

Dowdle Capstone Project Report

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Abstract. The abstract should briefly summarize the contents of the paper in 150–250 words. The abstract should briefly summarize the contents of the paper in 150–250 words. The abstract should briefly summarize the contents of the paper in 150–250 words. The abstract should briefly summarize the contents of the paper in 150–250 words.

Keywords: mobile computing · mobile usability · multimedia · cloud computing

1 Introduction - link GitHub and Overleaf report

This project explores procurement performance using real-world data; the goal is to predict whether a purchase order will result in supplier compliance. Order compliance is critical in performance metrics. It reflects whether supplier contracts are meeting agreed-upon delivery schedules, product quality, and pricing terms. By building a predictive model based on features such as quantity, price deviation, or defect rates, the objective is to provide procurement teams with data-driven insights. This could predict risk, improve supplier relationships, and enhance operational efficiency.

1.1 Goal of This Project

The final deliverables from this project will include:

- Machine learning model predicting order compliance (including data visualizations [5])
- A PDF report written in LaTeX via Overleaf
- A fully documented GitHub repository with Jupyter notebooks (including EDA [5])

1.2 Project Resources

- **GitHub Repository:** <https://github.com/Bdowdle4/DowdleAnalyticsCapstone>
- **Overleaf Report:** <https://www.overleaf.com/read/bszyhdxsnrsf>
- **Pro Analytics 01:** <https://github.com/denisecase/pro-analytics-01>
The guide used to follow a repeatable workflow for professional python projects [1]

2 Collect and Describe Data

The data used contains key procurement metrics that reflect supplier performance, order accuracy, and pricing effectiveness. Each row represents a purchase order or PO. Some attributes include dates, item category, quantity, price, defects, and whether the supplier was compliant or not.

2.1 Domain and Professional Description

Domain: Business Operations Subdomain: Procurement / Supply Chain

This project would be important to:

1. Supply Chain Analysts
2. Procurement Managers
3. Chief Purchasing Officer (CPO)

Procurement professionals use analytics to track KPIs such as on-time deliveries, cost savings, and defect rates to measure supplier performance. When a supplier consistently does not meet the expected performance level, they are a financial and operational risk. Suppliers can be considered non-compliant for late deliveries, defective products, and violations of negotiated pricing. By identifying patterns in procurement data and predicting compliance outcomes, organizations can optimize sourcing strategies, negotiate better contracts, and minimize risk exposure. [4]

2.2 Dataset Resource

Procurement KPI Analysis Dataset: [2]

<https://www.kaggle.com/datasets/shahriarkabir/procurement-kpi-analysis-dataset>

Format: CSV file with an average of 10 key features per PO

Column Summary:

- **po_id**: Unique purchase order ID
- **supplier**: Supplier name
- **order_date**, **delivery_date**: Date fields for lead time calculation
- **item_category**: Categorical variable
- **order_status**: Text field, could include status like "delivered", "pending"
- **quantity**, **unit_price**, **negotiated_price**: Numerical order and cost metrics
- **defective_units**: Integer count of defected items
- **compliance**: Target variable for prediction (binary or categorical)

2.3 Table Examples

The gasoline prices are summarized in Table 1

Table 1. Gas Prices

Month	Price
Jan	\$2.12
Feb	0.12
Mar	1.12
Apr	2.12
May	3.12
Jun	1.12

Table 2. Table captions should be placed above the tables.

Heading level	Example	Font size and style
Title (centered)	Lecture Notes	14 point, bold
1st-level heading	1 Introduction	12 point, bold
2nd-level heading	2.1 Printing Area	10 point, bold
3rd-level heading	Run-in Heading in Bold. Text follows	10 point, bold
4th-level heading	<i>Lowest Level Heading.</i> Text follows	10 point, italic

3 Clean and Prepare Data

3.1 Data Formats

3.2 Null Handling

3.3 Outliers

3.4 Jupyter Notebook

Displayed equations are centered and set on a separate line.

$$x + y = z \tag{1}$$

Please try to avoid rasterized images for line-art diagrams and schemas. Whenever possible, use vector graphics instead (see Fig. 1).

The detailed steps of the MEC is shown in Figure 2.

4 Exploratory Data Analysis (EDA)

4.1 Trend Line Charts

4.2 Correlation Matrix

4.3 Vendor Comparisons

Proof. Proofs, examples, and remarks have the initial word in italics, while the following text appears in normal font.

The following are the items in my lunch menu.

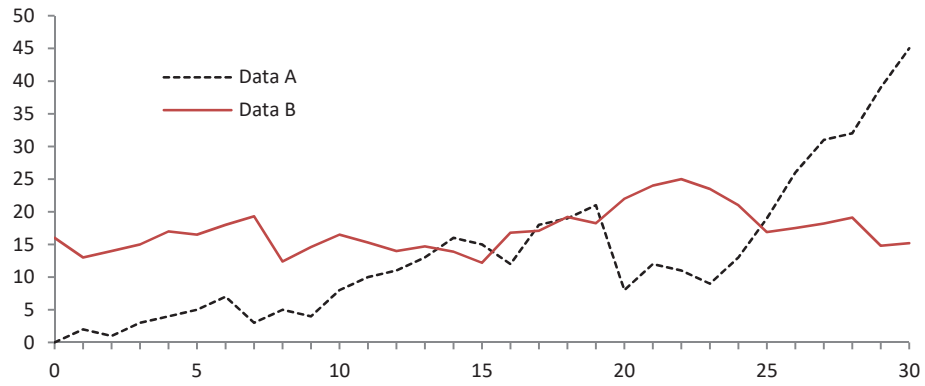


Fig. 1. A figure caption is always placed below the illustration. Please note that short captions are centered, while long ones are justified by the macro package automatically.

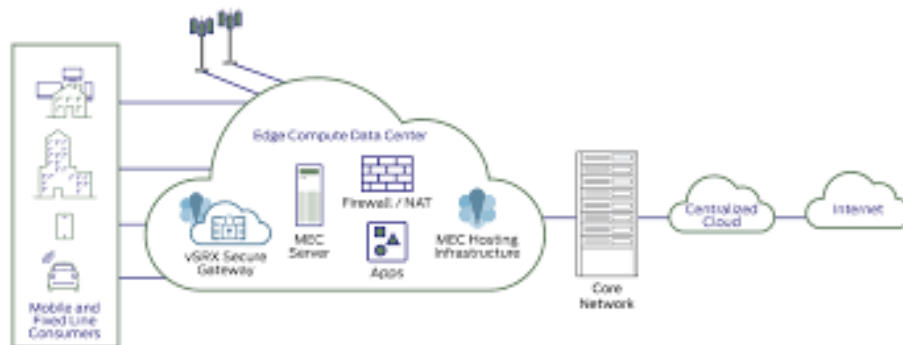


Fig. 2. This is the MEC

- Fish
 - sauce
 - fires
- Chicken
- Yogurt
- ice cream

The following are the steps to cook this recipe.

1. Clean vessels
2. Cook
 - (a) On the stove
 - (b) Place the pan
 - (c) Crack the egg
3. Eat

5 Model and Generate Insights

5.1 Chosen Models

5.2 Parameters

5.3 Metrics

6 Present Results

6.1 Summarize KPIs

6.2 Plot Model Predictions

6.3 Maybe Dashboard Style Visuals?

7 Finalize Deliverables

7.1 GitHub Repo Completeness

7.2 Overleaf Report Completeness

7.3 Limitations

7.4 Future Work

8 Giving Credit Where It's Due

For citations of references, we prefer the use of square brackets and consecutive numbers. [?], [?].

Now I am citing this article. [?]

citing now [?], [3]

Now, I am using my sixth [?] citation.

[?]

[]

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