

Quantifying and Analyzing Operational Volatility

Team Members:

Abhishek Kumar Singh
Karishma Darla
Sanjay Sandhosh

Advisors:

Sponsor: Mr. Joseph Collins
Faculty: Prof. Luvai Motiwalla
Mentor: Prof. Tao (Tony) Gao



- **Company Overview:** Dell Technologies is a global technology leader offering innovative products and services, including PCs, servers, data storage, and IT infrastructure.
- **Founding:** Established by Michael Dell in 1984.
- **Global Reach:** Operates in over 180 countries.
- **Core Strengths:** Focuses on customer-centric solutions, sustainability, and technological innovation.
- **Reputation:** Trusted partner for digital transformation by businesses and individuals globally.



DELL EMC COMMON CUSTOMER EXPERIENCE



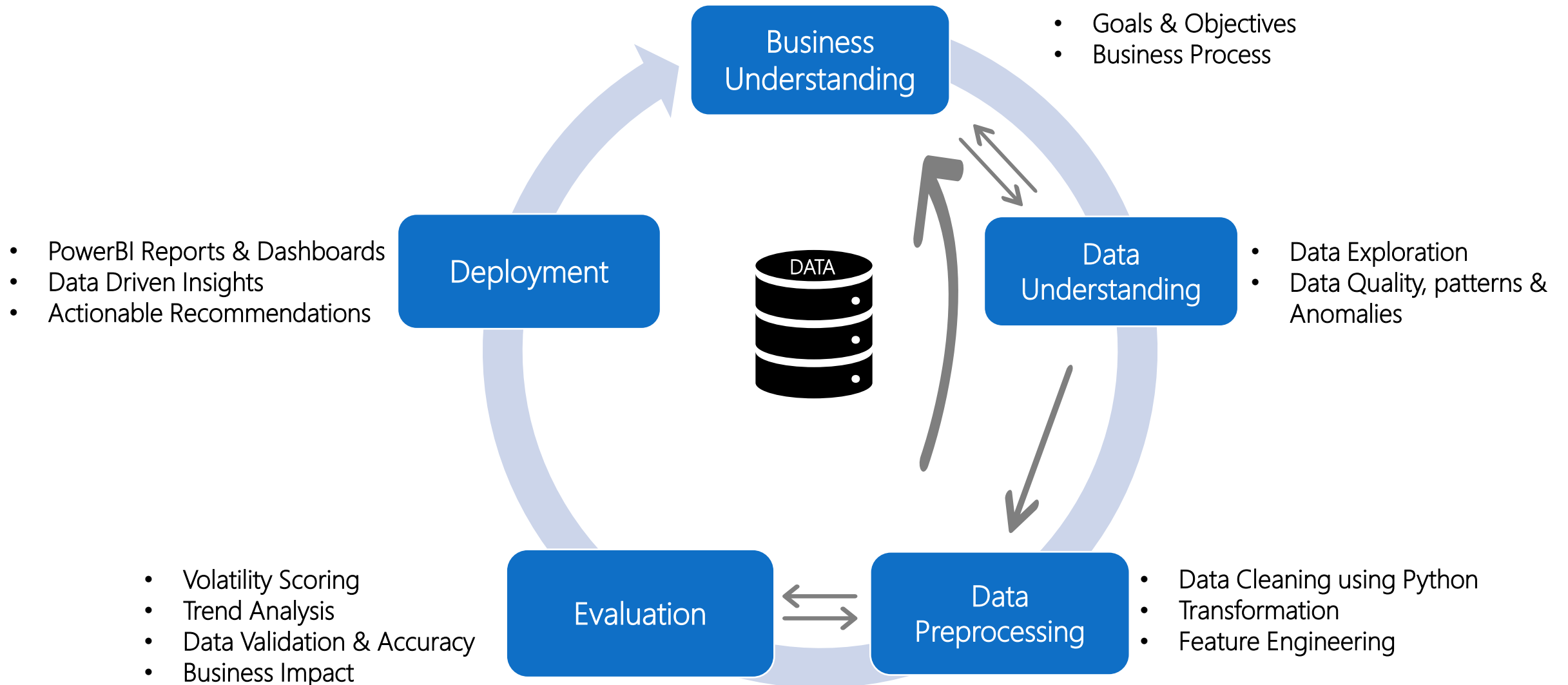
PROJECT OVERVIEW & GOALS

- Develop a methodology to **quantify deal volatility** by identifying key metrics.
- **Provide actionable insights** into deals stability through the Volatility Score, helping stakeholders identify high-risk deals because volatility or unpredictability can be expensive.
- **Establish KPIs** to track the effectiveness of volatility management and provide actionable insights for continuous improvement.

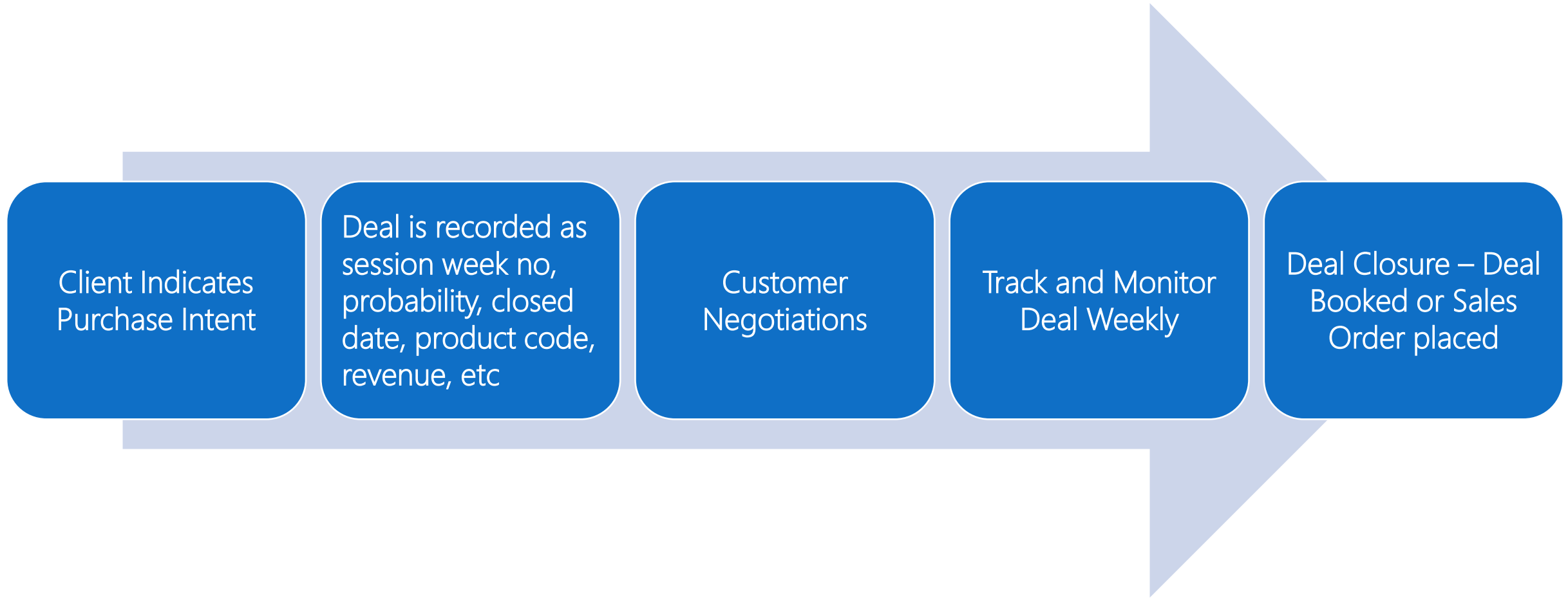


METHODOLOGY

Cross Industry Standard Process for Data Mining (CRISP-DM)



BUSINESS PROCESS



DATA PREPROCESSING

DATA COLLECTION

Received 3 quarters worth of data, one file for each quarter and a file for booked deals

DATA INTEGRATION

Merge/Appended quarterly data based on Deal ID's.
Resolve Schema Differences, Standardize column names, data types, and formats.

DATA REDUCTION

Feature Selection: Identified and retained only the most relevant features. Reduction using techniques like aggregations to reduce the number of features while retaining essential information.

DATA CLEANING

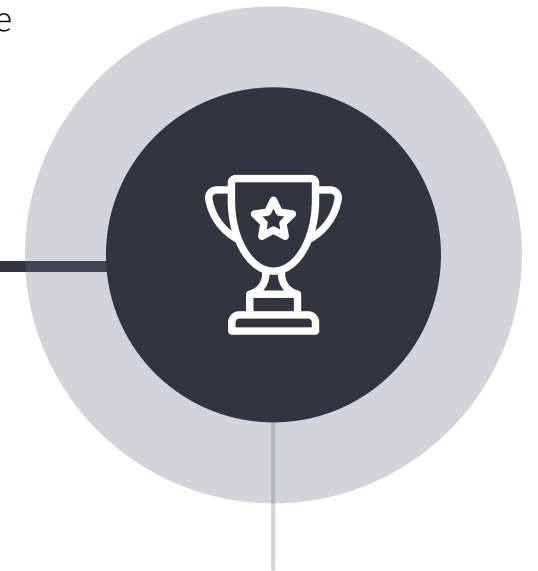
Handled Missing Data, Imputed missing values using back-fill method, Identified and eliminated duplicate records. Corrected Inaccuracies by standardizing formats.

DATA TRANSFORMATION

Normalization and Standardization based on z score.
Feature Engineering: Created new features and modified existing ones to capture important patterns by calculating time to close, closed date week no., session week no.

DATA VALIDATION

Verified data consistency, accuracy, and completeness. Checked for outliers or anomalies that may affect analysis.



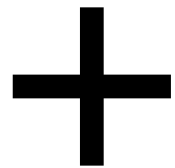
VOLATILITY SCORE

The degree of variation or fluctuation in a value over time. In the context of business, it measures how much metrics like revenue, deal closure time, or customer demand change. High volatility means frequent or large changes, while low volatility indicates more stability and consistency.

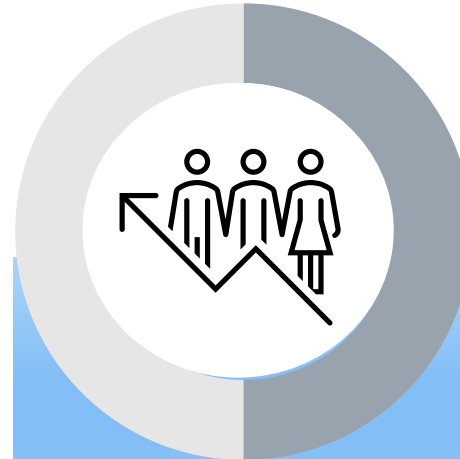
RUNNING VOLATILITY



Measures the rolling standard deviation of scaled closed date changes and revenue changes over a 4-week window, capturing the fluctuation for each deal.



WEIGHTED VOLATILITY



Combines adjusted z-scores of scaled closed date changes and revenue changes using equal weights to assess immediate deal variability with respect to all the deals.



FINAL VOLATILITY



The sum of running volatility and weighted volatility, providing a comprehensive measure of overall deal volatility.

DESCRIPTIVE ANALYTICS



0.8016

Average Volatility Score for Booked Deals.



Time to close

0-3

3-7

7-11

11-15

Volatility Score

0.9850

0.7544

0.5312

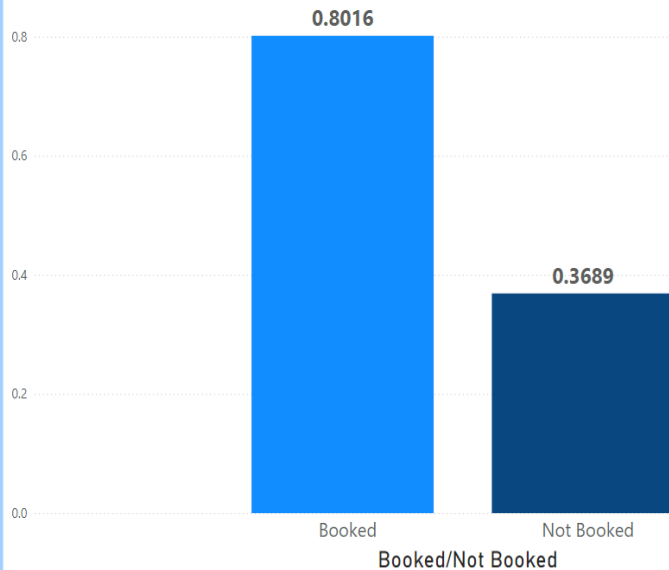
0.3035



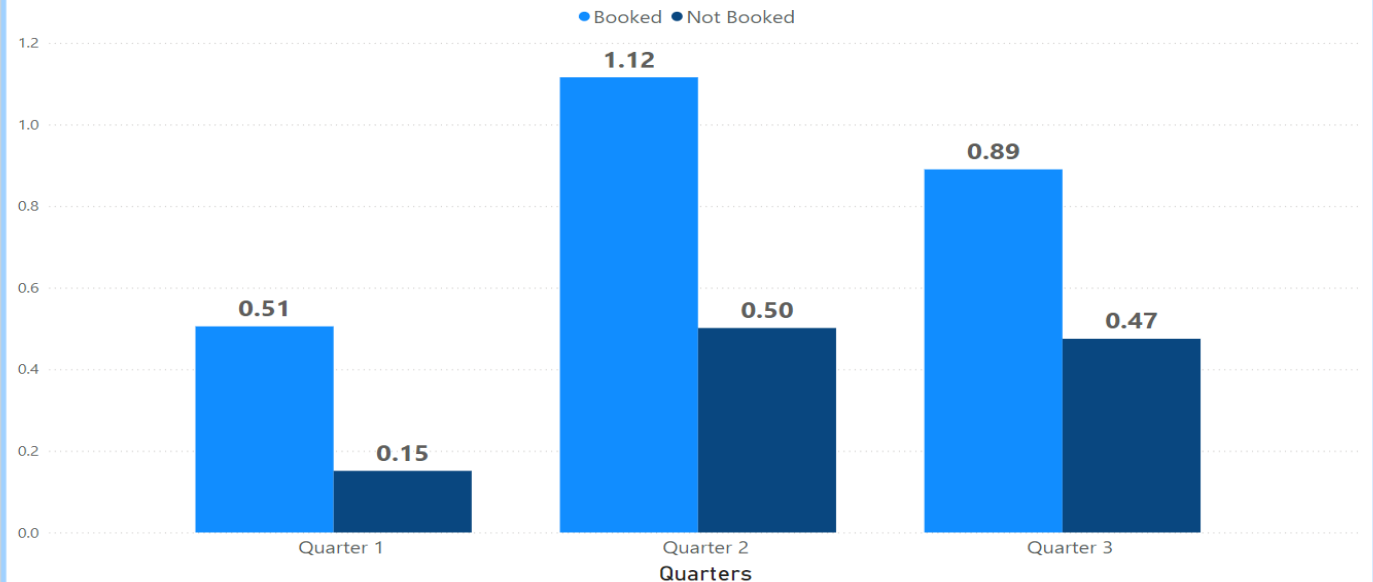
0.3205

Average Volatility for the Most In-Demand Product (3).

Average Volatility for Booked and Not Booked Deals

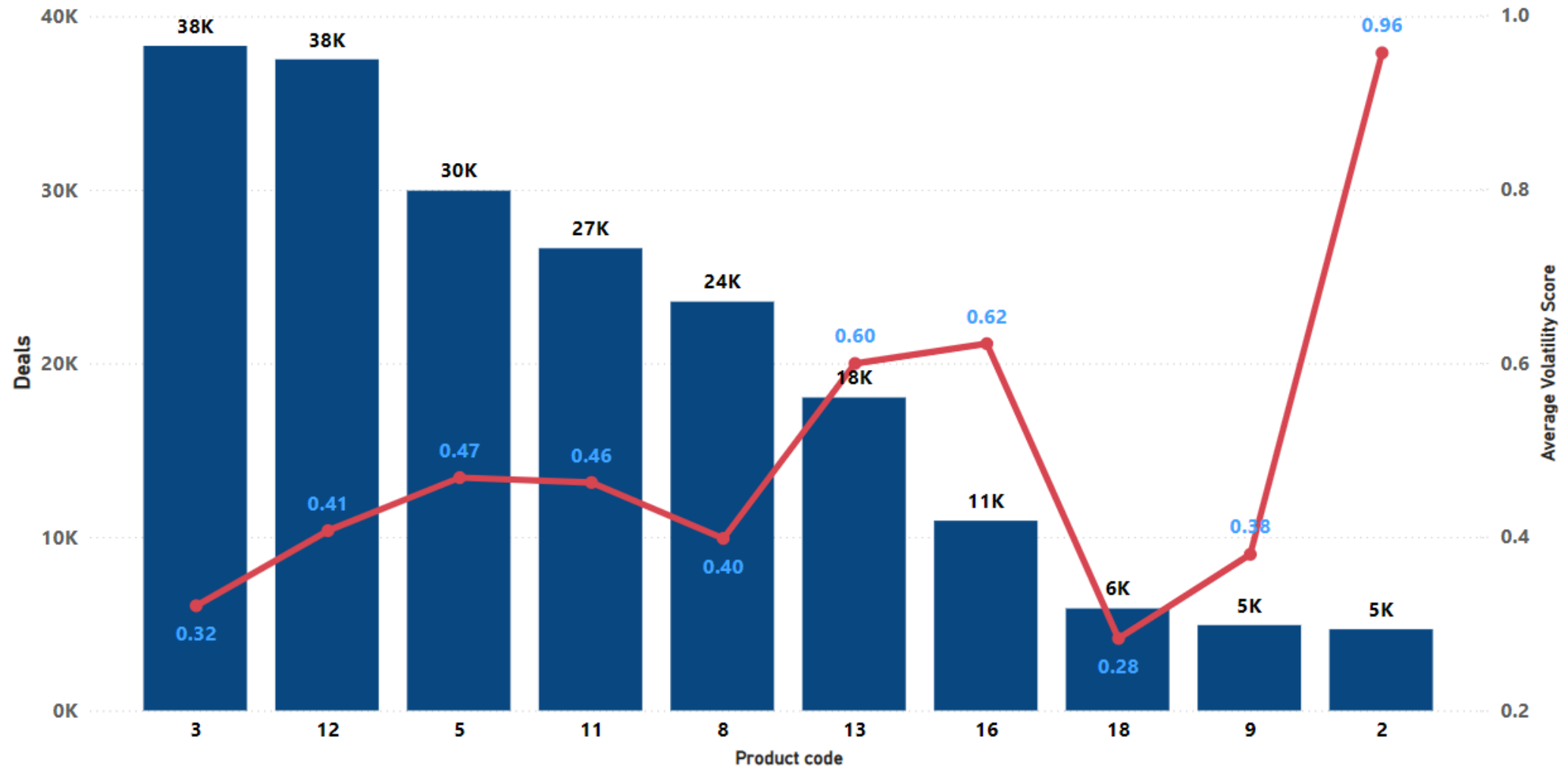


Quarterly Volatility



Top 10 Products' Volatility

● Count of Deal_id ● Average of Average_final_score



DATA DRIVEN INSIGHTS



67%
VOLATILITY

Booked deals exhibited 67% higher volatility compared to not booked deals.



89.90%
NOT BOOKED DEALS

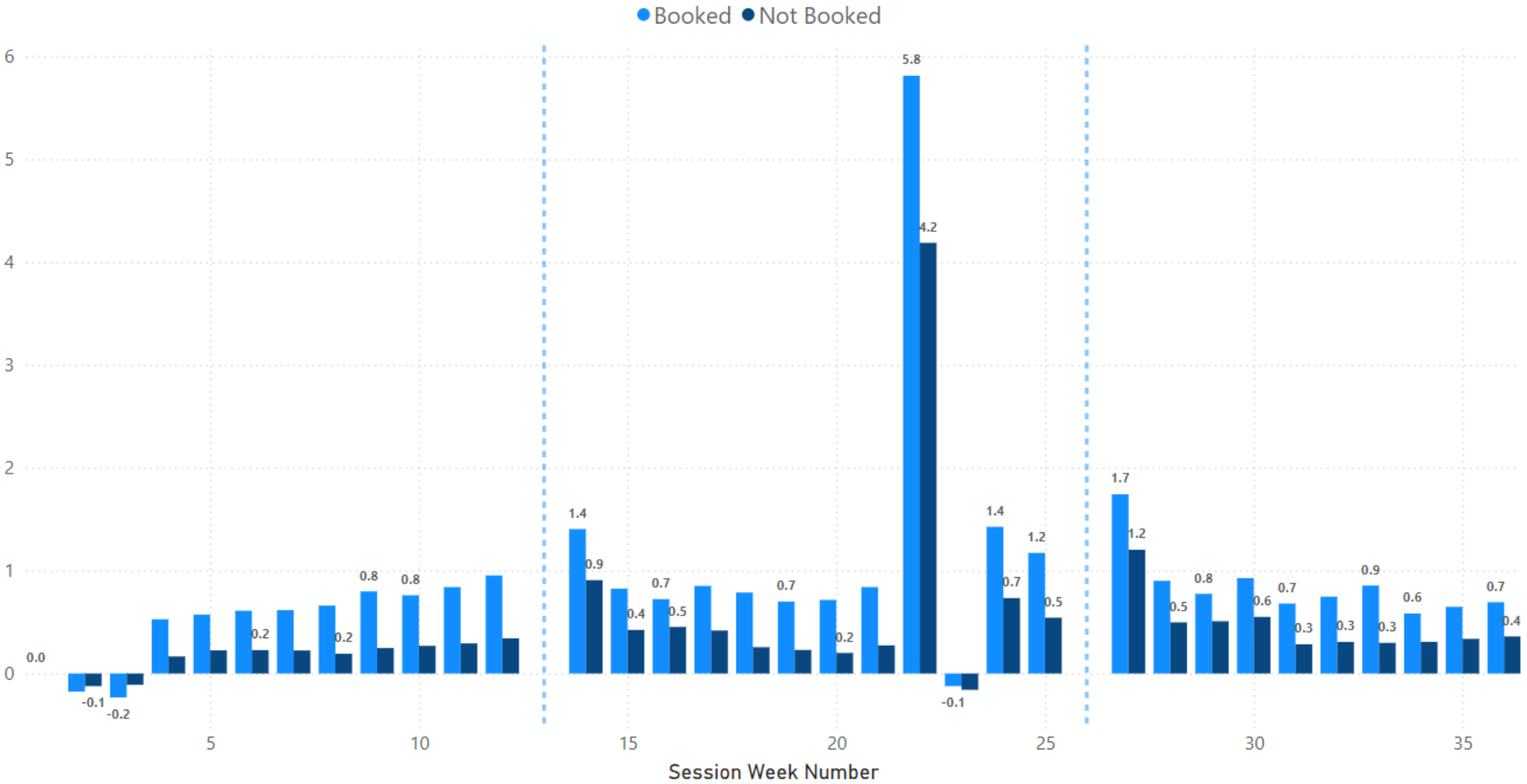
89.9% of the deals were not booked over the last three quarters.



0.96
PRODUCT VOLATILITY

In the last 3 quarters, Product 2 showed greater volatility than the other top 10 products.

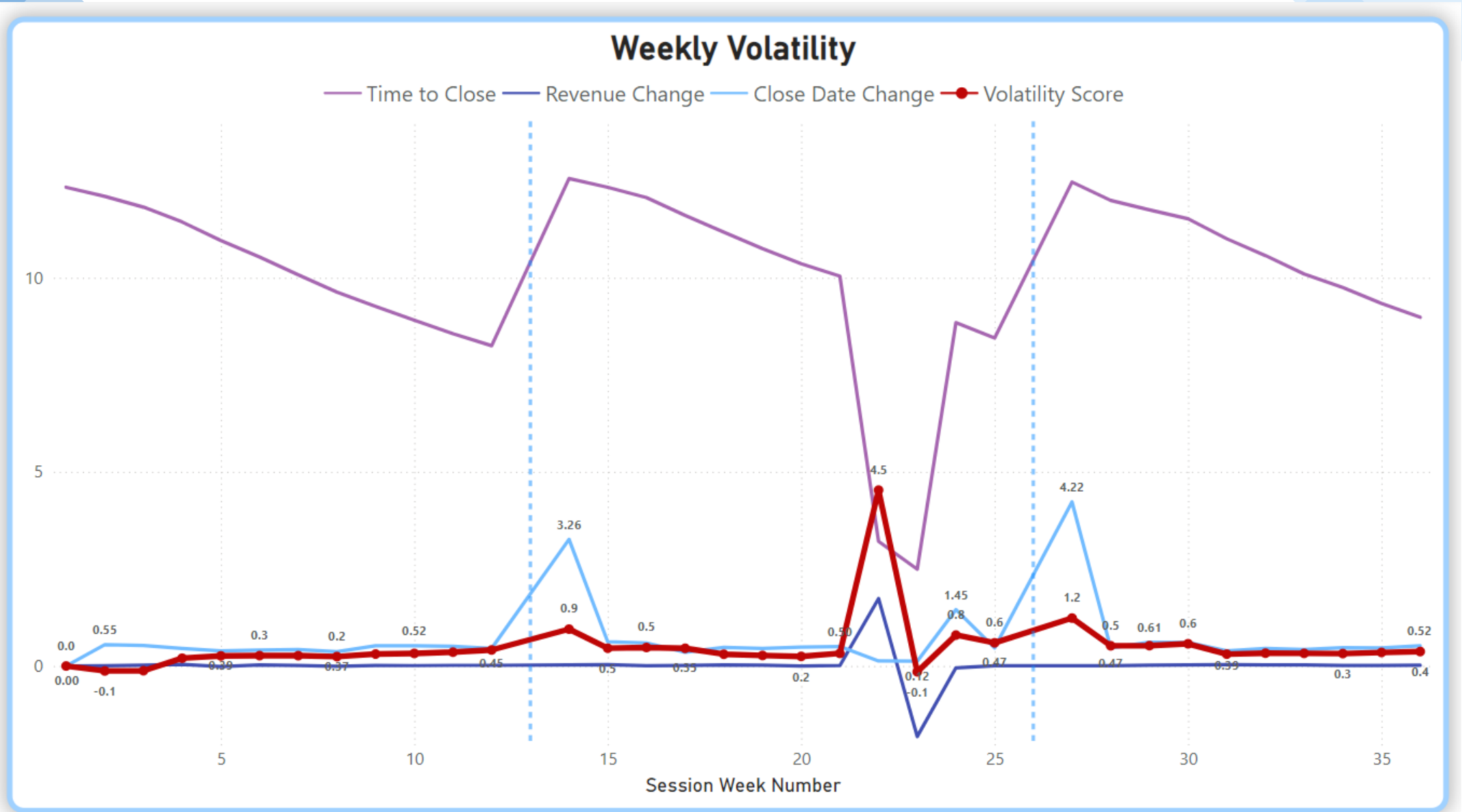
Weekly Volatility for Booked and Not Booked Deals



DATA DRIVEN

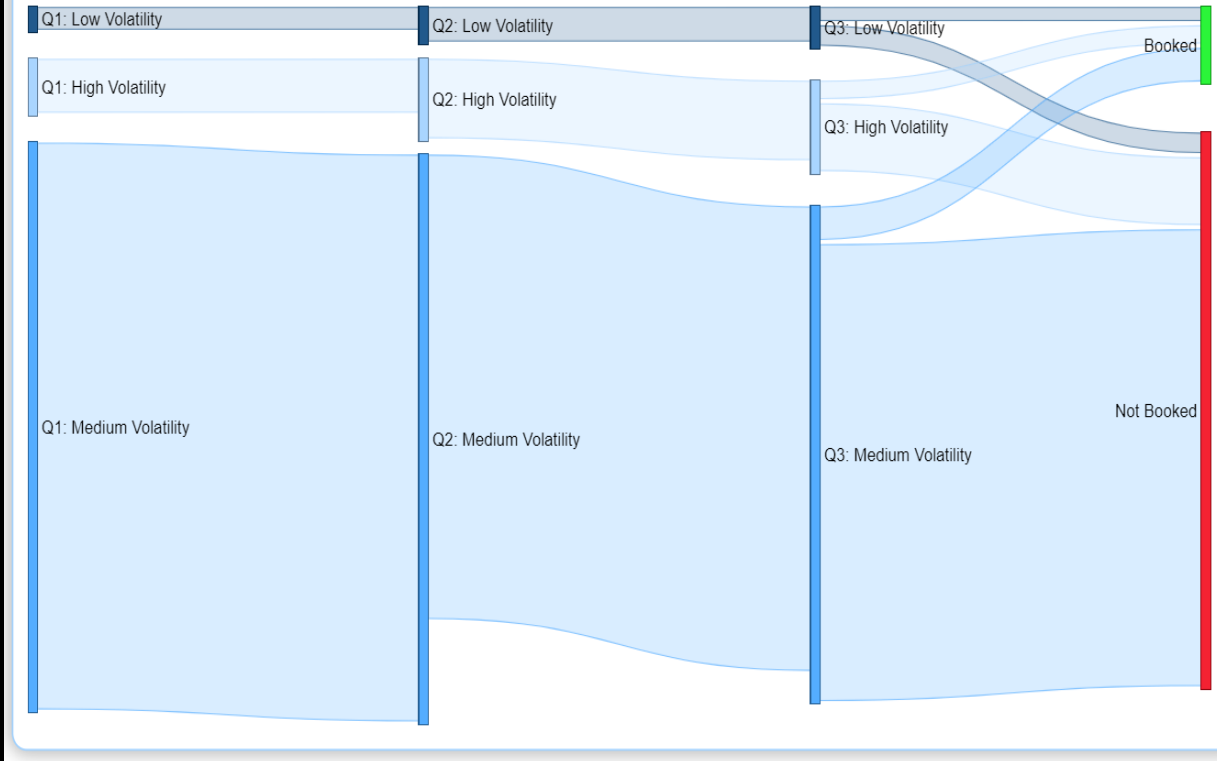
- Significant peaks occur at the end of quarters, showing the highest fluctuation.
- Closed Date Change in correlation to Time to close are the primary contributor to volatility.
- Time to Close and Revenue Changes remain relatively stable, indicating that volatility is largely driven by deal closure dates.
- Around Week 22, a significant change in Time to Close led to an increase in revenue volatility.
- Volatility decreases after the peaks, suggesting the fluctuations may be seasonal or periodic.







Distribution of Volatility for Booked and Not Booked Deals



Low

2.42%

Medium

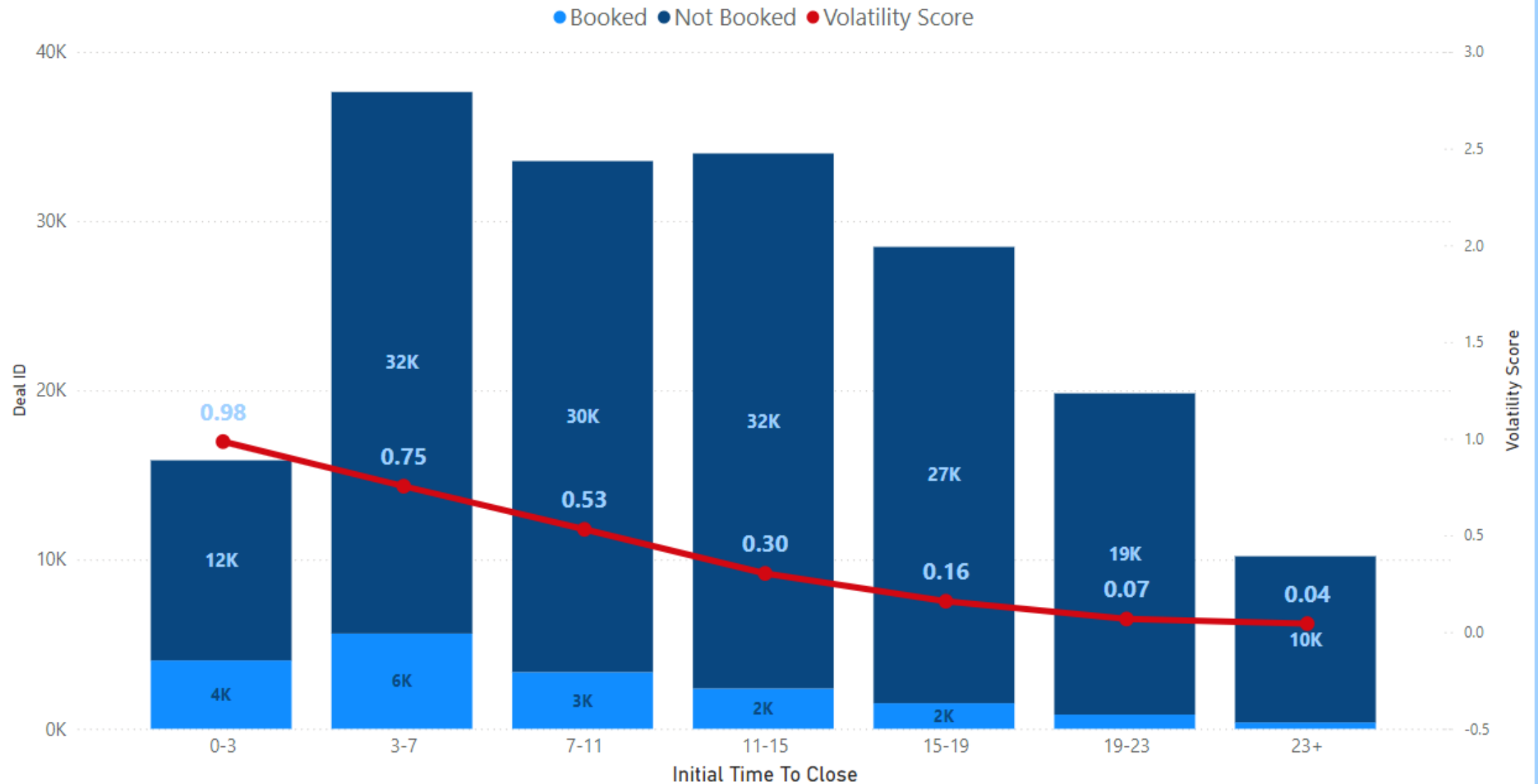
87.58%

High

10.01%

- There are 2.42% low volatile deals, 87.58% Medium Volatile Deals and 10.01% Highly Volatile deals
- Out of 10.01% High Volatile Deals 12.61% were Booked
- Volatility decreases as the initial time to close increases, with the highest volatility (0.9850) in 0-3 weeks and the lowest (0.0350) in 23-27 weeks.
- Most deals (3-15 weeks) have moderate volatility, with the peak volume in the 3-7-week range.

Initial Time to Close For Booked and Not Booked Deals



PRESCRIPTIVE ANALYTICS



OPTIMIZE PRODUCT VOLATILITY

- Leverage historical trends and volatility to predict demand
- **Increase Stock Flexibility:** Implement agile restocking during peak demand.
- **Dynamic Pricing:** Adjust prices based on demand and volatility to maximize profitability.



OPTIMIZE VOLATILITY ASSOCIATED WITH DEAL VISIBILITY

- **Optimize Deal Timelines:** Streamline processes to enhance efficiency, focusing on managing low(<3 weeks initial time to close) and high(>27 weeks initial time to close) deals which are prone to be more volatile.
- **Tiered Deal Management:** Categorize deals by time to close and apply tailored strategies.



ANALYZE VOLATILITY WITHIN BOOKED AND NOT BOOKED

- Volatility score for not booked deals are 0.3689 and booked deals are 0.8019
- **Identify Contributing Factors:** Analyze the key drivers of volatility in booked deals, such as late-stage changes, customer demands, or pricing fluctuations.
- **Streamline Booking Process:** Standardize and expedite the booking process to minimize delays and reduce volatility in deal closures.

RECOMMENDATIONS

Implement real-time dashboard and predictive models

Forecast volatility trends and detect early signs of instability. Focus on optimizing inventory turnover based on volatility patterns to prevent overstocking or stockouts.

Automate workflows and Service Level Agreements (SLA)

Leveraging historical volatility data to align staffing and resources with peak periods of deal activity and close times, reducing delays and inefficiencies.

Standardize deal closure and customer communication

Use volatility insights and customer-centric tools like Salesforce Forecasting to accurately predict delivery times and reduce delays.

Strengthen Supplier Partnership

Establish volatility-driven contracts that adapt to demand fluctuations, fostering seamless collaboration and stronger partnerships.

— LIMITATIONS

1. **Lack of Industry-Specific Adjustments:** Model fails to account critical industry-specific factors like regions or seasons, limiting its practical utility in specialized domains.
2. **Simplistic Assumptions in Weighting and Scoring:** Equal weights are used for key components like Weighted Volatility and Historical Volatility to calculate the Final Volatility Score. This assumes equal importance of short-term and long-term fluctuations without empirical validation.
3. **No Consideration of External Factors:** Does not incorporate external factors like market trends, customer behavior, supplier behavior, or macroeconomic conditions.
4. **Static Analysis Approach:** This project relies on current fiscal year volatility metrics but does not use predictive modeling techniques to forecast future deal outcomes or changes in volatility.



THANK YOU

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