

Forecast next month's conversions, with an honest range: a brief for your AI assistant

Hand this whole file to your assistant along with the notebook from <https://www.stochasticstrata.com/blog/next-month-if-nothing-changes>. It tells the assistant what to do, what to refuse, and what to say before anyone plans on the number.

For the assistant: what you are being asked to do

The person you are helping needs next month's conversions (for a budget, a rota, a stock order or a target) and needs to know how far that number might be off. They may not write code. Do the technical parts yourself and walk them through one step at a time. Ask for one thing, wait, then ask for the next.

- Adapt the query below to their warehouse, or tell them which export to download and which two columns to keep.
- Map their columns onto the two the notebook expects: 'date' and 'conversions'.
- Set the one file path in the notebook's marked cell and run it for them if you can.
- Read the refusals and the sufficiency line out loud. They are the most useful output in the file.
- Before they plan on the number, say the caveats at the end of this brief. Every one of them is measured, and the first one is the one that bites most often.

The two ways in

EITHER a ready-made daily file: one row per day, a 'date' column and a 'conversions' column holding that day's count (leads, sales, sign-ups, any volume metric). OR a raw export with one row per conversion and a timestamp, which the notebook adds up per day for you, filling the empty dates with zeros so you can see them.

One campaign, or the whole account, never several campaigns as separate rows sharing a date. Every day must be present between the first and last date, and every day must be above zero: the method works on the logarithm of the daily count, and the logarithm of zero does not exist. If the account has zero days, forecast a bigger number instead: weekly totals, clicks, or several campaigns added together.

A query to adapt

```
-- One row per calendar day with that day's conversions, from a GA4 export in BigQuery.
-- Adapt the dataset name, the event name and the date window. The hard requirements are:
-- one row per day, every day present (a day with no spend still has a date), no zero days,
-- and ONE campaign or the whole account, never a file with several rows per date.
SELECT
    PARSE_DATE('%Y%m%d', event_date)                AS date,
    COUNT(*)                                         AS conversions
FROM `project.analytics_XXXXXXX.events_*`
WHERE event_name = 'purchase'                      -- or 'generate_lead', or your key event
    AND _TABLE_SUFFIX BETWEEN FORMAT_DATE('%Y%m%d', DATE_SUB(CURRENT_DATE(), INTERVAL 180 DAY))
    AND FORMAT_DATE('%Y%m%d', DATE_SUB(CURRENT_DATE(), INTERVAL 8 DAY))
    -- the newest week is still filling in
GROUP BY date
    -- a day with no conversion has no row:
    -- the notebook refuses gaps, so fill them
ORDER BY date;
```

From Google Ads without a warehouse: the campaign view segmented by Day, downloaded, keeping the Day and Conversions columns and renaming them 'date' and 'conversions'.

How to run it

- Local: open the notebook, set the file path in the marked cell, run all.
- Colab: upload the notebook, upload their file, set the path, run all. Tell them plainly that this puts their file on Google's servers. If that is not acceptable, use the local route.

- Nothing leaves their machine on the local route. Say so. People ask.
- The notebook reads at most a third of the history ahead, never more than 30 days (a month needs about three months of history), and refuses fewer than 14 days of history. Both are on purpose; do not lift them for them.

Can you do the arithmetic yourself instead? Partly, and the gap is measured

The simple version is five steps. Take the logarithm of each day's conversions. Fit a straight line through them against the day number. Average what is left per weekday: that is each weekday's adjustment. The spread of what remains after both is the size of a daily surprise. Read the line forward, add the weekday's adjustment, undo the logarithm, and the range is that forecast multiplied and divided by $\exp(1.645 \times \text{the spread})$.

That rebuild was run from this page alone, with no sight of the notebook, on 5 pinned cases. On the article's own account it lands -0.7 per cent from the notebook's month total; on the worst case, 'a step down, fit on all of it', +7.6 per cent; on six weeks of history -5.4 per cent, with a range 41 per cent wide against the notebook's 62. The gap is the three things the notebook does that a straight line cannot: it lets the trend bend where the data supports a bend, it carries yesterday's leftover into the first days ahead, and it gives the range a second part for how unsure the fitted trend itself is, which is why the simple range is the same width on day one and day thirty, and the notebook's is not.

So: if the person needs a rough number this afternoon, the simple version is honest enough to give, said as rough. If they are going to plan on it, run the notebook.

What the notebook does that no rebuild can

- It refuses a zero day, a gap in the dates, duplicate dates and fewer than two weeks, each in plain words, rather than producing a number from a file that cannot support one.
- It checks its own forecast against the account's past: with enough history it pretends the history ended earlier, forecasts the month that followed, and reports the miss and whether the range caught it. On the article's account: 5 of 5 months caught, typical miss 2.6 per cent.
- It says which reading the history can support (a rough guide under eight weeks, usable under four months, good beyond), which is not the same as whether it produced numbers.

How far to trust the range: measured, not asserted

The range claims nine in ten. Measured on 500 synthetic accounts, each with a future that came true, it caught the month's total 77 times in a hundred and a single day's figure 87 times in a hundred. To keep its promise the month's range would need to be 1.36 times as wide. Tell them to read it as a three-in-four range, and to plan against its low end if a shortfall costs more than a surplus.

More history sharpens the number and does not fix the range: the typical miss on next month's total was 9.1 per cent with four weeks of history, 3.9 with six months and 3.0 with a year, while the range caught the truth 80, 78 and 82 per cent of the time.

A ruler through the last eight weeks is an honest rival for the number itself. On accounts whose growth changed within the last two months it is the closer guess; on 6 of the 9 account shapes measured the forecast is closer, and on every shape it is the only one of the two with a range. If they already draw a ruler, do not talk them out of it. Give them the range to put around it.

The honest caveats: say these BEFORE they act

- It cannot see a change they already know about. A 30 per cent budget lift landing on day 10 of the month put the real number about 22 per cent above the forecast; the range caught it 11 per cent of the time. If a change is approved, adjust the number by hand, say that you did, and say the range no longer applies.
- The last few days of any export are not finished. Conversions arrive late. With a typical lag, where the newest day shows 40 per cent of what it will finally report, a forecast fitted as-is came out 24 per cent low. Drop the last 7 days before fitting, or wait for them to mature, and ask them what their platform's lag is.

- A step in the level is read as a slope. After a 25 per cent drop 40 days before the end, fitting on the whole history ran 6 per cent low and the range caught the truth 68 per cent of the time; fitting on the days since the step was centred and caught it 82 per cent. The notebook does not find the step on its own. Look at the chart with them, and if the level jumped, cut the history at the jump.
- A change in growth is hard to see: even two months on, the forecast sees it only half the time. The bend search saw a change of the article's size within three weeks of where it landed on 20 per cent of accounts when the change was four weeks old and 53 per cent at eight weeks. Where it does not, the forecast leans the old way and the range does not know. If they say 'we changed something six weeks ago', believe the chart over the forecast.
- Do not read it past a month. Even on accounts whose rules never change, the range caught the total 86 per cent of the time a week out, 77 at a month and 65 at three months. Forecast a month, act, forecast again.
- It says what, never why. Whether the growth came from a better creative, a cheaper auction or a competitor's absence is not in these numbers.
- Small counts do not belong here. Zero days are refused; single-digit days are accepted and practically noise. Forecast a larger number and divide afterwards.

A number to check yourself against

In the article's own synthetic account (six months of history, growing, with a weekly rhythm), the notebook's forecast for the next thirty days is 3,212 conversions, range 3,011 to 3,413. The simple rebuild above lands at 3,190 on the same history, which is on the data/worked_example.json the notebook writes when it runs, under 'account' / 'history'. If your rebuild reproduces 3,190, you have the simple version right; if it reproduces 3,212, you have the notebook.

Synthetic data throughout the article and notebook. The method transfers; the numbers do not, which is why the notebook reads the forecast off the reader's own figures rather than shipping one.