Summary

Understanding context

The case studies focus on providing insights into **sales performance**, **stock value**, and **supply chain optimization** across various **flavours**, **regions**, and **clients**. The analysis aims to identify key business metrics such as **sales**, **profits**, and **inventory value** to optimize sales and stock management.

Data cleaning and assumption

Provide cleaning steps and some assumptions that might have during the analysis. For this case study, data cleaning was done with M-query. All steps are accessible in shared PBIX file. Home tab > Transform data.

Key Insights and Next steps

Screenshot of dashboard pages, charts and explanations on results.

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Data cleaning and assumptions

1. Table Naming Conventions
Original table names followed the format **“public *tablename*”**, but these were changed to fit the standard **dim** and **fact** table structure for a cleaner data model (e.g., **dim Customer**, **fact Sales**).

2. Duplicate Names for Customers and Flavors:
Some customers and flavors have the same names but different IDs, which could cause confusion in the analysis. To resolve this, ID_name columns were created for both dim Customer and dim Flavor tables to differentiate between entries with identical names but different IDs.

3. Missing Ingredient Data
Dim Ingredients has missing data for ingredient IDs under 100, where costs are marked as 0, potentially skewing cost calculations and leading to a significant difference between sales and ingredient costs.

4. Country Normalization:
Both dim Customer and dim Provider tables contained country names in non-standardized formats (e.g., US vs. United States). To resolve this, normalized country columns were created in each table, allowing for a standardized link to the dim Location table based on a consistent Country ID.

5. Currency Assumptions
USD was assumed as the currency based on the amount_dollar column in the Sales Transaction table, as no explicit currency was provided in the case study. In a real scenario, this would need to be clarified.

6. Dim Dates Table
A Dim Dates table was introduced to enhance time-based analysis, enabling filtering by various periods (e.g., year, quarter, month).

7. Dim Region
The Dim Region table was sourced from a Web API to provide regional data.

8. Fiscal/Calendar Year:
For simplicity, the calendar year was used, with a default year-end of December 31st, as no specific fiscal year details were provided.

9. Outdated Recipe Data:
The Current_version flag in the Recipe table was used to filter out outdated recipes from cost calculations.

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Screenshots of report's pages

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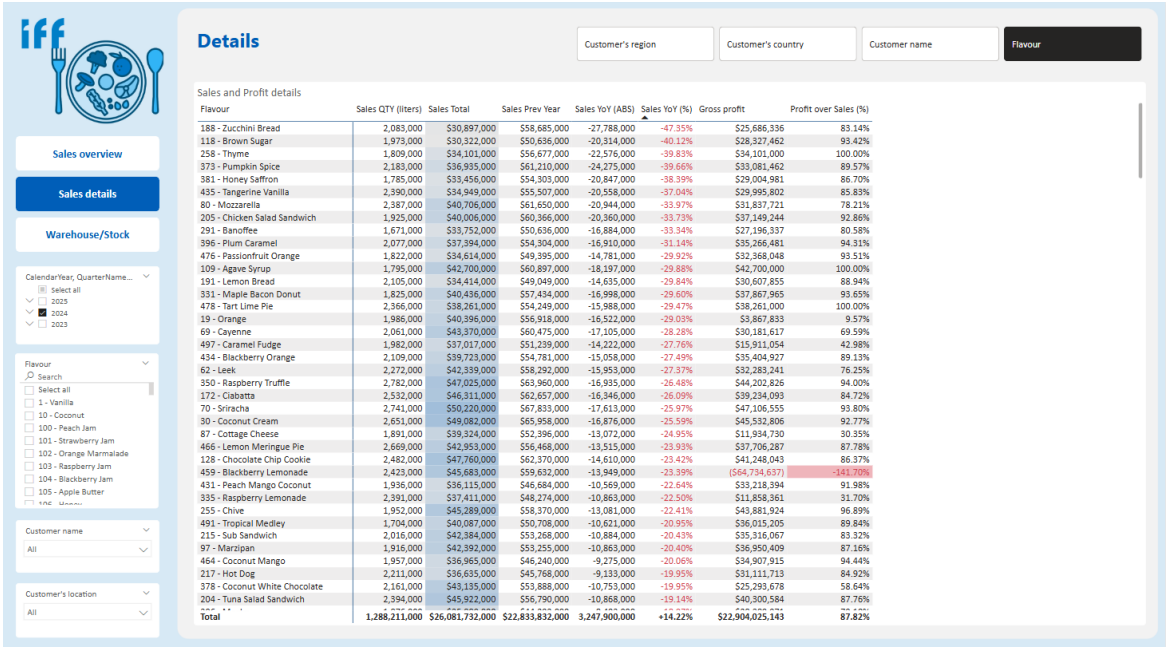
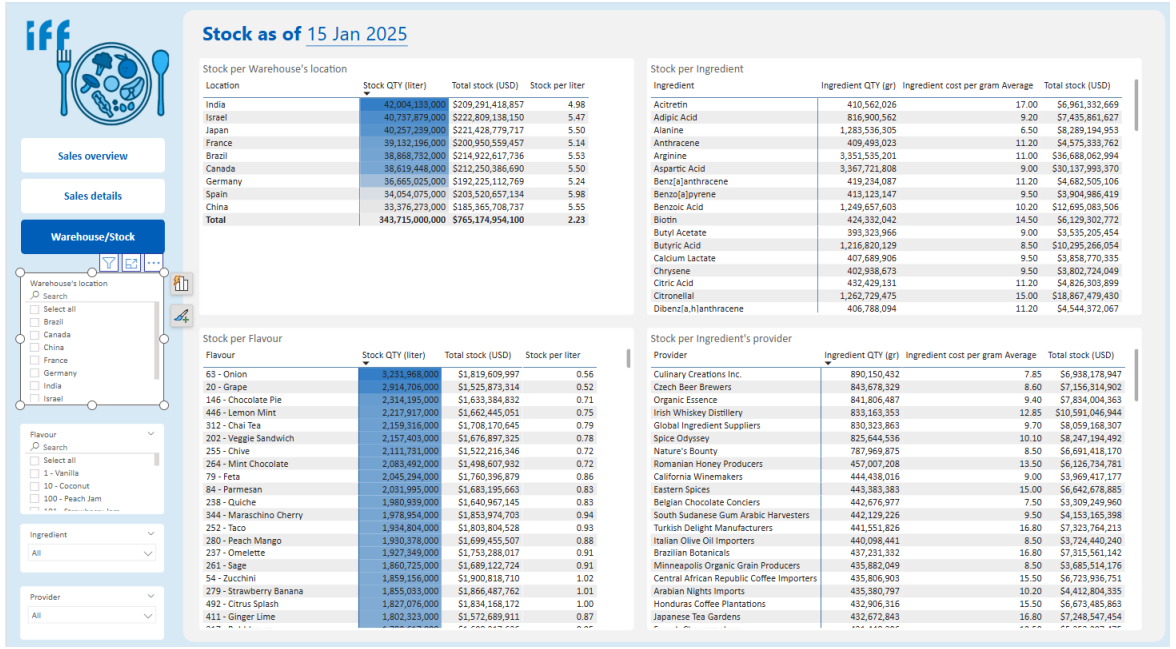


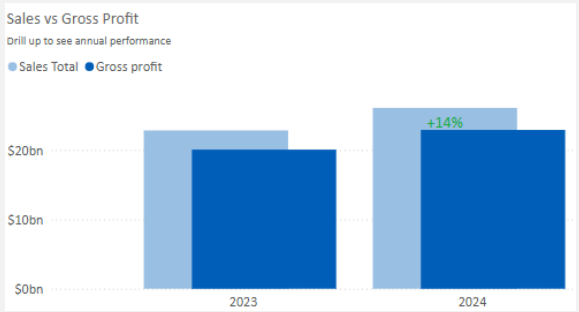


Key Insights

Suggestions

Did we improve sales from one year to the next or did we underperform? For which flavor/client/region?

Sales Improved Globally: Overall sales **showed a positive improvement** from 2023 to 2024. Assuming the company has a target of 15% growth annually, this performance is closed to the target.



Regional Trends: **All regions displayed positive trends**. Europe had highest sales values, but YoY growth was about 12%. While South America had a highest growth of more than 20%, implying a growing market.

Sales and Profit details

Customer's region	Sales QTY (liters)	Sales Total	Sales Prev Year	Sales YoY (ABS)	Sales YoY (%)
South America	17,957,000	$364,902,000	$300,389,000	64,513,000	+21.48%
Asia	262,907,000	$5,324,216,000	$4,481,361,000	842,855,000	+18.81%
Oceania	86,200,000	$1,756,656,000	$1,494,843,000	261,813,000	+17.51%
North America	240,311,000	$4,921,289,000	$4,300,538,000	620,751,000	+14.43%
Europe	631,015,000	$12,732,668,000	$11,358,976,000	1,373,692,000	+12.09%
Africa	32,207,000	$631,608,000	$575,673,000	55,935,000	+9.72%
EuropeAsia	17,614,000	$350,393,000	$322,052,000	28,341,000	+8.80%
Total	**1,288,211,000**	**$26,081,732,000**	**$22,833,832,000**	**3,247,900,000**	**+14.22%**

Flavour Trends: Some showed declines flavours (**e.g., Zucchini Bread and Brown Sugar** of -47% and -40%.

Sales and Profit details

Flavour	Sales QTY (liters)	Sales Total	Sales Prev Year	Sales YoY (ABS)	Sales YoY (%)
188 - Zucchini Bread	2,083,000	$30,897,000	$58,685,000	-27,788,000	-47.35%
118 - Brown Sugar	1,973,000	$30,322,000	$50,636,000	-20,314,000	-40.12%
258 - Thyme	1,809,000	$34,101,000	$56,677,000	-22,576,000	-39.83%
373 - Pumpkin Spice	2,183,000	$36,935,000	$61,210,000	-24,275,000	-39.66%
381 - Honey Saffron	1,785,000	$33,456,000	$54,303,000	-20,847,000	-38.39%
435 - Tangerine Vanilla	2,390,000	$34,949,000	$55,507,000	-20,558,000	-37.04%
80 - Mozzarella	2,387,000	$40,706,000	$61,650,000	-20,944,000	-33.97%
205 - Chicken Salad Sandwich	1,925,000	$40,006,000	$60,366,000	-20,360,000	-33.73%
291 - Banoffee	1,671,000	$33,752,000	$50,636,000	-16,884,000	-33.34%

Customer Trends: Some clients (**e.g., Luminous Solutions, Reliable Systems**) also showed sales declines, but these were relatively smaller.

Sales and Profit details

Customer name	Sales QTY (liters)	Sales Total	Sales Prev Year	Sales YoY (ABS)	Sales YoY (%)	G
39 - Luminous Solutions	16,188,000	$347,874,000	$367,537,000	-19,663,000	-5.35%	
18 - Reliable Systems	18,254,000	$349,731,000	$358,469,000	-8,738,000	-2.44%	
57 - Data Dynamics	15,973,000	$312,076,000	$319,839,000	-7,763,000	-2.43%	
34 - Galaxy Solutions	16,136,000	$315,286,000	$321,245,000	-5,959,000	-1.85%	
15 - Open Source Solutions	17,066,000	$340,459,000	$346,198,000	-5,739,000	-1.66%	
1 - Acme Corp	16,733,000	$330,961,000	$334,464,000	-3,503,000	-1.05%	
49 - Vanguard Innovations	17,340,000	$330,454,000	$333,292,000	-2,838,000	-0.85%	
54 - Azure Technologies	15,700,000	$336,475,000	$336,905,000	-430,000	-0.13%	
9 - Innovative Designs	18,291,000	$339,334,000	$330,187,000	9,147,000	+2.77%	
22 - Vanguard Technologies	16,039,000	$310,560,000	$301,745,000	8,815,000	+2.92%	

Deeper analysis needs to be done to understand the negative trends of those customers/flavours

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Key Insights

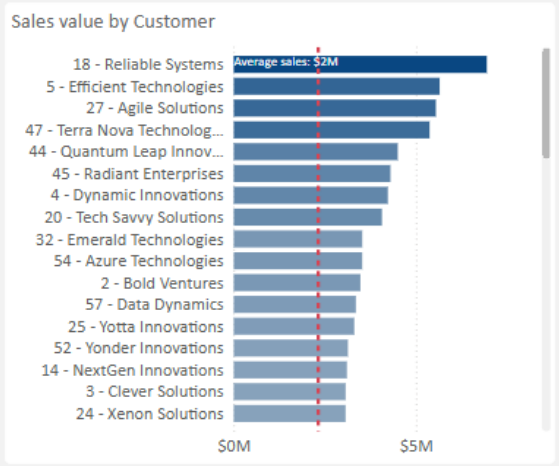
Suggestions

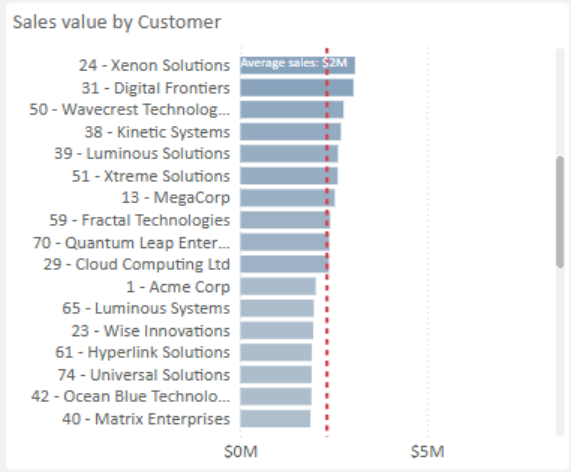
Which clients are top consumers and which clients still have potential (i.e. above or below average) w.r.t. a particular flavour?

To get this information, a flavour should be selected from Flavour slicer on the left.

For example, with regards to **337-Lemon Drop** flavour, the top customer is **18-Reliable Systems.**

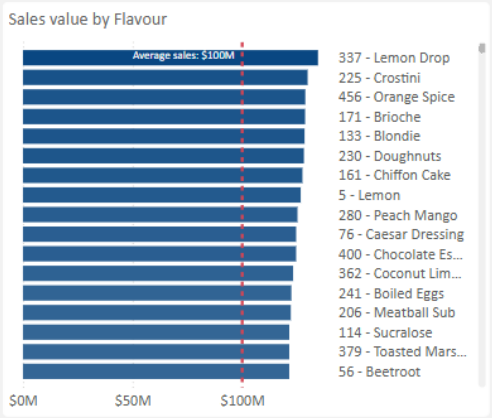
Top 3 clients who still have potential with values closed to the average line on the lower bound are **59-Fractal Technologies, 70-Quantum Leap Entertainment, 29-Cloud Computing.** Those clients could present opportunities for growth.





Are there any relations between any 2 flavours in terms of sales (in general/ per client, globally/per country/per region)? In other words, is there a chance that any 2 flavours to be bought together?

Due to the time constraint of me working full-time, this analysis hasn't been done within the scope of this case study. However, I had a similar correlation analysis and customer segmentation showcased on my website at www.tranhuynh.nl > Market Segmentation (Python) (or via this link)



Bonus: could you help recommend new flavours to any new client based on the previous analysis?

New flavour could be recommended for new customer based on selection of their location.

For instance, based on the most completed data (2024), new clients in **Germany** are recommended to **110-Maple Syrup** flavour.

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Key Insights

Suggestions

What are the different amounts of flavours and the respective ingredients for a given region/country and how much do they cost at any given period?

As of latest data point in the sample, with selection of Stock's location in **Germany**, for example, **396-Plum Caramel, 63-Onion** are flavours having the highest stock quantities.

Sales team in Europe should boost sales performance for flavours with high quantities

However, **253-Mushroom, and 76-Caesar Dressing** have higher figures in term of values.

Attention should be paid to those flavours in term of storage conditions to avoid being expired, potentially causing high financial loss due to expired products.

Stock per Flavour

Flavour	Stock QTY (liter)	Total stock (USD)	Stock per liter
396 - Plum Caramel	1,031,866,000	$1,784,805,334	1.73
63 - Onion	950,727,000	$1,819,609,997	1.91
482 - Peach Apricot Jam	848,403,000	$1,903,663,143	2.24
228 - Breadsticks	696,009,000	$1,708,375,367	2.45
446 - Lemon Mint	685,991,000	$1,662,445,051	2.42
381 - Honey Saffron	677,505,000	$1,689,404,680	2.49
253 - Mushroom	609,506,000	$1,915,423,456	3.14
115 - Xylitol	540,202,000	$1,733,552,957	3.21
255 - Chive	539,849,000	$1,522,216,346	2.82
76 - Caesar Dressing	525,654,000	$1,870,797,065	3.56
490 - Cinnamon Peach	515,109,000	$1,838,214,325	3.57
45 - Plum	514,331,000	$1,755,669,261	3.41
14 - Banana	506,574,000	$1,678,424,424	3.31
35 - Green Tea	504,163,000	$1,869,815,408	3.71
124 - Molasses Cookies	495,272,000	$1,661,628,805	3.35
330 - Apricot Jam	488,525,000	$1,691,501,489	3.46
209 - Gyro	486,212,000	$1,609,650,611	3.31
183 - Multigrain Bread	480,993,000	$1,736,070,608	3.61

Next steps

1. Implement Flavour Correlation
2. Implement Sales Forecasting models
3. Add Stock Value Visualizations and create a more interactive dashboard to monitor supply chain operations
4. Continue developing Customer Segmentation and product recommendations based on purchasing patterns.

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