



ORACLEMETRICS

AI-POWERED REAL-TIME PERFORMANCE MONITORING IN LARGE-SCALE RETAIL

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ABSTRACT

In today's dynamic large-scale retail (GDO) environment, **real-time performance monitoring** is crucial for maintaining competitiveness and operational efficiency. As market dynamics shift and consumer preferences evolve, GDOs must adapt quickly to stay ahead.

This report highlights the role of **AI-driven dashboards** in tracking key performance indicators (KPIs) such as sales, inventory levels, and customer behavior in real time. These advanced tools transform raw data into actionable insights, empowering retailers to make strategic, data-driven decisions.

This approach enhances **operational efficiency** and **customer satisfaction** by ensuring product availability and targeted promotions. Forecasting models and benchmark comparisons further support proactive decision-making, helping retailers anticipate demand and identify areas for improvement.

Focusing on Monster Energy Drinks, a leading global energy beverage brand, our analysis demonstrates the value of real-time monitoring in a highly competitive market. Through the development of interactive Power BI dashboards and a custom-built application, we provide a comprehensive view of sales trends, stock distribution, and promotional effectiveness. These tools deliver real-time data to managers, enabling them to identify trends, optimize inventory, and refine marketing strategies.

For a brand like Monster Energy, maintaining a strong market presence requires not only meeting consumer demand but staying ahead of it. This report demonstrates that integrating AI-driven analytics into retail operations equips GDOs with the tools needed to navigate the complexities of a rapidly evolving market, driving long-term success through data-driven decision-making and continuous optimization.



Who is Oracle metrics

Oracle Metrics is an **AI-driven consultancy** agency specializing in real-time performance monitoring solutions for the large-scale retail (GDO) sector.

Our mission is to empower retailers with actionable insights derived from advanced data analytics, enabling them to optimize operations and drive profitability. We provide sophisticated AI-powered dashboards that integrate data from various sources, including point-of-sale systems, inventory management software, and customer relationship management (CRM) platforms. This comprehensive approach offers a unified view of retail performance, facilitating informed decision-making.

Our **tailored solutions** address the unique challenges faced by GDOs. By monitoring KPIs such as sales volume, inventory levels, and customer behavior in real time, our dashboards deliver accurate and timely data that support strategic decisions. For example, retailers can adjust pricing strategies, reallocate stock, or launch targeted marketing campaigns based on real-time insights. Our expertise in data science ensures that these insights are both relevant and actionable, driving operational efficiency and enhancing customer satisfaction.

More than just a consultancy agency, Oracle Metrics is a strategic partner committed to **innovation**. Our team of data scientists and industry experts collaborates closely with clients to develop customized solutions that deliver measurable results. By leveraging AI-driven analytics, GDOs can navigate challenges, seize opportunities, and stay ahead in an ever-evolving market. Partnering with Oracle Metrics means gaining the tools and expertise needed for long-term success in the competitive retail landscape.



Who is Oracle metrics

December Income statement

| | |
|----------------------------------|----------------|
| Net revenues | € 2.000.180,00 |
| Cost for services | € 2.300,00 |
| Employee costs | € 26.100,00 |
| Operating income | € 1.974.080,00 |
| Profit before tax | € 1.974.080,00 |
| Taxes for the period | € 473.779,20 |
| Profit for continuing operation | € 1.500.300,80 |
| Net profit/(loss) for the period | € 1.500.300,80 |

The provided table encapsulates OracleMetrics's **income statement** for December, meticulously calculated to reflect the real operational scenario. The company, comprising a software architect, a mobile application developer, a market analyst, a data analyst and sustainability specialist, a forecasting analyst and two business intelligence developer, each contributed for an estimated average of 180 hours total from project assignment to delivery.

Net revenues encompass the proceeds from the software sale to Monster beverage Corporation, as previously described, and the hourly labor cost at €30 for the manager and €25 for other team members . Taxes were computed based on an average tax rate applicable to small/medium enterprises.

The costs of services outlined in the statement encompass administrative and accounting management expenses, providing a comprehensive overview of the company's financial landscape for the specified period.

| | | | | |
|--------------------------------------|--------------|---|-------|---|
| Cost Manager per hour for Monster | 30,00 | € | 25,00 | € |
| Cost employee per hour for Monster | 2.000.000,00 | € | 25,00 | € |
| Revenue for software and application | 20,00 | € | | |
| Cost per hour per person (Manager) | | | | |
| Cost per hour per person | | | | |
| Worked hours | | | 180 | |



Monster Energy Drinks has carved out a dominant presence in the global energy drink market, becoming a staple in supermarkets, hypermarkets, and convenience stores worldwide. Known for its **bold branding** and **dynamic product lineup**, the company has successfully cultivated a strong association with youth culture, extreme sports, and high-energy lifestyles. This strategic positioning has made Monster a go-to choice for consumers seeking both performance and identity alignment, driving consistent demand across diverse demographics.

In the GDO sector, Monster's products are strategically placed to **maximize visibility and consumer engagement**, often featured prominently in-store and during promotional campaigns. Retailers rely on Monster's reputation and popularity to attract foot traffic and boost sales, making the brand a critical component of their beverage offerings. This widespread retail presence requires meticulous inventory management, timely stock replenishment, and responsive distribution strategies to ensure consistent availability and capitalize on peak demand periods.

Given the competitive nature of the energy drink market, real-time performance monitoring becomes essential for maintaining Monster's edge. By staying attuned to market trends and consumer preferences, GDOs can make informed decisions about product placement, pricing, and promotions. This data-driven approach helps ensure that Monster Energy Drinks continue to meet and **exceed consumer expectations**, reinforcing their strong market share and solidifying their position as a leader in the global beverage industry.



The analysis

Our analysis is structured into four key sections: Forecasting, KPI Evaluation, Dashboard Creation, and Mock-up Development.

In the **Forecasting** segment, we delve into predictive models to anticipate future sales trends and demand patterns, enabling proactive decision-making and resource allocation.

The **KPIs Evaluation** section identifies and assesses critical performance metrics, establishing **benchmarks** that help measure success and highlight areas needing improvement.

Dashboard creation focuses on designing intuitive, AI-powered interfaces that consolidate data from multiple sources, transforming complex information into clear, actionable insights.

Finally, the **Mock-up** Development section outlines the conceptual design and functionality of our custom-built application, providing a visual prototype to demonstrate how the system will deliver **real-time performance monitoring** and support strategic decisions.

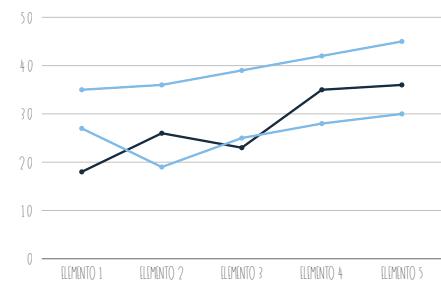
Each part of this analysis contributes to a comprehensive framework that drives **operational excellence** and **competitive advantage**.



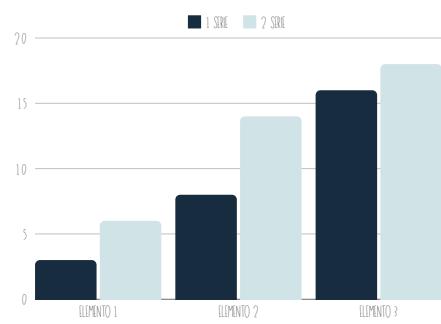


The Index

FORECASTING



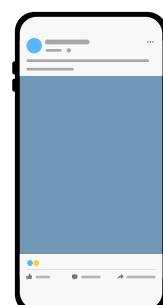
DEFINE KPIs



CREATE DASHBOARDS



BUILD A MOCK-UP





Forecasting

Forecasting is a fundamental tool for planning a company's future based on historical trends and strategic projections. For Energy Monster Drink, we developed forecasts for the years 2024, 2025, and 2026 using two key methodologies: CAGR (Compound Annual Growth Rate) and SGR (Sustainable Growth Rate). These predictive indices allowed us to build realistic scenarios while minimizing the risks associated with overly simplistic projections.

The main objective was to identify a sustainable growth path by incorporating a logarithmic approach with log(2) and log(3) for the 2025 and 2026 forecasts. This ensured a more accurate representation of market dynamics and added realism to our model.

COMPOUNDED AVERAGE GROWTH RATE (CAGR):

CAGR represents the average annual growth rate, calculated using the formula:

$$CAGR = \left(\frac{\text{Final Value}}{\text{Initial Value}} \right)^{\frac{1}{\text{Years}}} - 1$$

To implement this, a specific column was created where the CAGR for each financial metric was calculated retroactively for the years 2019-2023. The calculated CAGR was then applied to project future values for 2024, 2025, and 2026.

For 2024, the classical CAGR formula was used to provide a steady and reliable growth projection.

$$\text{Forecast Value} = 2023 \text{ Value} \times (1 + CAGR)^{\text{Years to forecast}}$$



Forecasting

For 2025 and 2026, the formula was adapted to include a logarithmic base $\log(2)$, introducing non-linearity and creating more realistic growth projections for mature markets like energy drinks.

The classical CAGR approach is particularly useful for representing steady growth based on consolidated historical performance. For example, Energy Monster Drink's revenue showed a CAGR of 11% from 2019 to 2023, enabling us to forecast \$7,939,132.15 for 2024. However, using $\log(2)$ and $\log(3)$ for 2025 and 2026 provided more robust and accurate predictions, addressing potential market saturation and competitive challenges.

| Year | 2019 | 2020 | 2021 | 2022 | 2023 | CAGR | 2024 | 2025 | 2026 |
|--|----------------|----------------|----------------|----------------|----------------|------|----------------|----------------|----------------|
| Net sales | \$4,200,619.00 | \$4,596,638.00 | \$5,541,352.00 | \$6,311,050.00 | \$7,140,027.00 | 11% | \$7,939,132.15 | \$8,206,609.42 | \$8,644,833.87 |
| Cost of sales | 1,682,234.00 | 1,874,758.00 | 2,432,839.00 | 3,136,483.00 | 3,345,821.00 | 15% | 3,839,069.39 | 4,009,441.58 | 4,291,458.80 |
| Gross profit | 2,518,585.00 | 2,723,880.00 | 3,108,513.00 | 3,174,567.00 | 3,794,206.00 | 9% | 4,118,260.03 | 4,224,141.53 | 4,396,274.38 |
| Gross profit as a percentage of net sales | 60.00% | 59.20% | 56.10% | 50.30% | 53.10% | -2% | 51.82% | 51.44% | 50.85% |
| Operating expenses | 1,115,646.00 | 1,090,727.00 | 1,311,046.00 | 1,589,846.00 | 1,840,851.00 | 11% | 2,034,778.23 | 2,099,306.05 | 2,204,823.60 |
| Operating expenses as a percentage of net sales | 27% | 24% | 24% | 25% | 26% | -1% | 26% | 26% | 26% |
| Operating income | 1,402,939.00 | 1,633,153.00 | 1,797,467.00 | 1,584,721.00 | 1,953,355.00 | 7% | 2,087,034.64 | 2,130,030.19 | 2,199,580.42 |
| Operating income as a percentage of net sales | 33% | 36% | 32% | 25% | 27% | -4% | 26% | 26% | 26% |
| Interest and other income(expense) | 13,023.00 | -6,998.00 | 3,952.00 | -12.76 | 115,127.00 | 55% | 178,020.66 | 207,296.54 | 261,328.48 |
| Income before provision for income taxes | 1,415,962.00 | 1,626,157.00 | 1,801,419.00 | 1,584,708.24 | 2,068,482.00 | 8% | 2,231,370.95 | 2,284,266.78 | 2,370,092.11 |
| Provision for income taxes | 308,127.00 | 216,563.00 | 423,944.00 | 380,340.00 | 437,494.00 | 7% | 469,267.60 | 479,527.06 | 496,143.44 |
| Income taxes as a percentage of income before taxes | 21.80% | 13.30% | 23.50% | 24.20% | 21.20% | -1% | 21.08% | 21.05% | 20.99% |
| Net income | \$1,107,835.00 | \$1,409,594.00 | \$1,377,475.00 | \$1,204,368.24 | \$1,630,988.00 | 8% | \$1,762,162.29 | \$1,804,825.51 | \$1,874,082.23 |
| Net income as a percentage of net sales | 26.40% | 30.70% | 24.90% | 18.90% | 22.60% | -3% | 22.14% | 21.95% | 21.65% |
| Net income per common share: | | | | | | | | | |
| Basic | \$2.04 | \$2.66 | \$2.61 | \$1.13 | \$1.56 | -5% | \$1.48 | \$1.46 | \$1.42 |
| Diluted | \$2.03 | \$2.64 | \$2.57 | \$1.12 | \$1.54 | -5% | \$1.48 | \$1.43 | \$1.40 |
| Weighted average number of shares of common stock and common stock equivalents | | | | | | | | | |
| Basic | 542,191.00 | 529.64 | 528,763.00 | 1,053,558.00 | 1,044,887.00 | 14% | 1,191,386.65 | 1,241,670.65 | 1,324,732.66 |
| Diluted | 546,608.00 | 534.81 | 535,639.00 | 1,066,442.00 | 1,057,981.00 | 14% | 1,207,364.06 | 1,258,682.28 | 1,343,476.91 |
| Energy Drink Case sales(in thousands)(in 192-ounce case equivalents) | 448,770.00 | 504.82 | 132,340.00 | 701,677.00 | 769,241.00 | 11% | 856,781.63 | 886,132.91 | 934,247.29 |
| Average net sales per case | \$9.31 | \$9.06 | \$8.99 | \$8.82 | \$9.01 | -1% | \$8.95 | \$8.93 | \$8.91 |



Forecasting

SUSTAINABLE GROWTH RATE (SGR)

The SGR measures the maximum growth rate an organization can achieve without needing external capital, relying solely on retained earnings.

We used the SGR calculated in the KPI section to develop a forecasting model for the individual items of various financial statements.

The objective was to highlight the differences in using this index compared to other methodologies.

For 2024, the classical SGR was employed to provide a standard projection.

For 2025 and 2026, however, a modification was introduced by applying a logarithmic base $\log(2)$ and $\log(3)$ to add a non-linear dimension to the model. This approach considers more mature market dynamics and structural limitations, thereby improving the accuracy of the forecasts. The formulae applied for 2025 and 2026 are respectively:

$$\text{Forecast Value} = 2024 \text{ Value} \times (\text{SGR} \cdot \log(2))^{t-2024}$$

| 2024 | 2025 | 2026 |
|----------------|----------------|----------------|
| \$8,291,670.93 | \$8,694,267.62 | \$9,116,412.12 |
| 3885482.05 | 4074139.10 | 4271956.27 |
| 4406188.88 | 4620128.52 | 4844455.85 |
| 61.66% | 64.66% | 67.80% |
| 2137769.33 | 2241567.33 | 2350405.17 |
| 29.96% | 31.42% | 32.94% |
| 2268419.55 | 2378561.19 | 2494050.68 |
| 31.82% | 33.36% | 34.98% |
| 133696.30 | 140187.84 | 146994.57 |
| 2402115.86 | 2518749.03 | 2641045.25 |
| 508059.18 | 532727.67 | 558593.91 |
| 24.62% | 25.81% | 27.07% |
| \$1,894,056.67 | \$1,986,021.36 | \$2,082,451.34 |
| 26.48% | 27.76% | 29.11% |
| \$1.81 | \$1.90 | \$1.99 |
| \$1.79 | \$1.88 | \$1.97 |
| 1213421.06 | 1272337.93 | 1334115.48 |
| 1228627.05 | 1288282.24 | 1350833.94 |
| 893315.00 | 936689.33 | 982169.67 |
| \$10.46 | \$10.97 | \$11.50 |



Forecasting

IMPORTANCE OF USING LOG(2) AND LOG(3) IN FORECASTS

The introduction of log(2) and log(3) for the 2025 and 2026 forecasts was a strategic choice to enhance prediction accuracy. The main reasons include:

- ***Representation of Sustainable Growth***

By using log(2) and log(3), the model better captures market dynamics, reducing the excessive linearity typical of classic formulas. This is particularly important for mature sectors like energy drinks, where growth gradually slows due to market saturation.

- ***Reduction of Overestimation Risk***

Traditional CAGR and SGR formulas can produce overly optimistic estimates. The logarithmic approach moderates the projected growth, making the forecasts more realistic.

- ***Adapting to Real Market Dynamics***

The energy drink market is characterized by an initial rapid growth cycle, followed by a stabilization phase. The use of log(2) and log(3) reflects this transition, providing a non-linear growth curve that better represents reality.

- ***Analytical Robustness***

Incorporating log(2) and log(3) makes the predictive model more flexible and capable of responding to uncertainties by considering both external factors and internal factors.



Forecasting

COMPARING CAGR AND SGR IN FORECASTS:

Calculating both CAGR and SGR on the same data allows to analyze the company's growth from two different perspectives. Using the same data, it helps us understand:

- Whether the company is growing at a sustainable rate ($CAGR \leq SGR$).
- Whether the company is exceeding its internal capacity, potentially relying on external capital ($CAGR > SGR$).

Projections from Two Perspectives

CAGR provides a forecasting baseline to estimate a linear average growth. SGR, on the other hand, helps assess whether that growth is realistically achievable based on internal profitability and financial structure.

Analysis of Differences

If CAGR-based projections (growth forecasts) are significantly higher than SGR-based projections (sustainability forecasts), it indicates that:

- The company may grow, but it risks relying on external funding sources.
- Strategies could be implemented to align growth with sustainability, such as increasing retained earnings for reinvestment.

Robustness Check

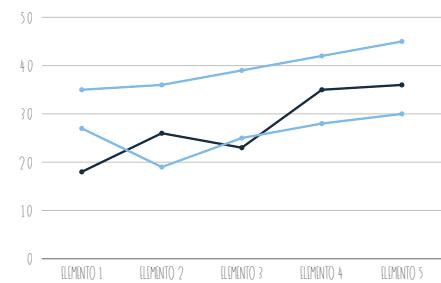
Applying both CAGR and SGR to historical data helps verify if:

- CAGR-based forecasts respect the sustainability limits imposed by SGR.
- There are discrepancies requiring further strategic analysis.

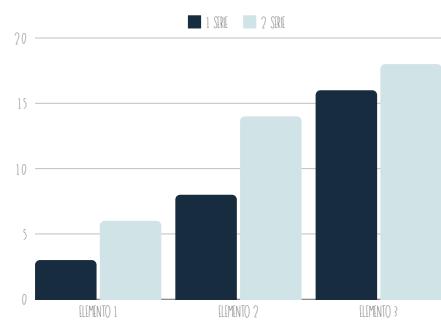


The Index

FORECASTING



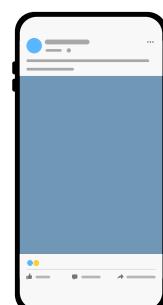
DEFINE KPIs



CREATE DASHBOARDS



BUILD A MOCK-UP





KPI analysis

KPI, which stands for Key Performance Indicator, is a measurable metric that evaluates how effectively a company or individual meets essential business goals. KPIs are vital for tracking progress, enabling organizations to assess performance and make informed, data-driven decisions. By consistently monitoring and analyzing KPIs, businesses can enhance their operations.

To help Monster, we assessed profitability KPIs and other metrics that will be elaborated on in the next section.

Here are the definitions of the metrics:

- Return on Equity (**ROE**): This is a comprehensive measure of a firm's performance and makes possible the comparison among companies of different sizes. Represents the rate of return earned by shareholders generated per dollar of shareholders' equity deployed.

$$\frac{\text{Net Income}}{\text{Shareholders Equity}}$$

To better understand how the company generates profits (loss), it's useful to break the ROE into three component, following the **DuPont model**.

$$ROE = ROA \times Leverage = \frac{\text{Net Income}}{\text{Avg. Assets}} \times \frac{\text{Avg. Assets}}{\text{Sh. Equity}}$$



KPI analysis

- Return on Assets (**ROA**): Is a measure of total firm profitability, it provides a perspective of how efficiently the managers use the firm's assets to generate income. A high ROA suggests that managers generate more dollars of net income per dollar of economic resources.

$$ROA = \frac{Net\ Income}{Avg.\ Assets}$$

The ROA can be further broken down to ultimately decompose into Return on Equity (ROE):

$$ROE = \frac{Net\ Income}{Sales} \times \frac{Sales}{Avg.\ Assets} \times \frac{Avg.\ Assets}{Sh.\ Equity}$$

- **Net Profit Margin:** is a profitability ratio calculated by dividing net income by sales and expressing the result as a percentage. A higher net profit margin indicates a more profitable business operation, reflecting how efficiently a company converts revenue into profit after accounting for all expenses.
- **Asset Turnover Ratio:** provides a perspective on how efficiently a firm uses its assets to generate sales. Specifically, it measures the amount of sales generated for each dollar of assets.
- **Leverage:** This element captures the effects of a firm's capital structure on ROE, in particular, captures the effect of both financing and operating liabilities.



KPI analysis

- **Gross Profit Margin:** is a profitability ratio that measures the percentage of revenue retained by a company after deducting the cost of goods sold. It provides insights into the efficiency of the production process. It highlights the profitability of a company's core business activities. A higher gross profit margin suggests effective cost management and pricing strategies.

$$\frac{Sales - COGS}{Sales}$$

- **Operating Profit Margin:** is a profitability ratio that assesses a company's ability to generate profit from its core operations. It is calculated by dividing operating profit by sales and is expressed as a percentage. A higher margin indicates better operational efficiency.

$$\frac{Sales - COGS - SG\&A}{Sales}$$

- **A/R Turnover Ratio:** This ratio provides perspective on how efficiently a firm collects cash from customer. To enhance clarity, we also calculated the **days sales outstanding**, which indicates the average number of days the company takes to collect its receivables.

$$\frac{Sales}{Avg. A/R}$$



KPI analysis

- **Inventory Turnover Ratio:** This ratio captures how many times a year a firm turns over (or cycles through) its inventory. Similar to previous calculations, we determine the **days inventory outstanding**, which reveals the average number of days it takes for the company to replenish its inventory.

$$\frac{COGS}{Avg. Inventory}$$

- **Net Income Growth:** This index expresses the percentage increase in net income from one year to the next. It can provide a quick insight into the company's financial trend.

Let's now delve into the other part of the KPIs analyzed, specifically those related to **customer behavior**. Our focus is on understanding consumption trends to optimize the product assortment effectively.

Before proceeding further, it is essential to examine the percentage of products sold by category:



KPI analysis

- **Sales Growth:** This index measures the percentage increase in sales over a specific period, in our case we considered one year. It provides insight into the company's revenue growth trend.

$$\frac{\text{Sales}(\text{Year}(n)) - \text{Sales}(\text{Year}(n-1))}{\text{Sales}(\text{Year}(n-1))} \times 100$$

- **Dead Stock (%):** The percentage of inventory that remains unsold or stagnant for a prolonged period, in our case we considered again at least one year, indicating inefficiencies in stock management or mismatched demand.

$$\frac{\text{Ending Inventory}}{\text{Unsold Stock}}$$

- **Sales Velocity:** The rate at which products are sold over a specific time frame, helping evaluate the performance of different categories and overall inventory turnover.



KPI analysis

- **Average Margin:** The profit margin percentage, respectively for Category A,B and C, calculated as the ratio of profit to sales in that category. This can be useful to understand how different category of products sells to the customers.

$$\frac{\text{SalesCategory (A)}}{\text{TotalSales}}$$

- **Total Margin Growth:** The percentage increase in the overall gross margins of the company over a period, showing improvements or declines in profitability. We considered one year period for the analysis.





KPI analysis

| YEAR | 2019 | 2020 | 2021 | 2022 | 2023 | 2024F | 2025F | 2026F |
|-----------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| ROA | 21,51% | 24,83% | 19,67% | 14,96% | 18,14% | 17,04% | 16,09% | 15,88% |
| ROE | 26,56% | 33,01% | 26,18% | 18,26% | 23,04% | 21,22% | 19,11% | 18,98% |
| Net Profit Margin | 26,37% | 30,65% | 24,86% | 19,08% | 22,84% | 22,20% | 21,99% | 21,68% |
| Asset turnover ratio | 0,82 | 0,81 | 0,79 | 0,78 | 0,79 | 0,77 | 0,73 | 0,73 |
| Leverage | 1,23 | 1,33 | 1,33 | 1,22 | 1,27 | 1,25 | 1,19 | 1,20 |
| Gross Margin ratio | 59,95% | 59,23% | 56,10% | 50,30% | 53,14% | 51,87% | 51,47% | 50,85% |
| Operating Profit Margin | 33,40% | 35,51% | 32,44% | 25,11% | 27,36% | 26,29% | 25,96% | 25,44% |
| A/R turnover ratio | 7,77 | 6,90 | 6,18 | 6,21 | 5,98 | 5,67 | 5,58 | 5,43 |
| Days Sales Outstanding | 46,95 | 52,86 | 59,06 | 58,77 | 61,04 | 64,32 | 65,45 | 67,22 |
| Inventory turnover ratio | 4,66 | 5,63 | 4,10 | 3,35 | 3,44 | 3,24 | 3,18 | 3,08 |
| Days Inventory Outstanding | 78,27 | 64,85 | 89,02 | 108,88 | 105,97 | 112,59 | 114,92 | 118,59 |
| Net Income Growth | - | 27% | -2% | -13% | 35% | 8% | 2% | 4% |

As previously mentioned, to better understand the fluctuations in ROA and ROE, we need to examine the Net Profit Margin, the Asset Turnover Ratio, and Leverage.

From the table provided, it is evident that the primary driver of changes in ROA and ROE is the variation in the Net Profit Margin. For instance, if we focus on the difference between 2020 and 2021, we can see that the decrease in the Net Profit Margin directly corresponds to the decline in both ROA and ROE. The primary reason for this, is the increase in COGS, which outpaces the growth in net sales. This shift was a direct consequence of the COVID-19 pandemic, which led to changes in consumer channel preferences and packaging configurations. Specifically, customers began favoring at-home consumption, resulting in increased demand for aluminum and packaging materials needed for shipments, thereby driving up costs.

The growth in net sales was primarily driven by the increased global sales volume of Monster Energy® brand energy drinks, reflecting heightened consumer demand.



KPI analysis

We can better assess this increment, looking at the Sales Growth index in the next pages.

Starting in 2023, we observe an upward trend, primarily driven by changes in the Net Profit Margin. However, from 2024F onward, a slight decline is evident over the year. This decline stems from the fact that the Compound Annual Growth Rate (CAGR) of net income is lower than that of net sales, resulting in a reduced Net Profit Margin.

A similar pattern is observed with leverage, where growth slows down as total assets and shareholders' equity adjust at different rates.

Since a logarithmic trend was used for forecasting future years, this pattern is expected to persist. In particular, to motivate this trend, we need to have a look at what happened between 2021 and 2022: given the increase in demand in the first year, the company invested in production, but did not experience the same level of increase in demand. This led to an increase in finished product inventories and subsequently to an increase in operating and stock management costs, which resulted in a lower final result for the year 2022.

This analysis highlights the importance of closely monitoring the relationship between income growth, sales expansion, and leverage to ensure sustainable financial performance in the long term.



KPI analysis

From 2019 to 2022, the **Gross Margin Ratio** shows a steady decline. This reduction reflects increasing costs relative to sales, driven by higher production expenses or cost of goods sold. However, starting in 2023, there is a recovery, followed by a gradual decline in the forecasted years, reaching 50.85% by 2026F, indicating a stabilization at slightly lower levels.

The **Operating Profit Margin** follows a similar trajectory. Again, this drop highlights pressure on profitability from operational costs. Recovery begins in 2023, with the margin climbing up a little bit, before slightly declining the following forecasted years, mirroring the Gross Margin trend.

Net Income Growth highlights the company's challenges, with a decline of 13% in 2022 after prior years of volatility. A strong recovery occurs in 2023 (35%), but growth slows significantly in the forecasted period, with CAGR tapering off to 2-4% annually from 2024F to 2026F. This indicates limited future growth in profitability relative to previous years, supposing that they don't make any substancial changes in their strategies.



KPI analysis

The **Accounts Receivable Turnover Ratio (A/R Turnover)** provides insight into a company's ability to collect receivables in a timely manner. From 2019 to 2026F, the ratio shows a gradual decrease from 7.77 to 5.43.

This decrease indicates that the company is taking longer to collect receivables from customers. Potential causes for this slowdown include more relaxed business policies, more generous credit terms, or an increase in late payments from customers. However, this slowdown could also have negative implications for cash flow, as lower turnover indicates capital locked up in receivables.

To make this index easier to understand, we calculated the **Days Sales Outstanding (DSO)**, which measures the average days it takes to collect receivables.

The **Inventory Turnover Ratio**, which measures the rate at which inventory is sold or used, is projected to decline from 4.66 in 2019 to 3.08 in 2026F.

This decrease indicates a slowdown in the inventory turnover cycle, which supports the earlier analysis that the company is experiencing difficulty selling its products and holding excessive inventory, due to the increase in 2021.

As with the A/R turnover, we have calculated the **Days Inventory Outstanding (DIO)**, that provides a more straightforward representation of the inventory turnover ratio. As illustrated, the average number of days required to sell inventory has increased significantly, from 78.27 days in 2019 to 118.59 days in 2026F.



KPI analysis

| YEAR | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---------------------------|-------|-------|--------|--------|--------|--------|-------|-------|
| Sales Growth g | - | 9,47% | 20,50% | 13,89% | 13,14% | 11,19% | 3,37% | 5,34% |
| Sustainability growth g* | - | 24% | 27% | 7% | 17% | 15% | 4% | 7% |
| Dead Stock (%) | 11% | 17% | 9% | 8% | 8% | 8% | 8% | 7% |
| Sales Velocity | 13,16 | 13,26 | 11,96 | 8,26 | 7,49 | 6,68 | 6,43 | 6,05 |
| Average Margin Category A | 50% | 55% | 58% | 58% | 55% | 56% | 56% | 57% |
| Average Margin Category B | 30% | 17% | 33% | 30% | 32% | 32% | 33% | 33% |
| Average Margin Category C | 20% | 28% | 9% | 12% | 13% | 12% | 12% | 11% |
| Total Margin Growth | - | 8% | 14% | 2% | 20% | 9% | 3% | 4% |

Let's forget for a minute about the analysis between sustainability growth and actual growth.

Let's start with the **Dead Stock (%)**: we can easily observe a decreasing trend on the percentage of unsold inventory from 11% to 7% over time, with the biggest gap in among 2020 and 2021. This drop is again caused from the increasing of Monster consumption during the pandemic, that from there after it started to slow down.

This decline suggests that customers are increasingly purchasing available products, likely reflecting improved alignment between inventory and demand.

Sales velocity has steadily decreased from 13.16 to 6.05 over time. This decline indicates a slowdown in the rate at which products are being sold. Again, the higher values can be found during the pandemic years.

A deeper analysis can investigate whether the decrease is due to external factors (e.g., market trends) or internal ones (e.g., pricing strategies, product selection).



KPI analysis

Average Margin by Category A: Margins improved from 50% to 57%, peaking at 58%. This high and stable margins suggest strong customer willingness to pay premium prices and it indicate loyalty and high perceived value, without forgetting that Category A is the Monster original.

As for **Category B**, margins showed fluctuations, initially dropping from 30% to 17% but then stabilizing around 33%.

These fluctuations may reflect experimentation with pricing or promotions to capture and maintain market share. The recovery and stability imply customers now see sufficient value in this category.

The margins for **Category C** declined from 20% to 11%, with brief increases to 28%. Consistently lower margins suggest price sensitivity in this category. Customers may prioritize affordability or perceive limited differentiation among products.

Considering the **Total Margin Growth** we observe that margins have grown inconsistently, with spikes of 20% and 14%, but also periods of lower growth (2%-4%). The lowest value (2%) is encountered in the 2022, this is due to the high COGS with respect to the lower sales, caused by the post pandemic decrease that we have defined previously.

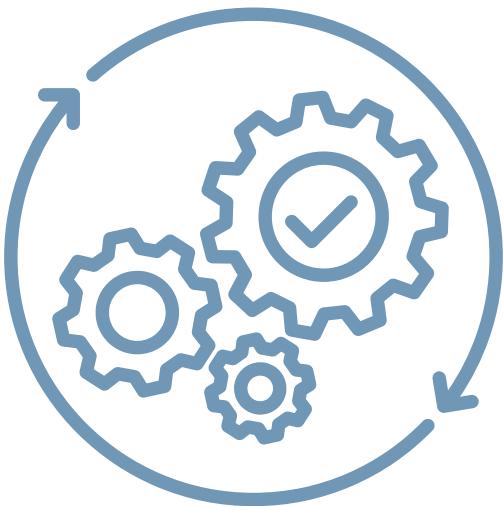


KPI analysis

Customer Behavior Insight

The fluctuating margin growth reflects changes in customer spending patterns, pricing strategies, and product performance. Sharp increases may indicate successful campaigns or product launches, while slower growth could point to market saturation or external factors. It is worth noting, however, that Monster remains one of the **largest companies** in the energy drink sector, leveraging extensive advertising efforts—including sports-related campaigns—and a strong base of loyal customers.

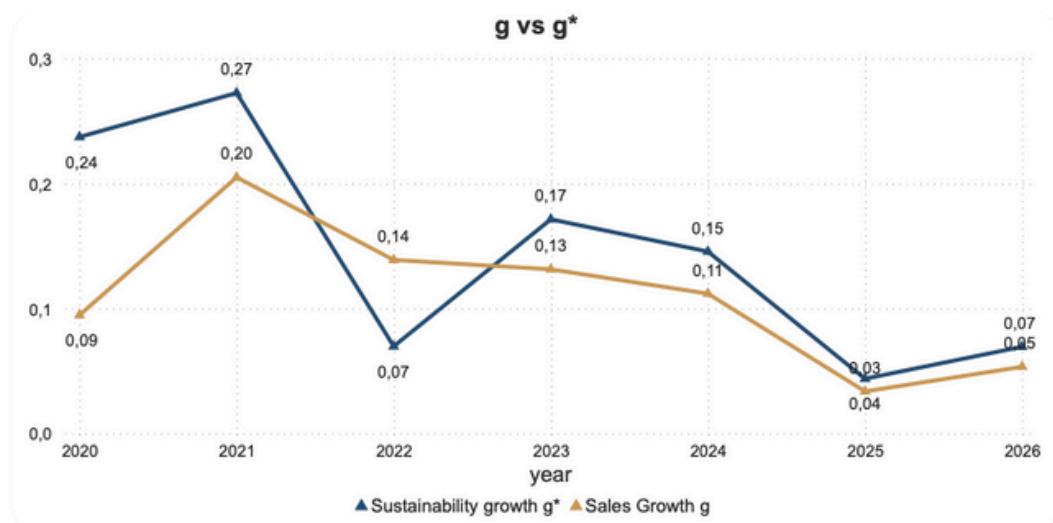
Anyway, **monitoring** customer preferences across categories and **fine-tuning strategies** will be essential to sustain growth and margin improvements.





KPI analysis

Sustainability growth vs Actual growth



From the graph, it is evident that sustainable growth consistently exceeded actual growth, with the exception of 2022. Actual growth is calculated based on the percentage increase in sales between two consecutive years.

The year 2022 was marked by an operating performance heavily impacted by higher operational costs, which exerted pressure on the overall profitability of the business. Moreover, a strategic decision to implement a stock repurchasing plan further contributed to a reduction in equity value.

This combination of factors not only altered the equity structure but also resulted in a significant decline in the company's sustainable growth potential. However, this strategy was not repeated in subsequent years, alleviating any long-term concerns.



Benchmark analysis

The energy drink market is in constant growth, the demand is to have drinks in convenient storage solutions that will boost focus and energy. The clientele is mostly composed of younger people. Especially for the 18-34 years old, that enter the work field and value caffeine boost. This expansion can be explained by changes in customers behaviour such as the urbanization that promotes the “to-go” consumption.

The market is projected to follow a compound annual growth rate (**CAGR**) at **8,5% until 2030**. This section will estimate Monster energy's revenue for a period running between 2024 and 2026 based on its 2023 results and a **linear application of the CAGR**.

The straightforward methodology used for the revenue is the following :

- Monster's revenue in 2023 are equals to \$7,140,027. This is the foundation of our thinking.
- The CAGR for the market should be around 8,5% until 2030. By assumption we think that Monster's revenue should follow this trend.
- Growth will be seen as an **incremental process** with the CAGR providing a consistent **annual multiplier**.

Using this method we'll be able to determine Monster's revenue, gross profit and net income from 2024 to 2026.



Benchmark analysis

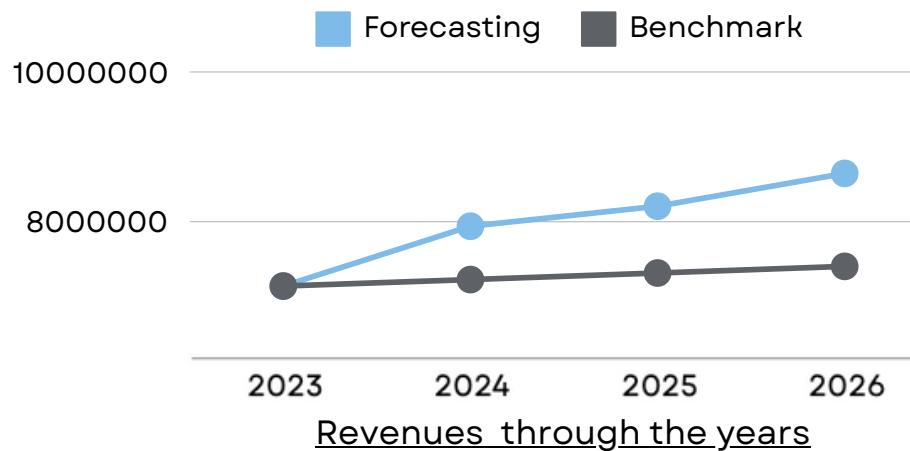
The annual growth rate (**AGR**) should be equals to **1,214% per year**. By applying the AGR to the 2023 datas we obtains the following results :

| | 2023 | 2024 | 2025 | 2026 |
|---------------------|-----------|--------------|--------------|--------------|
| <i>Revenue</i> | 7 140 027 | 7 226 576 | 7 314 184 | 7 402 863 |
| <i>Gross profit</i> | 3 794 206 | 3 840 278,5 | 3 886 910,45 | 3 934 108,65 |
| <i>Net income</i> | 1 630 988 | 1 650 792,85 | 1 670 838,2 | 1 691 126,95 |

Using this method we assume that the market will remain stable and that Monster will maintain its current market share. This assumption can be take confidently given that Monster is an key-actor in the energy drink market, it is fully established and has the loyalty of its customers.

We can observe quite a difference between our results from the forecasting and the benchmark.

Specifically we will look at the revenues.

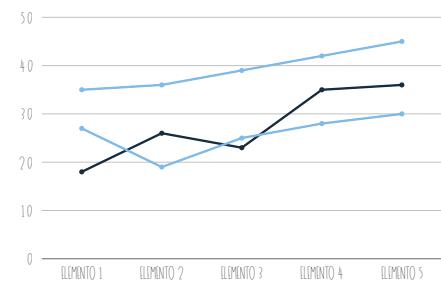


This could be explained by the fact that in the year 2023, the Monster company has made some acquisition of companies. In July 2023, Monster Beverage completed the acquisition of Bang Energy, purchasing its assets, including a production facility in Phoenix, Arizona, for approximately \$362 million. This move expands Monster's portfolio and production capacity, potentially boosting its revenue trajectory.

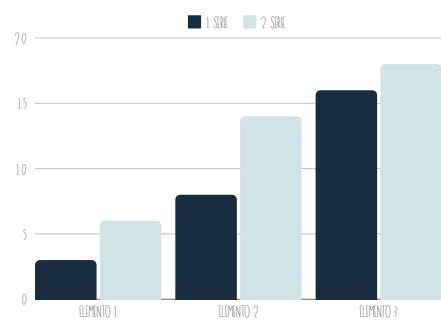


The Index

FORECASTING



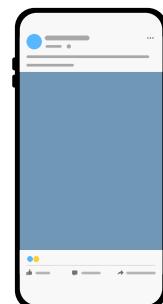
DEFINE KPIs



CREATE DASHBOARDS



BUILD A MOCK-UP



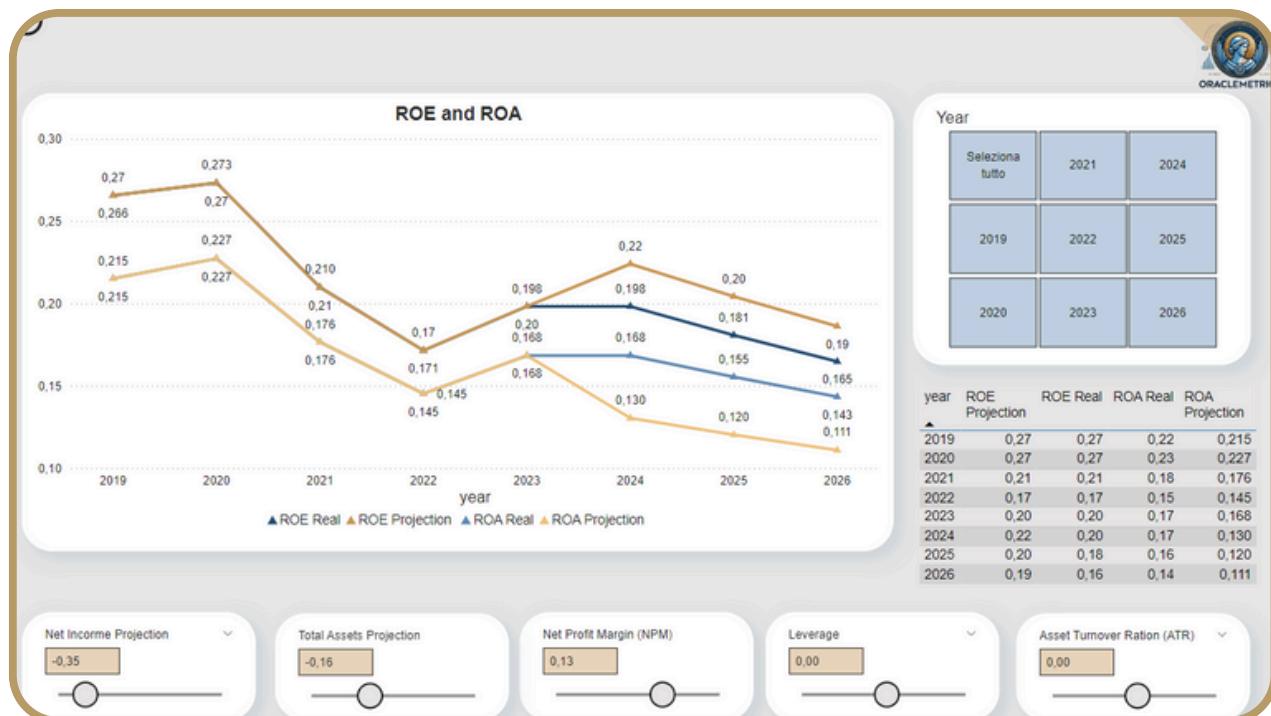


Dashboard

The Power BI dashboard developed is designed for real-time performance monitoring, providing instant access to critical data and enabling managers to make informed decisions that drive efficiency and competitiveness.

Built using DAX and other advanced Power BI features, the dashboard transforms raw data into actionable insights, ensuring decision-makers have precise and relevant information at their fingertips. It emphasizes key performance indicators (KPIs) such as sales trends, inventory levels, and customer behavior, all presented through interactive visualizations. Dynamic filtering tools allow users to analyze data by time periods, product categories, or regions, enabling accurate forecasting and strategic planning.

Power BI's capabilities extend to real-time data processing, AI-driven functionalities via Microsoft Fabric, and the integration of custom Python code for advanced analytics. Its user-friendly interface allows for quick updates and additions to the dashboard, ensuring the platform remains responsive to the evolving needs of a dynamic organization like Monster Energy Drinks.





Dashboard

One of its standout features is **real-time data streaming**, which ensures managers have the most current information to respond quickly to market changes and customer demands. This ensures that Monster Energy can stay ahead in an ever-changing retail landscape. Additionally, its **customizable design** adapts effortlessly to Monster Energy's evolving business needs, allowing teams to tailor insights to specific objectives, while **dynamic and interactive charts** provide a clear, actionable view of trends and performance metrics.

The dashboard excels in **data integration**, seamlessly connecting to point-of-sale systems, inventory platforms, customer analytics tools, and various other data sources, offering a comprehensive and unified view of operations. Its **multi-platform accessibility** across web, mobile, and tablets ensures flexibility, enabling managers and teams to stay connected and informed, whether in the office or on the go. By integrating **diverse data formats**, from structured datasets to real-time feeds, and leveraging advanced DAX functions, the dashboard ensures powerful analysis and adaptability to the organization's needs.

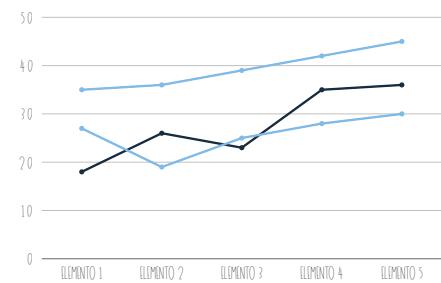
With its **multi-page structure**, the dashboard supports a granular exploration of performance dimensions, enabling users to drill down into specific areas, analyze trends, identify recurring patterns, and uncover actionable insights. Furthermore, the **ease of data manipulation** in Power BI ensures that updates, modifications, and new feature additions can be implemented swiftly when data is available, guaranteeing **near-instant responsiveness** to the ever-changing demands.

In conclusion, the Power BI dashboard is a transformative solution for Monster Energy, combining real-time monitoring, seamless integration, advanced analytics, and a highly user-friendly interface to empower data-driven decision-making, foster sustainable growth, and elevate operational excellence to new heights.

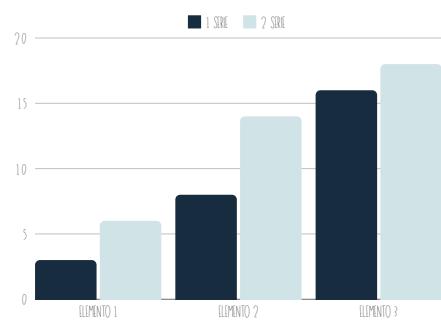


The Index

FORECASTING



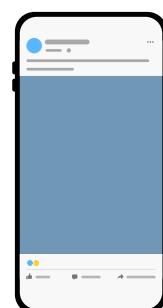
DEFINE KPIs



CREATE DASHBOARDS

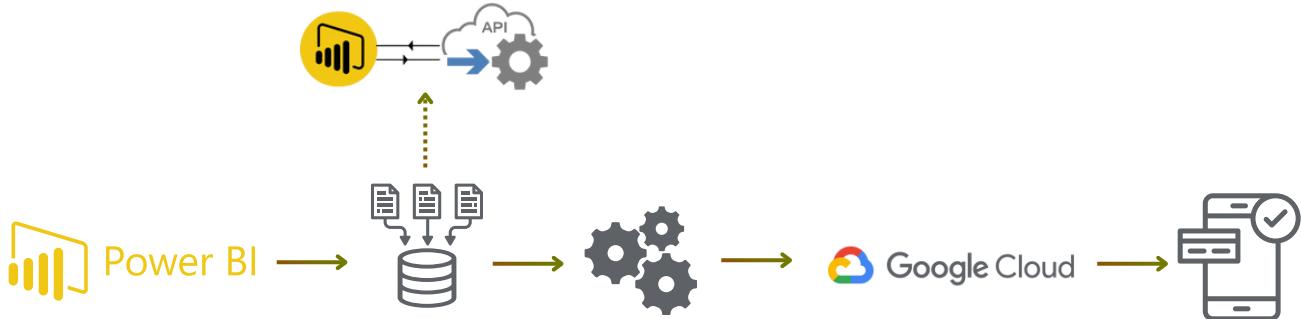


BUILD A MOCK-UP





Software architecture



The **software architecture** for integrating a Power BI Dashboard with a mobile application is designed around a **Microservices-based approach** to ensure seamless data flow and real-time performance monitoring.

Microservices allow a large application to be separated into smaller independent parts, with each part having its own realm of responsibility. In the presented software architecture we have five main components.

The **Power BI Dashboard** serves as the central hub, aggregating data from multiple sources like point-of-sale systems, inventory management, and customer analytics, as well as from Continuous Learning algorithms. From this sources we are able to generate key performance indicators (KPIs) such as sales trends and inventory levels.

This processed data is delivered to the mobile application via a data processing layer that leverages the **Power BI REST API** to format and stream real-time updates.



Software architecture

Middleware solutions, such as Microsoft Power Automate or Zapier, manage data flow and transformation, ensuring smooth communication between the Power BI backend and the mobile app while handling fault tolerance with message queues.

The system leverages **Google Cloud's robust infrastructure** to store and manage processed data, ensuring seamless delivery to the mobile app. Utilizing Google Cloud's **scalable storage solutions** and advanced **data processing** services guarantees real-time access to accurate information, enhancing the app's performance and reliability.

This cloud-based framework supports **data integrity** and **availability**, facilitating smooth interactions between the backend and mobile interface while efficiently handling high-volume data processing demands.

The mobile app then consumes this real-time data, enabling managers to monitor performance metrics, receive push notifications for critical changes, and make informed decisions directly from their mobile devices, ensuring operational agility and responsiveness in the competitive retail environment, offering also a comprehensive tool for enhancing operational decision-making in the large-scale retail (GDO) sector for Monster Energy.

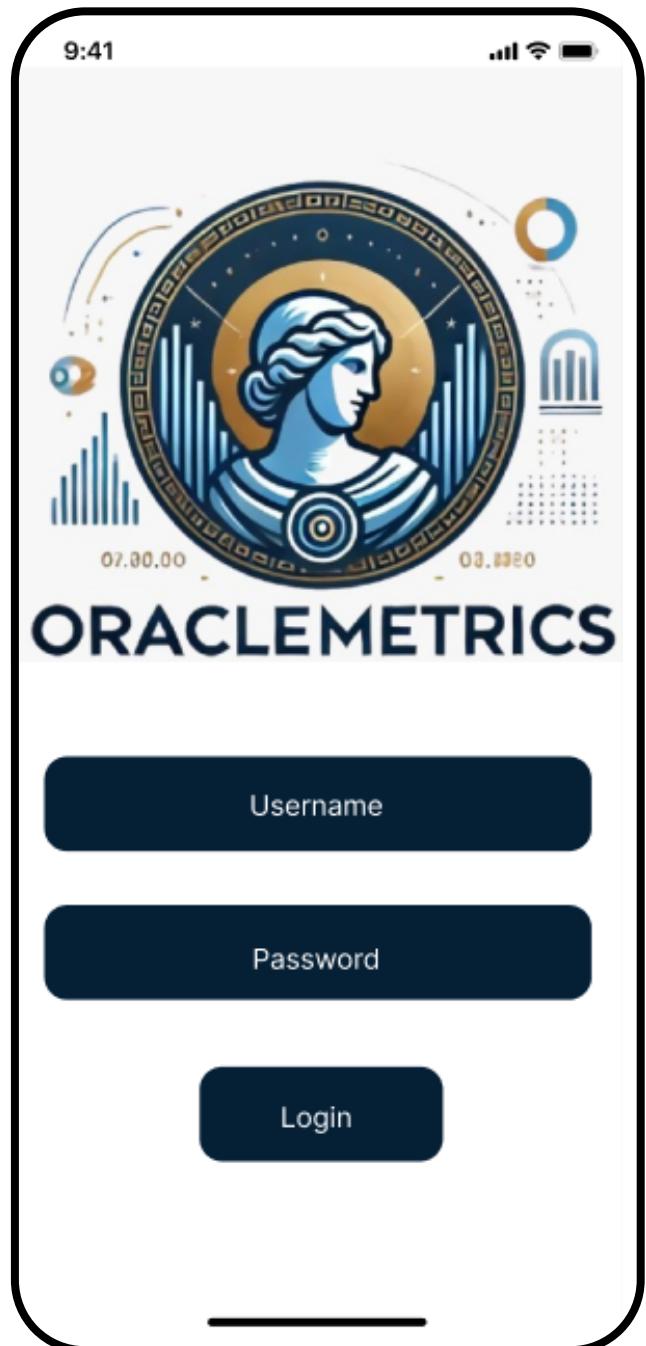


The Mobile App

We designed a mobile app tailored for managers and decision-makers in the large-scale retail (GDO) sector, focusing on enhancing operational efficiency and responsiveness.

The app integrates seamlessly with the Power BI Dashboard, offering a sleek and **intuitive interface** to deliver real-time insights into key performance indicators (KPIs) such as sales trends, inventory levels, and customer preferences. By aggregating data from various sources like point-of-sale systems, inventory management platforms, and customer analytics, the app ensures that users always have access to up-to-date information.

The **login screen** is the first interaction the user will have with the app. Designed to be simple and intuitive, this screen allows users to quickly access the system with their credentials. It includes quick access via company accounts, ensuring secure and fast login. Once logged in, users are automatically directed to the Dashboard screen, where they can view all critical, **real-time performance information**.

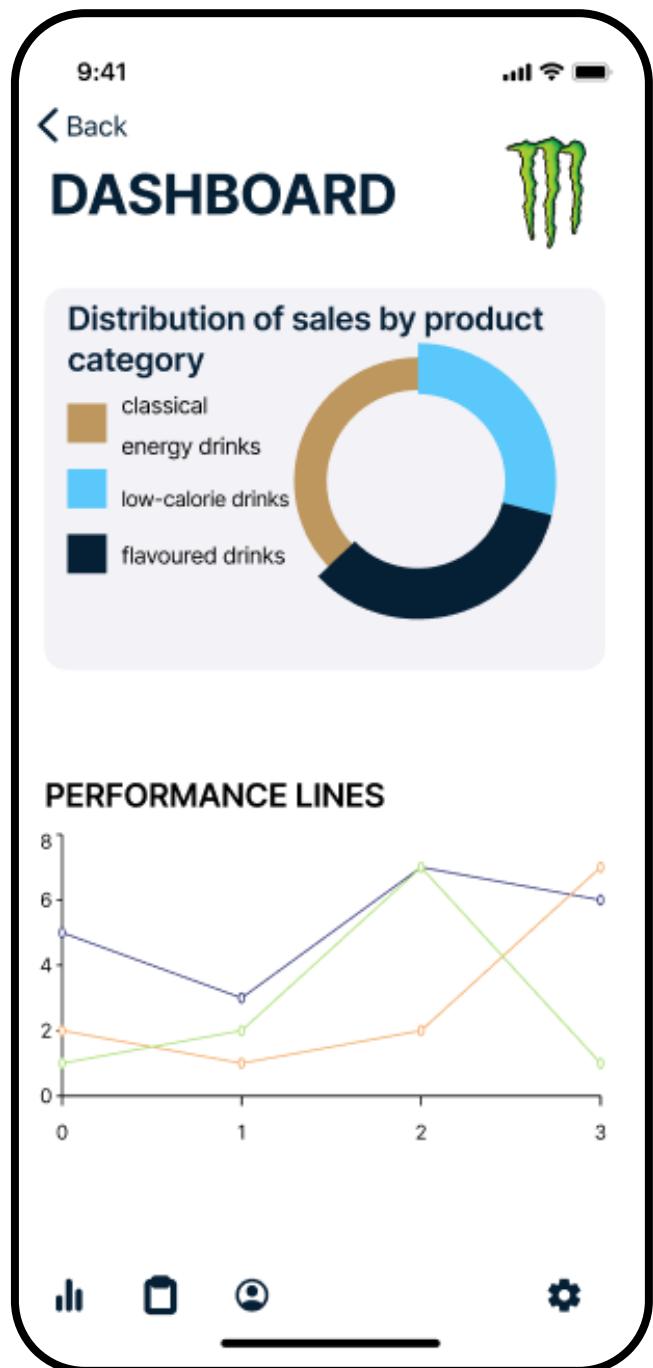




The Mobile App

The **dashboard screen** provides a comprehensive overview of key metrics in real-time. As we introduced before, here users can view essential indicators such as sales, inventory levels, and customer behavior. The clean and **interactive design** enables them to easily navigate through different data points and drill down into further details. Users can also interact with visualizations like graphs and tables for a deeper understanding of business performance. The dashboard is customizable, allowing users to filter data based on specific periods, regions, or product categories.

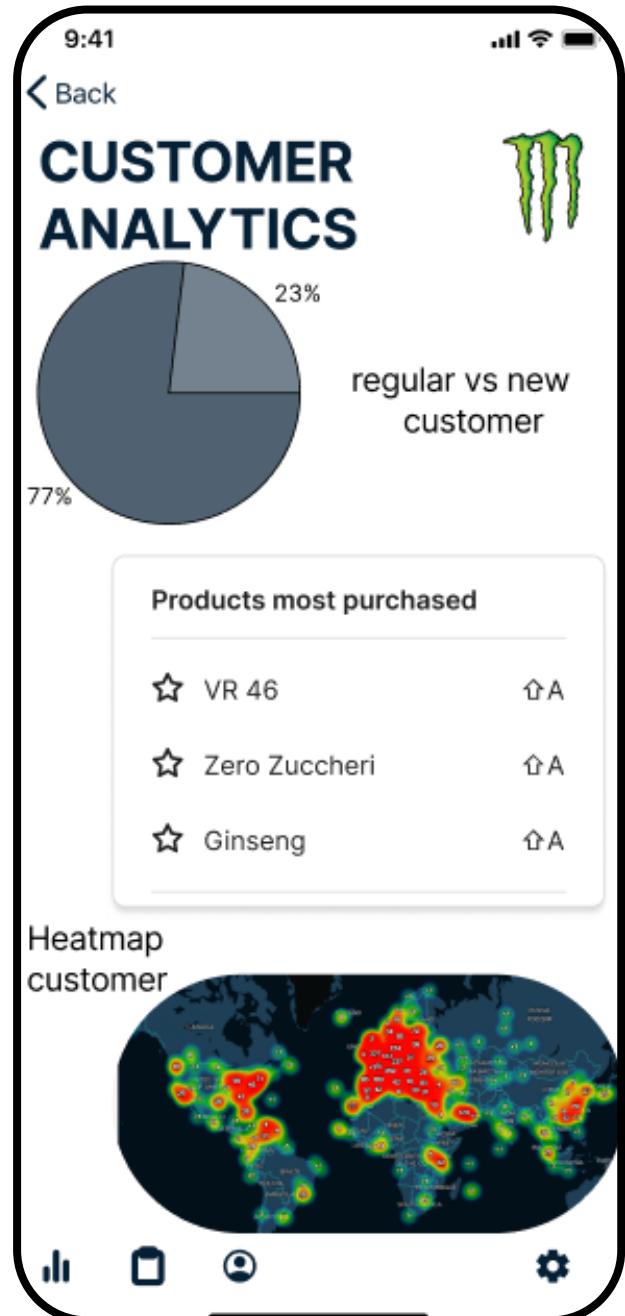
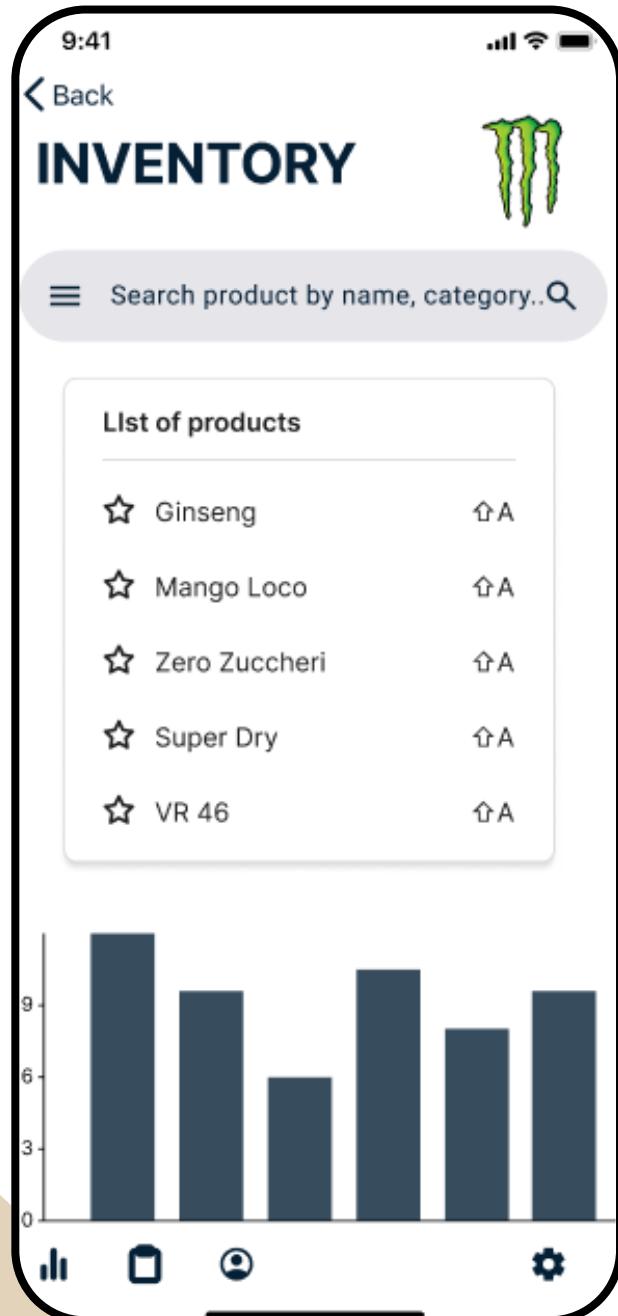
The **inventory screen** is dedicated to monitoring and managing stock levels in real-time. Users can view the quantity of available products in stock, with visual cues for products with low or depleting stock. This screen enables users to manage inventory more effectively, making quick decisions to restock high-demand products or reduce excess inventory.





The Mobile App

The customer analytics screen is designed to offer in-depth insights into customer behavior and preferences. Using historical and real-time data, the app provides detailed information on customer purchasing behavior, such as best-selling products, seasonal trends, and purchase frequency. Interactive visualizations, such as bar charts and heatmaps, help users identify **buying patterns** and make **strategic decisions** to enhance the **customer experience**.





Competences

- **Alissia Biliotti** - Editorial input.
- **Chiara Capodagli** - **Technical Writer & Software Architect:** Introduction to the project, with OracleMetrics description, abstract and Monster introduction; Software architecture.
- **Giuseppe Di Stefano** - **Mobile Application Developer & Graphic Designer:** Building the OracleMetrics Mobile App; graphic design logo.
- **Zoé Martinez** - **Market Analyst:** Benchmark analysis.
- **Erica Neri** - **Team Leader, Data Analyst & Sustainability Specialist:** KPI construction and analysis; sustainability growth analysis.
- **Gina Santoro** - **Forecasting Analyst:** Forecasting analysis with CAGR and Sustainability growth index.
- **Francesco Secoli** - **Business Intelligence Developer:** Construction of the interactive dashboard on PowerBi, with functions implementation and graphic design.

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