Documentation: Using n8n with AI Agents to Retrieve Sales Insights

Goal of the Project

The goal of this project is to empower both non-technical and technical users to easily extract, analyse, and understand sales data without the need for complex SQL knowledge or manual data processing. By combining n8n's workflow automation with AI-driven insights, the project aims to streamline access to meaningful business intelligence from large and diverse datasets, helping organizations make faster and more informed decisions.

Introduction

Extracting useful information from sales data often requires writing complex SQL queries, joining multiple tables, and handling large datasets. For many non-technical users, this process can be intimidating or even impossible without technical support. Even for technical users, performing repeated queries across different tables can be time-consuming and prone to errors.

This is where **n8n** (an open-source workflow automation tool) combined with **AI Agents** becomes powerful. By connecting AI with databases through n8n, businesses can automate data retrieval, generate insights in plain language, and make sales analytics more accessible to everyone in the organization.

How n8n with AI Agents Works

1. **Data Connection:** n8n connects to a SQL Server (or other databases like PostgreSQL, MySQL, etc.) using built-in nodes. This allows workflows to query sales tables directly.
2. **Query Execution:** Queries can be predefined (e.g., "Get monthly sales by region") or dynamically generated by an AI Agent based on a user's natural language request.
3. **AI Interpretation:** The AI Agent interprets the raw query results, summarizes them, and transforms the data into human-readable insights.
4. **Output Delivery:** Insights can be delivered automatically via email, Slack, dashboards, or reports—without the user ever writing SQL.

Benefits

1. For Non-Technical Users

- **No SQL Knowledge Required:** Users can simply ask questions like *"What are the top 3 products in APAC last quarter?"* and receive a clear answer.
- **Plain Language Reports:** The AI translates complex data into easy-to-read summaries, helping business teams understand trends quickly.
- **Faster Decisions:** With real-time access to insights, teams can act without waiting for technical staff to prepare reports.

2. For Technical Users

- **Reduced Manual Work:** Instead of manually merging or transforming data from multiple tables, n8n workflows can automate joins and aggregations.
- **Error Reduction:** Automated workflows minimize mistakes caused by manual query writing.
- **Scalable Analysis:** Large datasets across multiple regions, products, and time periods can be processed automatically.

3. For Organizations

- **Improved Collaboration:** Both technical and non-technical teams can share the same AI-generated insights.
- **Cost Efficiency:** Saves time spent on repetitive report preparation, freeing up resources for higher-value analysis.
- **Consistency:** Ensures that everyone gets standardized and accurate reports.

Example Use Case: Sales Insights

- **Step 1:** n8n connects to the Sales table in SQL Server.
- **Step 2:** A user requests: *"Show me the top-performing products by revenue in APAC."*
- **Step 3:** The AI Agent generates the SQL query automatically and executes it via n8n.
- **Step 4:** Results are summarized by the AI: *"Product A generated $25,000.50 in APAC, making it the top product in that region."*
- **Step 5:** The summary is sent to the user via email or Slack.

Conclusion

Using **n8n with AI Agents** to extract insights from sales data bridges the gap between technical data analysis and business decision-making. Non-technical users gain access to insights without needing SQL knowledge, while technical users benefit from automation and efficiency. This approach empowers organizations to unlock the full value of their sales data, making informed decisions faster and more effectively.

Example and Output

SaleID	SaleDate	Region	Product	Revenue
1	2025-01-10	APAC	Product A	12000.00
2	2025-01-15	EMEA	Product A	8000.00
3	2025-01-20	APAC	Product B	15000.00
4	2025-02-01	Americas	Product C	5000.00
5	2025-02-05	APAC	Product C	7000.00
6	2025-02-10	EMEA	Product B	11000.00
7	2025-02-15	Americas	Product A	9500.00
8	2025-03-01	APAC	Product A	13000.00
9	2025-03-05	EMEA	Product C	7200.00
10	2025-03-10	Americas	Product B	10000.00

```sql
SELECT sum(Revenue) as TotalRevenue
FROM [SalesDemo].[dbo].[Sales]

SELECT Top(3) Region, Product,
SUM(Revenue) AS TotalRevenue
FROM [SalesDemo].[dbo].[Sales]
GROUP BY Region, Product
ORDER BY TotalRevenue DESC;

SELECT Top(3) Region, SUM(Revenue) AS
TotalRevenue
FROM [SalesDemo].[dbo].[Sales]
GROUP BY Region
ORDER BY TotalRevenue DESC;

SELECT Top(3) Product,
SUM(Revenue) AS TotalRevenue
FROM [SalesDemo].[dbo].[Sales]
GROUP BY Product
ORDER BY TotalRevenue DESC;
```

	TotalRevenue
1	97700.00

	Region	Product	TotalRevenue
1	APAC	Product A	25000.00
2	APAC	Product B	15000.00
3	EMEA	Product B	11000.00

	Region	TotalRevenue
1	APAC	47000.00
2	EMEA	26200.00
3	Americas	24500.00

	Product	TotalRevenue
1	Product A	42500.00
2	Product B	36000.00
3	Product C	19200.00

Executive Summary
Total revenue across all regions: $97700
Overall performance highlights:
Top 3 Regions: 1) APAC - $47000; 2) EMEA - $26200; 3) Americas - $24500
Top 3 Products: 1) Product A - $42500; 2) Product B - $36000; 3) Product C - $19200
Top 3 Region-Product Pairs
1) APAC | Product A - $25000
2) APAC | Product B - $15000
3) EMEA | Product B - $11000

Key Insights
Regional performance observations:
- APAC is the top region with $47000, $20800 more than EMEA and $22500 more than Americas;
- EMEA is second with $26200, $1700 ahead of Americas;
- APAC accounts for the largest share of revenue and has the broadest high-value product contributions.

Product performance trends:
- Product A leads with $42500, driven primarily by APAC ($25000) plus Americas ($9500) and EMEA ($8000);
- Product B is second with $36000 and a balanced contribution across regions (APAC $15000, EMEA $11000, Americas $10000);
- Product C trails at $19200 with modest but consistent sales across regions (APAC $7000, EMEA $7200, Americas $5000).

Notable patterns:
- The single largest contributor is APAC | Product A ($25000);
- APAC supplies two of the top three region-product pairs, indicating regional concentration of high-value sales;
- Product A and Product B together make up the majority of revenue compared with Product C;
- All products are sold in every region; there are no zero-revenue combinations in the dataset.

N8n Flow