

AI variance analysis

From numbers to a review-ready explanation

A worked monthly review for a fictional power-panel manufacturer. Build the bridge, check the explanation and identify the next decision.

September 2026	Budget	Actual	Variance
Revenue, INR lakh	328.0	274.6	(53.4)
Contribution, INR lakh	84.0	61.6	(22.4)
EBITDA, INR lakh	45.0	21.1	(23.9)
EBITDA margin	13.7%	7.7%	(6.0) pp

What you will work through

The business sold fewer panels and a different product mix. Average selling prices and variable costs also changed. The calculations explain the financial effects. The source notes provide only part of the business explanation.

Use the three files together

Workbook: Review contains the management P&L and EBITDA bridge. Drivers shows the calculations and source reconciliations. Inputs holds the case data and management notes.

This guide: methods, worked conclusions, follow-up questions and the reviewer checklist. **Prompt file:** editable instructions for an AI-assisted review.

A practical sequence

1. Review the input basis and reconcile the source totals.
2. Trace the revenue and profit bridges.
3. Run the prompts and challenge causal claims.
4. Prepare commentary and agree follow-up actions.

All figures and management notes are fictional. Workbook amounts are INR. Guide amounts are INR lakh: 1 lakh = 100,000. Worked answers apply to the original inputs only.

Build a bridge that reconciles

A fall in average revenue per panel can reflect a different product mix. Separate total units, product mix and realised price before interpreting the result.

Revenue bridge	INR lakh
Budget revenue	328.0
Total volume effect	(32.8)
Product mix effect	(19.2)
Price / realisation effect	(1.4)
Actual revenue	274.6

The calculation convention

Budget units total 200; actual units total 180. At budget product shares, those 180 units would comprise 90 standard, 54 motor control and 36 custom panels. Actual sales were 90, 70 and 20 respectively.

Volume: (fixed-mix quantity - budget quantity) x budget price.

Mix: (actual quantity - fixed-mix quantity) x budget price.

Price: actual quantity x (actual price - budget price).

The sequence is budget, total volume, product mix, then price. Quantity-price interaction is included in price at actual quantity. Other conventions can allocate effects differently; this convention reconciles exactly.

Bridge contribution using budget unit contribution

Budget unit contribution is price less variable material and conversion cost: INR 25,000 for standard panels, INR 45,000 for motor control panels and INR 80,000 for custom panels. Apply the volume and mix quantities to these margins.

Material effect = -actual quantity x (actual material cost per unit - budget material cost per unit). Apply the same method to conversion cost. Higher unit costs reduce profit.

References: Drivers!B7:L10, B15:H18 and B23:J26. Product-family averages may still contain changes in specification or customer mix. This is not a SKU-level price or manufacturing-efficiency analysis.

Read the profit result correctly

EBITDA bridge	INR lakh
Budget EBITDA	45.0
Total sales volume	(8.4)
Product mix	(5.6)
Price / realisation	(1.4)
Material cost per unit	(3.7)
Conversion cost per unit	(3.3)
Fixed factory overhead	(2.0)
Selling and administration	0.5
Actual EBITDA	21.1

Volume and mix explain INR 14.0 lakh of the INR 23.9 lakh EBITDA decline. Material and conversion unit-cost effects explain a further INR 7.0 lakh. These are quantified effects, not verified root causes.

Lower total cost can hide worse unit economics

Total material cost is INR 27.3 lakh below budget, but volume and product mix changed. At actual units and budget material costs, material spend would have been INR 167.0 lakh. Actual spend was INR 170.7 lakh: an adverse INR 3.7 lakh unit-cost effect.

Conversion expense is INR 3.7 lakh below budget in total. At actual units and budget conversion costs it would have been INR 39.0 lakh. Actual expense was INR 42.3 lakh: an adverse INR 3.3 lakh unit-cost effect.

Accounting basis

Contribution is revenue less variable material and conversion attributable to panels sold. All fixed factory overhead is expensed in this simplified management P&L. Fixed overhead and SG&A exclude depreciation and amortisation. EBITDA excludes interest and tax. There are no inventory-absorption or revenue-timing adjustments.

Do not label this contribution line statutory gross profit. Reconcile inventory absorption, returns, rebates, FX and revenue cutoff before applying the model to actual management accounts.

Separate evidence from a plausible story

What the case establishes	What remains unconfirmed
20 custom panels sold against 40 budget (E01).	Whether each of the 20 missing panels was eligible for September revenue.
Sales reports 12 panels awaiting customer inspection and 8 awaiting engineering release (E02).	Independent validation, revised dates and customer acceptance. No October delivery confirmation is supplied (E03).
Material unit-cost effect reduces profit by INR 3.7 lakh.	Purchase prices, usage, scrap, BOM changes and specification mix (E04).
Conversion unit-cost effect reduces profit by INR 3.3 lakh.	Labour hours, hourly rates, overtime, rework and allocation effects (E05).

An explanation to reject

"Weak demand and supplier inflation drove the shortfall. Lower conversion spend shows better productivity. Delayed custom orders will recover in October."

A defensible replacement

Revenue is INR 53.4 lakh below budget, including INR 32.8 lakh from lower total units and INR 19.2 lakh from product mix. Sales reports inspection and engineering holds affecting the custom-panel shortfall. Recovery timing is unconfirmed. Material and conversion costs per unit reduced profit by INR 7.0 lakh; the available data does not separate price, usage or efficiency causes.

What finance should ask next

Which orders were committed for September, what prevented release, and when can each be recognised? Which component prices, usage quantities or panel specifications changed? Which labour-hour, rate or rework changes explain conversion cost?

A management note is a reported explanation. A reconciled calculation confirms arithmetic. Neither alone establishes the underlying business cause.

Use AI in four review steps

Copy the complete prompts from AI-Variance-Prompts.md. Attach the workbook in an approved environment that can read its data. If the tool cannot read calculated values or all tabs, provide the relevant exports and resolve the access gap first.

Step	Ask for	Review before continuing
1. Validate	Check period, basis, units, required inputs and source-control reconciliations.	Source differences, absent inputs and cutoff issues. Do not draft final commentary around unresolved controls.
2. Analyse	Follow the workbook convention. Produce revenue and EBITDA bridges and separate facts, notes and hypotheses.	Amounts reconcile; signs, units and product-family comparisons are consistent.
3. Challenge	Test demand weakness, inflation, productivity and October recovery claims against evidence.	Unsupported claims are corrected or remain explicitly unresolved.
4. Draft	Produce up to 220 words of commentary plus proposed actions, owners and deadlines.	Every conclusion traces to a calculation or identified management note. Actions address the evidence gaps.

Set a review threshold, then apply judgment

The prompt uses INR 1 lakh OR 10% of absolute budget as an illustrative threshold. Calibrate it to the business. A zero budget makes percentage variance unavailable. Include smaller offsets needed to reconcile the bridge and review accounting-cutoff issues regardless of amount.

Keep the calculations in the workbook

Use AI to organise evidence, challenge explanations and draft the review. Verify every quoted number against the workbook. Do not accept invented purchase-price or usage splits when only unit costs are available.

Protect the working context

Use data you are authorised to share and the AI environment approved by your organisation. Remove unnecessary customer and employee identifiers. The prompts request analysis and drafting, with no journal postings, price changes or outbound messages.

Worked management commentary

The following is a worked answer for the original case. Refresh it when inputs or evidence change.

September revenue was INR 274.6 lakh, INR 53.4 lakh below budget (16.3%).

Lower total units contributed INR 32.8 lakh, product mix INR 19.2 lakh and price / realisation INR 1.4 lakh to the shortfall (Drivers!C18:G18).

EBITDA was INR 21.1 lakh against INR 45.0 lakh budget. Margin fell from 13.7% to 7.7%, down 6.0 percentage points. Volume and mix reduced EBITDA by INR 14.0 lakh. Material and conversion unit costs reduced it by another INR 7.0 lakh. Fixed overhead overspend of INR 2.0 lakh and price / realisation of INR 1.4 lakh were partly offset by INR 0.5 lakh lower SG&A (Review!C21:C28).

Custom-panel sales were 20 against 40 budget. Sales reports 12 panels awaiting customer inspection and eight awaiting engineering release (E01-E02). September revenue eligibility and recovery timing remain unconfirmed (E03). The priority is to validate the held orders and revised release dates, then explain the unit-cost increases using procurement and production records. The current data does not establish supplier inflation or manufacturing inefficiency (E04-E05).

Proposed follow-up actions

Accountable roles and due dates below are proposals for the review, not agreed commitments.

Issue / proposed owner	Evidence and decision	Proposed due
Custom panels Sales head (operations support)	Order-level commitments, hold reasons, inspection and engineering release dates, revenue eligibility. Decide recovery plan and whether the forecast needs revision.	Review + 2 working days
Unit costs Plant controller	BOM/specification, purchase-price and usage data; labour hours, rates and rework. Decide corrective action after the INR 7.0 lakh effect is decomposed.	Review + 5 working days
Overhead Financial controller	GL detail and accrual support for INR 2.0 lakh overspend. Identify recurring spend, timing or accounting adjustments.	Review + 3 working days

Reviewer checklist and practice

Basis

Same period, currency and product scope. Contribution and EBITDA definitions are clear. Revenue cutoff and inventory absorption are addressed.

Inputs

Required inputs are present and numeric. Zero is distinguished from missing. Product-family comparability is reasonable.

Reconciliation

Source-control differences at Drivers!C31:D36 and bridge residual at Review!C29 are within INR 0.01. Totals have been checked to the source, not just to each other.

Variance logic

The revenue and EBITDA bridges reconcile. Expense signs are correct. Margin differences are in percentage points. Effects are not counted twice.

Evidence

Each business cause has an identified source. Management explanations are distinguished from independently validated facts. Unsupported recovery assumptions remain open.

Decision

Actions request the evidence needed for a decision. Owners and due dates are proposed or agreed explicitly. Commentary reflects the latest inputs.

Two short practice checks

Change actual standard-panel price: Inputs!F7 from INR 98,000 to INR 99,000. Revenue and EBITDA should each improve by INR 0.90 lakh. The price effect changes; other bridge effects stay unchanged. Restore INR 98,000.

Remove a required cost input: delete Inputs!H7. The dependent calculations must become unavailable instead of treating the cost as zero. Restore INR 63,000. A genuine zero can be entered as 0.

To adapt the example: replace all case inputs and ledger controls, refresh management notes, review the accounting basis, and extend formulas if the product scope changes. Panel-family averages do not replace SKU, order or production analysis.