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Case study

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CS11

AI Finance, Data and Decision Intelligence

An AI business analyst for a company that will never hire a data team

Sector: distribution, retail, manufacturing, software, professional services, logistics, healthcare and hospitality

Geography: United States. Company size: 20 to 200 employees.

Figures are measured outcomes from delivered work. The client is described by sector and geography at the client's request.

THE BUSINESS PROBLEM

The situation before we started

The business had plenty of data and no way to interrogate it. Every question became a request to someone already busy, and the answer arrived two days later when the decision had been made. The owner had learned to stop asking.

01

Questions cost days

A margin question goes to finance, then to a spreadsheet, then to a report. Two days later the moment has passed.

02

The month is closed before it is understood

Financial reporting takes so long that problems are found weeks after they started costing money.

03

Spreadsheets carry the business logic

The real model lives in one analyst's workbook, and nobody else can audit it or reproduce it.

04

Cash is forecast on instinct

Receivables ageing and real payment behaviour are not connected to the forecast, so the forecast is a guess.

05

Customer profitability is unknown

Revenue per customer is visible. Margin per customer, after service cost, usually is not.

06

Anomalies are found by accident

Nothing watches the numbers between reporting cycles, so a bad trend runs for a full month unchallenged.

WHAT WE CHANGED

The issue, what we implemented, and what it moved

What was wrong	What we implemented	What it delivered
A margin question took two days to come back	Gemini with Conversational Analytics over a governed BigQuery model	**The same question now returns in two to five minutes**
Reporting closed weeks after a problem started costing money	Datastream and Dataflow loading BigQuery continuously	**60 to 90% less financial reporting effort**
Business logic lived inside one analyst's spreadsheet	Metric definitions moved into a version controlled LookML semantic layer	**50 to 80% less manual spreadsheet analysis**
Cash was forecast on instinct	BigQuery ML forecasting on real receivables and payment behaviour	**Near real time cash flow visibility**
A bad trend ran unchallenged for a full month	BigQuery ML anomaly detection running continuously with alerting	**Anomalies surfaced in minutes rather than at close**
Every report needed an analyst to build it	Looker dashboards plus a natural language chat surface	**70 to 90% faster report generation**

Middle column names the Google Cloud service that did the work. Right column is measured against the baseline captured in phase one.

SOLUTION OVERVIEW

What we built, and where we drew the line

We built one governed data layer in BigQuery, defined the business metrics once, and put Gemini on top of those definitions. The owner asks in plain English. The answer comes back with the query, the rows and the assumptions attached.

WHAT THE SYSTEM DOES

- Answers finance, sales and inventory questions in plain English against governed definitions
- Explains why a number moved by decomposing it into its drivers
- Forecasts revenue, cash and demand using the company's own history
- Watches for anomalies continuously and raises them without being asked
- Models what if scenarios on price, volume and cost

WHAT THE SYSTEM NEVER DOES

- Invents a metric definition that finance has not approved
- Posts, adjusts or closes anything in the accounting system
- Presents a forecast without its confidence range and its assumptions
- Answers when the underlying data is stale, it reports the staleness instead
- Replaces the accountant, the audit or the statutory close

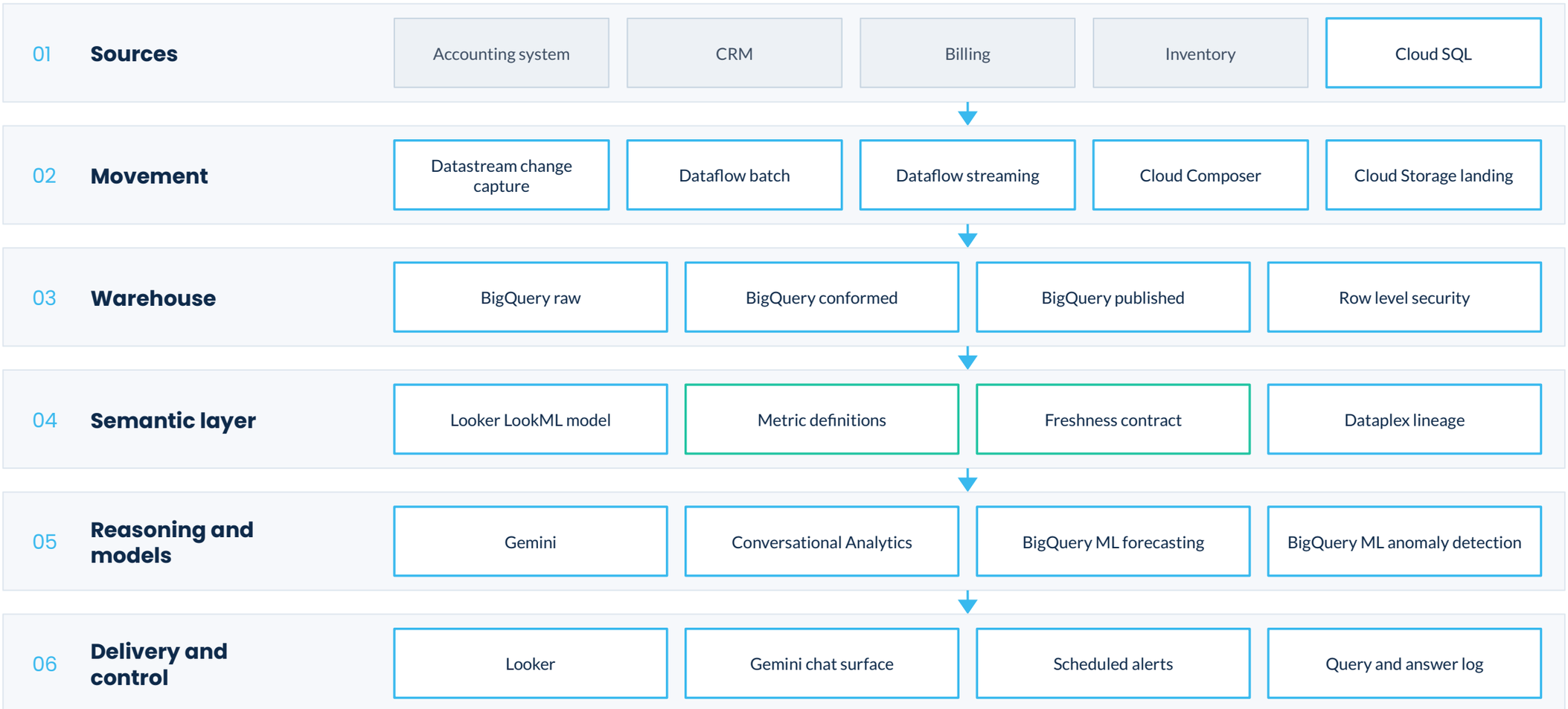
ARCHITECTURE

How the platform is put together

01	**Sources**	Accounting, CRM, billing, inventory, payroll exports and operational systems, plus Cloud SQL where an application database is involved
02	**Movement**	Dataflow handles batch and streaming loads, with change capture and late arriving data handled explicitly
03	**Warehouse**	BigQuery holds raw, conformed and published layers, so every published number can be traced back to a source row
04	**Semantic model**	Metrics such as gross margin, sales velocity and lifetime value are defined once and version controlled
05	**Reasoning and models**	Gemini with Conversational Analytics answers questions. BigQuery ML carries forecasting, churn and anomaly models
06	**Delivery**	Looker for the standing view, a chat surface for the ad hoc question, and alerts for what cannot wait

Google Cloud services used BigQuery · BigQuery ML · Gemini · Conversational Analytics · Looker · Cloud SQL · Dataflow · Cloud Run

The components and how they connect



RUNTIME DATA FLOW

What happens when the owner asks a question

01

Ask

The question arrives in plain English through Looker or the Gemini chat surface.

02

Interpret

The system restates its reading of the question, including the date range.

03

Resolve

It maps the words to approved metrics in the LookML semantic layer.

04

Authorise

BigQuery row level security narrows the data to what this user may see.

continues

05

Query

Generated SQL runs against the published dataset only.

06

Check

The freshness contract reports how current the underlying tables are.

07

Explain

Gemini decomposes the result into drivers ranked by contribution.

08

Attach

The answer ships with the query, the rows and the assumptions used.

A question outside the approved definitions returns a refusal rather than an improvised number.

CAPABILITIES

Four kinds of question the system answers

Financial

- Revenue, gross and net margin
- Expense drift by category
- Receivables and payables ageing
- Cash flow and runway
- Customer and vendor profitability

Sales

- Pipeline, conversion and velocity
- Average deal size movement
- Churn and retention
- Representative performance
- Customer lifetime value

Inventory

- Demand forecasting by SKU
- Stockout and overstock prediction
- Slow moving stock detection
- Reorder recommendations
- Seasonality and supplier reliability

Predictive

- Revenue and cash forecasts
- Churn probability by account
- Margin forecast by segment
- Anomaly detection across all series
- What if pricing and cost scenarios

WORKED EXAMPLE

The owner asks why profit fell this quarter

01 Ask

The question is typed in plain English. No ticket is raised and no analyst is interrupted.

02 Decompose

The system breaks profit into revenue, cost of sale, operating expense and mix, then tests each one.

03 Find

Revenue is down 4 percent, marketing cost is up 12 percent and customer acquisition cost is up 19 percent.

04 Attribute

Three high value accounts reduced their purchase volume, and together they explain most of the revenue gap.

05 Explain

The answer names the drivers in order of contribution and links to the rows behind each one.

06 Act

The owner asks a follow up about those three accounts, and the answer arrives in the same conversation.

The old path was finance, then Excel, then SQL, then a report, and it took about two days. The target path takes two to five minutes.

The controls that make this deployable in a real business

Row level access

Finance sees all of it. A sales manager sees their own region. Access is enforced in BigQuery, not in the dashboard.

Governed definitions

Only approved metric definitions are answerable. A question outside the model returns a refusal, not an improvised number.

Traceability

Every answer carries the generated query and the rows it read, so finance can reproduce it.

Freshness contract

Each table publishes a freshness expectation. The answer states how current the data actually is.

Separation from the ledger

The platform reads from accounting and never writes back to it.

Audit

Questions, generated queries, results and forecasts are retained for review.

DELIVERY

How the engagement ran

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Weeks 1 to 4

Foundation

Sources were connected and the raw and conformed layers were built. Finance signed off the first set of metric definitions.

Phase 1

Weeks 5 to 8

Ask anything

Conversational analytics went live over the governed model, with row level access applied and every answer traceable.

Phase 2

Weeks 9 to 13

Forecast and detect

BigQuery ML delivered revenue, cash and demand forecasts, plus anomaly detection that runs without being asked.

Phase 3

Ongoing

Extend

Scenario modelling, customer profitability and inventory intelligence were added as data quality allowed.

Phase 4

Every phase ended with something the customer could use. No phase ended with a document only.

RESULTS

What the engagement delivered

Finance and BI KPI	Baseline	Result delivered
Financial reporting time	Days per cycle	**60 to 90% reduction**
Manual spreadsheet analysis	Continuous	**50 to 80% reduction**
Invoice processing time	Manual handling	**50 to 80% reduction**
Receivables follow up	Ad hoc and manual	**50 to 80% automated**
Cash flow visibility	Monthly at best	**Near real time**
Time to answer a business question	Days	**Minutes**
Dashboard and report generation	Analyst dependent	**70 to 90% faster**
Financial anomaly detection	Hours to days, if at all	**Minutes, continuous**
Forecasting cycle	Manual and periodic	**30 to 60% faster**

Each figure is measured against the baseline captured in phase one of the same engagement. Client identity is withheld at the client's request.

HEADLINE RESULTS

The five numbers this engagement moved

60 to 90%	Days to minutes	30 to 60%	50 to 80%	Near real time
Less reporting effort	Business analysis cycle	Faster forecasting	Less manual data analysis	Business KPI visibility

What that looked like in this business

A question such as which customers generated less gross margin this quarter used to travel from finance to Excel to SQL to a report, and it took about two days. Against the governed BigQuery model with Gemini on top, the same question now comes back in two to five minutes.

GOOGLE CLOUD IMPACT

Three layers of measurement in every engagement

01 Business impact

Revenue, cost, productivity, downtime, inventory and customer experience. This is what the customer signed for.

02 AI impact

Automation rate, response time, prediction accuracy, resolution rate and human hours returned. This is what proved the system worked.

03 Google Cloud impact

Consumption and adoption the deployment created. This is what grows the account.

CONSUMPTION THIS DEPLOYMENT CREATED

- BigQuery data processed per month
- BigQuery storage under management
- BigQuery ML models trained and served
- Gemini and Conversational Analytics queries
- Looker users and active dashboards
- Dataflow pipeline throughput
- Cloud SQL and Cloud Run workloads

WHERE IT FITS

The businesses this solution is built for

This solution is designed for distribution, retail, manufacturing, software, professional services, logistics, healthcare and hospitality.
Geography: United States. Company size: 20 to 200 employees.

Distributors

Retailers

Manufacturers

Software companies

Professional services

Logistics

Healthcare

Hospitality

The common shape

These businesses all have real operational complexity and no in house platform team. They already pay for the systems that hold the data, and they have never had a way to use it together. That is the gap this solution closes.

What we flagged before we started

RISKS WE MANAGED EXPLICITLY

Definitions are the hard part, not the technology

Two people in the same company define gross margin differently. We force that argument to happen in week two, in writing.

Answers are only as fresh as the pipeline

A daily load cannot answer an intraday question. Each table publishes its freshness and the answer states it.

Forecasts need history

Twelve months of clean history is the practical minimum. Below that we report ranges and we say the confidence is low.

Natural language invites ambiguous questions

This quarter can mean three different things. The system restates its interpretation before it answers.

The platform does not replace the close

This is management intelligence. Statutory reporting stays with the accountant, and we say that on the first slide of every review.

WHAT WE SETTLED IN DISCOVERY

- Which accounting system is authoritative, and what is its export or API surface?
- Who owns the metric definitions and can sign them off?
- How much clean history exists for forecasting, by entity?
- What row level access rules apply to sales and operations users?

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Let us talk about your operation

The next step we would suggest is a two week assessment against your own data. It tells you which of these numbers are reachable in your business before you commit to a programme.

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Disclaimer

This document describes work Tech4Biz Solutions has delivered. The performance figures shown were measured after implementation against a baseline captured during phase one of the same engagement. They describe what this client achieved and they are not a warranty of the same outcome elsewhere.

Results in another business will depend on the quality and completeness of its existing data, the systems in use, the level of process change it is willing to make, and the licence tiers held for the underlying platform services.

Client identities are withheld at the client's request. Sector and geography descriptors are provided in place of names, and figures are reported as measured.

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