere.	-

Limitations. The data is cleaner than a real ledger: amounts are random, so there are no natural near-duplicates or recurring fixed invoices that would create false alarms; there is one company, one currency (EUR) and no intercompany, inventory or tax logic. The planted exceptions prove that the checks find what they are designed to find, not how many real problems they would miss. Budgets and business events (a weak division, a trade fair, an energy price spike) were written into the generator on purpose, so the findings demonstrate the analysis method, not a business reality.

3. KPI definitions and methodology

KPI	Definition	Where calculated
Management amount	credit minus debit on P&L accounts. Revenue is positive, cost is negative. Balance-sheet lines carry no management amount.	v_gl_lines.amount_mgmt
Operating result (Betriebsergebnis)	Sum of P&L lines 1 to 5 (revenue, materials, personnel, depreciation, other operating expenses).	A01, A03b
Net result	Operating result plus financial result (interest). No income tax is modelled.	A01, A04b
Variance and variance %	actual minus budget; % = variance / absolute budget. The % is left empty when the absolute budget is below EUR 1,000 (avoids division by zero and absurd percentages).	v_actual_vs_budget, A02
YTD (kumuliert)	Running total from January of the fiscal year to the period (fiscal year = calendar year).	A03a (window function)
Rolling 3 and 12 months	Sum of the current and the previous 2 or 11 periods; shown only when the full window exists.	A03b
Contribution before allocation	Department revenue minus the costs posted on the department's own cost centres.	v_department_contribution
Contribution after allocation	Contribution before allocation minus the department's share of shared-service costs (Umlage).	v_department_contribution, A04a/b
Allocation share	Driver value of the receiving department / sum of driver values of the sending cost centre for the year.	v_allocation_shares, A11a
Unallocated amount	Cost on a shared cost centre that has no driver for the year. Shown as its own line, never spread silently.	v_exc_unallocated_shared_cost
Exception	A posting or balance that breaks a close-check rule. An exception is an item to review; most have ordinary explanations.	v_exceptions_all, close_check_results

Method. Original postings in journal_lines are never changed. All reporting logic sits in 22 views; 17 analysis queries read the views and write result files. Allocations are calculated in a view (pool x share) and shown next to the original figures. 62 automated tests reconcile every report total back to the source postings.

4. Findings

Finding 1: the result is 28.8% below budget, and the gap is mainly cost, not revenue

Year to date the net result is EUR 2,404,253 against a budget of EUR 3,375,900: EUR 971,647 unfavourable. Revenue contributes EUR 328,029 of the shortfall (0.8% below budget, but 3.9% above the same months of 2025). Costs contribute EUR 643,618. Other operating expenses are EUR 578,468 over budget (12.4%); materials and personnel are within 0.2% of budget and depreciation is EUR 57,600 over because of a machine that went into use in production in January. Compared with 2025, the net result is EUR 331,431 lower although revenue is higher.

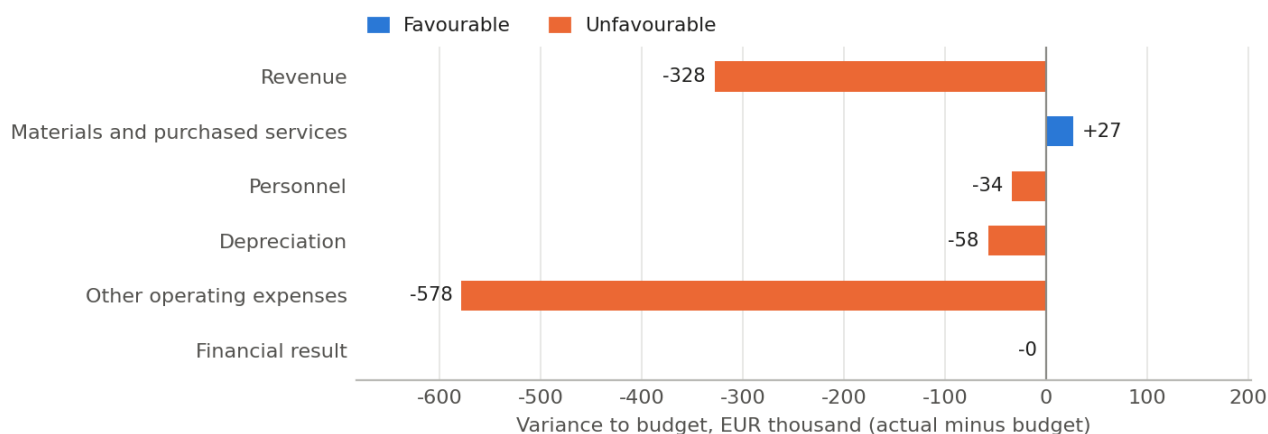


Chart 1: variance to budget by P&L line, January to September 2026. Source: results/A02_actual_vs_budget.csv. Synthetic data.

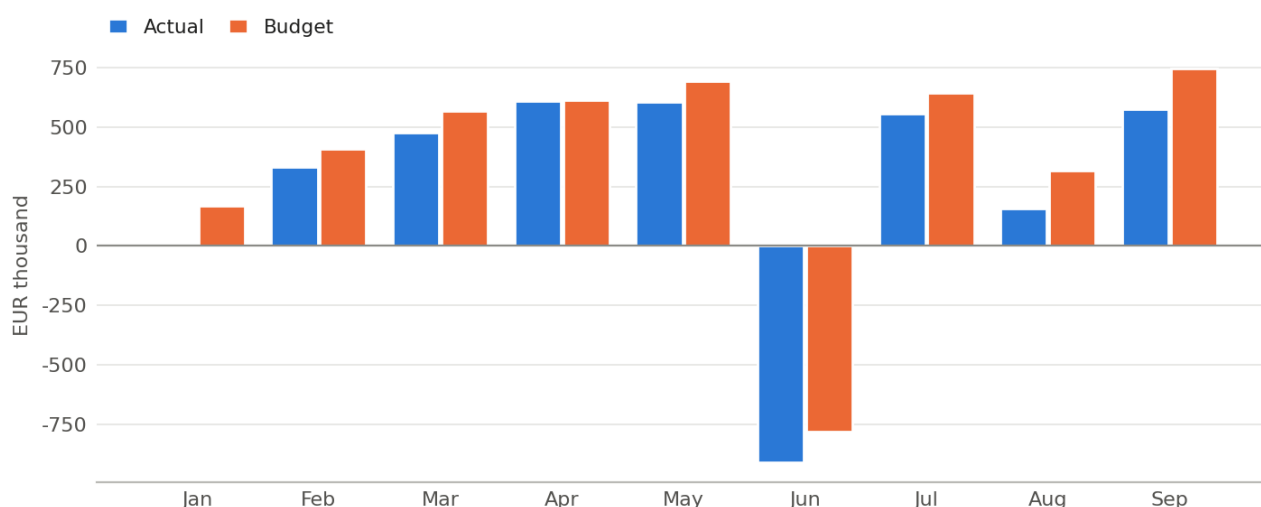


Chart 2: monthly net result against budget, 2026. June carries the 14th salary (double payroll), which the budget also contains. Source: v_actual_vs_budget.

Finding 2: Building Systems is the weak department; Industrial Components compensates part of it

Department (EUR, YTD)	Revenue	Revenue vs budget	Contribution before allocation	vs budget	Allocated shared costs	Contribution after allocation	Margin after
Industrial Components	21,603,421	+838,421 (+4.0%)	5,621,068	+492,268 F	-2,406,560	3,214,509	14.9%
Building Systems	11,871,010	-1,183,390 (-9.1%)	1,125,624	-800,976 U	-1,608,766	-483,142	-4.1%
Service and Maintenance	5,918,639	+16,939 (+0.3%)	1,138,336	-90,664 U	-1,000,536	137,801	2.3%

Building Systems revenue is EUR 1,183,390 below budget and was below budget in each of the 9 months. Because part of its cost base is fixed, the contribution before allocation of EUR 1,125,624 is EUR 800,976 below budget. After EUR 1,608,766 of allocated shared costs the department shows EUR -483,142 (margin -4.1%); in the same months of 2025 it was EUR 108,817. Industrial Components is EUR 492,268 ahead of its budget, driven by EUR 838,421 more revenue. Service and Maintenance is EUR 90,664 behind, mainly spare-part costs on CC3300 (EUR 102,236 over budget).

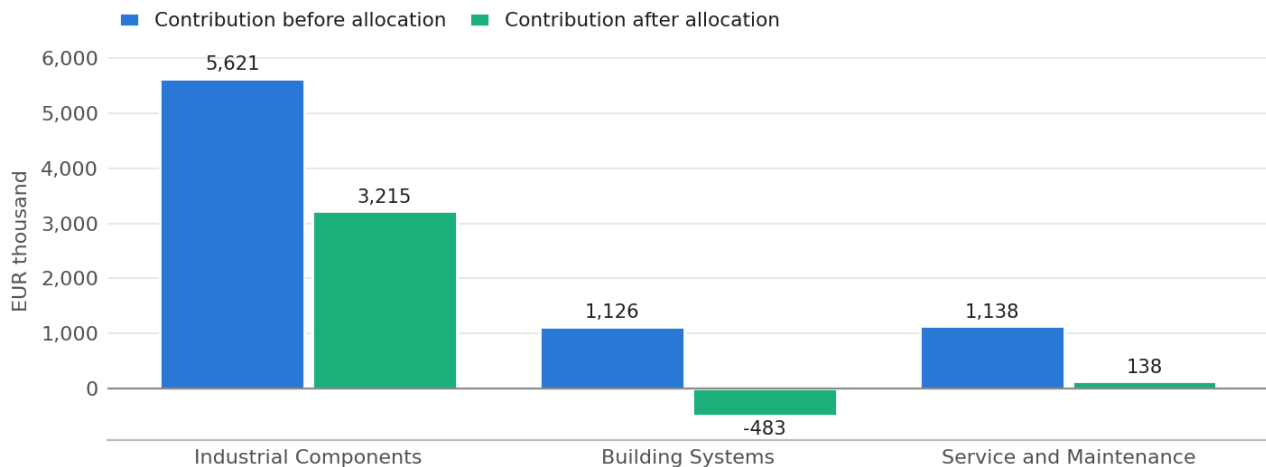


Chart 3: department contribution before and after shared-cost allocation, EUR thousand, January to September 2026. Source: results/A04b_contribution_bridge_ytd.csv.

Finding 3: four cost items explain the overspend, and two of them were never budgeted

Variance driver (YTD)	Variance to budget (EUR)
ERP consulting on IT Services (CC8100, account 7700), no budget	-228,329 U
New cost centre Quality and Compliance (CC8600), no budget and no allocation driver	-261,673 U
Marketing on Sales Building Systems (CC2100, account 7600), trade fair in March	-108,651 U
Energy, all cost centres (account 7200)	-103,994 U
Sum of the four items	-702,648 U
All other cost lines, net	+59,030 F
Total cost variance	-643,618 U

The ranked variance list (A09) shows the same picture at cost-centre and account level. ERP consulting has been posted on IT Services every month since May (EUR 228,329 so far) without a budget. The Quality and Compliance cost centre was opened in April and has cost EUR 261,673 with no budget. The trade fair in March cost EUR 120,889 against a monthly marketing budget of EUR 18,500. Energy was EUR 139,344 over budget in January and February alone and has partly recovered since (YTD EUR 103,994 over). These are budget-quality and approval questions, not accounting errors.

Finding 4: 5% of shared costs cannot be allocated, and the department ranking depends on the allocation key

Shared service cost centres carry EUR 5,277,534 year to date. EUR 5,015,861 is allocated to the three operating departments with documented drivers (IT users, headcount, budgeted revenue, floor area, a fixed percentage). EUR 261,673 (5.0%) sits on cost centre CC8600, which has no driver, and is reported as 'unallocated' rather than being spread without a rule. The allocation reconciliation (A11b) shows pool = allocated + unallocated for every one of the 126 period and cost-centre pools. Building Systems receives 32.1% of allocated cost with 30.1% of revenue; section 6 shows how far the result moves under other keys.

Bridge to net result (EUR, YTD)	Amount
Industrial Components: contribution after allocation	3,214,509
Building Systems: contribution after allocation	-483,142
Service and Maintenance: contribution after allocation	137,801
Shared costs without allocation driver (unallocated)	-261,673
P&L lines without cost centre (unassigned)	-48,158
Financial result	-155,084
Company net result	2,404,253

Finding 5: the close checks found 79 exceptions; Sep 2026 has one blocker and three must-fix items

Check	Severity	Owner	All periods	Amount (EUR)	Sep 2026	Amount (EUR)
CHK01 Unbalanced journals	blocker	GL accountant	4	1,350.02	1	1,250.00
CHK02 Missing cost centre	must fix	Controller	12	76,061.88	3	13,274.18
CHK03 Potential duplicate invoices	review	AP accountant	6	84,059.34	0	-
CHK04 Possible duplicate invoices (weaker match)	review	AP accountant	3	86,607.23	0	-
CHK05 Posting date outside period	must fix	GL accountant	5	-	0	-
CHK06 Late invoices	review	AP accountant	8	-	0	-
CHK07 Document dated after period end	review	GL accountant	4	-	0	-
CHK08 Entered after period close	review	Head of accounting	4	-	0	-
CHK09 Posting to closed cost centre	must fix	Controller	3	8,770.00	0	-
CHK10 Unallocated shared costs	review	Controller	6	261,672.55	1	40,370.68
CHK11 Actuals without budget	info	Controller	24	470,631.40	4	81,642.75

Over 24 months the checks list 79 exceptions, 53 of them in 2026. 13 of the 23 closed periods still contain at least one blocker or must-fix item, so earlier closes were signed off with open items; only 4 periods are completely clean. For Sep 2026: journal MJ-202609-00001 is out of balance by EUR 1,250.00 (the whole ledger is out by EUR 1,350.00, exactly the sum of the 4 unbalanced journals), 3 purchase lines worth EUR 13,274.18 have no cost centre and therefore appear in no department report, and EUR 40,370.68 of shared cost is unallocated. Across all periods, 9 purchase invoices with a gross value of EUR 170,666.57 look like second entries of an invoice already booked. These are items to check against the documents; typical causes are an invoice received both by e-mail and by post, a typing error or late paperwork.

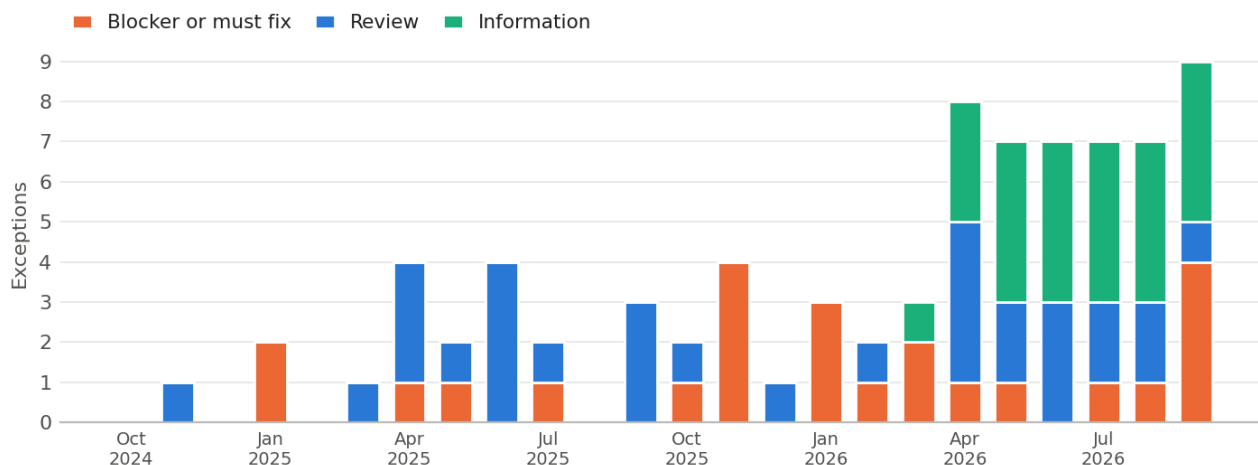


Chart 4: exceptions per period by severity group. Source: close_check_results. Synthetic data with deliberately planted exceptions.

5. Recommendations

#	Recommendation	Evidence	Trade-off	Risk if done / not done
1	Do not close Sep 2026 until the blocker and must-fix items are cleared, and make the close cockpit a formal gate: a period with an open blocker cannot be set to 'closed'. Correct by reversal and re-posting (Storno), never by editing the original line.	Finding 5: 1 unbalanced journal, 3 lines without cost centre; 13 earlier periods closed with open items.	The close may take a day longer in months with open items; someone must own each check.	Done: pressure to waive the gate at quarter end. Not done: department reports stay incomplete and the trial balance does not balance.
2	Give the two unbudgeted cost blocks an owner, a supplementary budget and, for CC8600, an allocation driver; then reforecast the year. Until this is decided, keep reporting CC8600 as unallocated.	Findings 3 and 4: ERP consulting EUR 228k and CC8600 EUR 262k without budget; 5.0% of shared cost unallocated.	Allocating CC8600 by headcount lowers every department's contribution (Building Systems by a further EUR 80k); a supplementary budget makes the original budget less comparable.	Done: discussion about the 'fair' key. Not done: variances stay unexplained each month and nobody is accountable for the cost.
3	Review Building Systems with its management: revenue plan for the rest of the year and the cost base in assembly and sales. Judge the department on contribution before allocation; treat the result after allocation as information about cost coverage, not as a reason to close the department.	Finding 2: revenue 9.1% below budget in all 9 months; contribution before allocation still EUR 1,126k.	Cost measures can hurt delivery capacity if demand returns; the analysis shows where the gap is, not why customers buy less.	Done: shared costs do not disappear if the department shrinks, they move to the other two. Not done: the gap grows by roughly the monthly shortfall.

A fourth, smaller step follows from Finding 5: add entry controls in accounts payable (cost centre mandatory on accounts that require one; a warning when vendor, reference and amount already exist). The trade-off is more friction at invoice entry and some false warnings.

6. Sensitivity analysis

6.1 How much does the allocation key change the department result?

Scenario (EUR, YTD contribution after allocation)	Industrial Components	Building Systems	Service and Maintenance	Change for Building Systems
S1 Base: drivers as stored; CC8600 unallocated	3,214,509	-483,142	137,801	base
S2 Base, and CC8600 allocated by headcount	3,096,819	-563,271	73,948	-80,129
S3 Whole pool by revenue share	2,726,834	-464,748	345,410	+18,393
S4 Whole pool by headcount	3,247,441	-490,463	-149,483	-7,321

Building Systems is negative after allocation under every key (EUR -563k to EUR -465k), so that conclusion is robust. Service and Maintenance is not: it swings from EUR 345k under a revenue key to EUR -149k under a headcount key, because it has many employees relative to its revenue. The company total is identical in all scenarios; only the split changes. Source: results/A12a_sensitivity_allocation_key.csv.

6.2 How sensitive are the review lists to the thresholds?

Check and threshold	Items	Amount (EUR)	Used in the close checks
CHK06 late invoices: more than 20 days	8	-	
CHK06 late invoices: more than 30 days	8	-	
CHK06 late invoices: more than 45 days	8	-	yes
CHK06 late invoices: more than 60 days	7	-	
CHK06 late invoices: more than 90 days	3	-	
CHK11 actuals without budget: at least EUR 1,000	31	494,751.91	
CHK11 actuals without budget: at least EUR 2,500	30	492,901.91	
CHK11 actuals without budget: at least EUR 5,000	24	470,631.40	yes
CHK11 actuals without budget: at least EUR 10,000	18	437,342.20	
CHK11 actuals without budget: at least EUR 25,000	6	264,054.13	

Lowering the budget-control threshold from EUR 5,000 to EUR 1,000 adds only a few small items, so EUR 5,000 keeps the list short without hiding much value. The late-invoice list does not change between 20 and 45 days because the synthetic invoices are either prompt or clearly late; real data would have a tail in between, so this threshold should be re-tested on real postings. Source: results/A12b_sensitivity_thresholds.csv.

7. Validation summary

Area	Tests	Passed	What is proven
Row counts	9	9	Every table holds exactly the rows the generator wrote.
Control totals	3	3	Debit, credit and budget totals equal the generator's control totals.
Referential integrity	9	9	No orphan rows in any relationship (anti-joins).
Keys and line rules	6	6	Keys are unique; each line is one-sided; drivers point to the right kind of object.
Scope	3	3	24 periods, line volume within 30,000 to 60,000, last period as intended.
Journal balancing	3	3	All journals balance except the planted ones; the ledger difference equals their sum.
Budget aggregation	3	3	Budget totals are identical in the table, the views and the result file.
Allocation completeness	4	4	Pool = allocated + unallocated for every pool; shares add to 100%; nothing is posted.
Reconciliation to source	8	8	Report totals (views and result files) equal credits minus debits in journal_lines.
Planted exceptions	12	12	Each check finds exactly the planted items: none missed, none extra, amounts equal.
Close checks	2	2	The cockpit grid is complete and its counts equal the exception list.
Total	62	62	

Tested by execution: the complete pipeline (schema, load, views, close checks, 17 analysis queries, validation) was run end to end on DuckDB 1.4.5 through the Python API; all 62 of 62 tests pass and the generator produces identical files on repeated runs. **Not tested:** the DuckDB command-line client, other DuckDB versions, PostgreSQL or any other engine (the SQL uses DuckDB features such as GROUP BY ALL, QUALIFY and COPY ... TO), performance on larger volumes, and behaviour on real ledger data.

8. Source references

All data: generator/generate_data.py (seed 4711), input files in data/input, answer key in data/expected. Engine: DuckDB 1.4.5. Result files: results/A01 to A12. Tests: validation_results.csv. Real-world reference parameters (20% Austrian standard VAT rate; 13th and 14th salaries) and all assumptions are listed in Source_Register.csv. This report contains no investment advice and makes no statement about any real company.