Commodities Visualization analysis using Web Explorer

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*Abstract*—Commodity market visualization analysis is essential for tracking price fluctuations, supply demand trends, and trading volumes across various sectors, including energy, metals, and agriculture. This analysis leverages data visualization tools such as Tableau, Power BI, Python (Matplotlib, Seaborn), and D3.js to transform raw market data into interactive and insightful representations. By utilizing these tools, investors, traders, and analysts can better interpret complex datasets, identify market patterns, and make informed decisions. The integration of real-time data with visualization techniques enhances forecasting accuracy, risk assessment, and strategic planning in commodity trading. Our approach integrates statistical analysis and visualization techniques to identify key trends and anomalies. By addressing existing limitations, we propose a more dynamic and interpretable methodology to analyze and forecast commodity prices, offering actionable insights for market stakeholders.

Introduction

# The project focuses on analyzing daily price trends of various commodities across multiple markets in India. By leveraging this dataset, we aim to gain insights into pricing patterns, variations across regions, and other factors influencing market behavior. This study has significant implications for stakeholders, including farmers, traders, and policymakers. • This analysis provides actionable intelligence to stakeholders, such as farmers, traders, policymakers, and supply chain managers, enabling better decision-making, price forecasting, and market planning. Moreover, the findings aim to bridge existing gaps in understanding market efficiencies and bolster efforts towards stabilizing commodity prices.Ease of Use

## Selecting a Template

Before applying formatting and stylistic elements, ensure the core content of the paper is well-structured and comprehensive. Begin by outlining the key sections—Introduction, Objectives, Literature Survey, Methodology, and Conclusion—to establish a logical flow that reflects the project’s focus on commodity market visualization and analysis. Gather and organize all relevant data, including daily commodity price trends across Indian markets, and preprocess it to remove inconsistencies, as detailed in the Proposed Methodology. Draft the Introduction to highlight the significance of analyzing price fluctuations for stakeholders like farmers and traders, setting the stage for the study’s objectives. Incorporate findings from the Literature Survey to position your work against existing research, noting gaps such as limited real-time analysis that your project addresses. Detail the Proposed Methodology, emphasizing the use of tools like Streamlit, Pandas, and machine learning models (ARIMA, LSTM, Prophet) to ensure clarity on how insights are derived. Finally, compile initial results and insights to support the Conclusion, ensuring all claims are backed by evidence from the analysis. This preparation ensures the paper is cohesive and ready for stylistic refinement, aligning with the goal of delivering actionable market intelligence.

## Maintaining the Integrity of the Specifications

# Ensuring the integrity of data specifications is crucial for accurate and reliable commodities analysis. The standardization of data collection, formatting, and visualization ensures consistency across different datasets and facilitates meaningful comparisons. The following aspects must be maintained

# Prepare Your Paper Before Styling

Before formatting your paper on "Commodities Visualization Analysis Using Web Explorer," first draft and save the content as a separate text file. Complete all content development and structural editing—covering sections like Introduction, Objectives, Methodology, and Conclusion—before applying any formatting. Refer to sections A-D below for guidance on proofreading, spelling, and grammar specific to this project.  
Keep your text and graphic files (e.g., Matplotlib and Seaborn visualizations) separate until the text has been formatted and styled. Avoid using hard tabs, and restrict hard returns to a single return at the end of each paragraph. Do not manually add pagination anywhere in the paper, and refrain from numbering section headings, as the template will handle this automatically.

## Abbreviations and Acronyms

Define project-specific abbreviations and acronyms the first time they appear in the text, even if introduced in the abstract. For example, define "ARIMA" (AutoRegressive Integrated Moving Average), "LSTM" (Long Short-Term Memory), and "EDA" (Exploratory Data Analysis) upon first use. Standard technical abbreviations like SI, dc, or rms need not be defined. Avoid abbreviations in the title ("Commodities Visualization Analysis Using Web Explorer") or section headings unless absolutely necessary, such as in "LSTM-Based Forecasting."

## Units

 Use SI (MKS) units as the primary system for any measurements in your analysis (SI is preferred). If commodity prices are expressed in secondary units (e.g., Indian Rupees, ₹), include them in parentheses alongside SI equivalents where applicable. For instance, storage capacities like "50GB free space" from hardware requirements can remain as trade identifiers.

 Avoid mixing SI and CGS units; for example, do not combine "amperes" with "oersteds" if electrical analogies arise in your models. If mixed units are unavoidable, explicitly specify units for each variable in equations.

 Use consistent unit notation: write "₹/kg" or "rupees per kilogram," not "rupees/kg." In text, spell out units fully, e.g., "price increased by a few rupees," not "a few ₹."

 Use a zero before decimal points: "0.25 ₹/kg," not ".25 ₹/kg." Use "cm³," not "cc," if spatial metrics appear in supply chain data.

## Equations

Equations in this project, such as those used in ARIMA or LSTM forecasting models, may deviate from the standard text font. Determine whether equations should use Times New Roman or Symbol font based on symbols involved (avoid other fonts). Complex multilevel equations, like those for price prediction, may need to be treated as graphics and inserted after styling.  
Number equations consecutively, placing numbers in parentheses flush right, e.g., (1), using a right tab stop. To save space, use a solidus ( / ), exp function, or exponents where appropriate. Italicize Roman symbols (e.g., *P* for price), but not Greek symbols (e.g., γ). Use a long dash (—) for minus signs, not a hyphen (-). Punctuate equations within sentences, as shown:  
*P(t) + S(t) = T(t)* (1)  
where *P(t)* is the predicted price, *S(t)* is seasonal variation, and *T(t)* is the total trend at time *t*. Center equations using a center tab stop. Define all symbols (e.g., *P(t)*) before or immediately after the equation. Use "(1)," not "Eq. (1)" or "equation (1)," unless starting a sentence: "Equation (1) predicts price trends."

## Some Common Mistakes

 Treat "data" as plural: "The commodity price data *are* analyzed," not "data *is* analyzed."

 For constants like the permeability of vacuum (μ₀) in any theoretical models, use subscript zero, not a lowercase "o."

 In American English (if applicable), place commas and periods inside quotation marks only for full quotes or titles, e.g., "Price Trends in India." For emphasis, like "real-time" data, punctuation goes outside. Parenthetical phrases follow this rule: (like this), while parenthetical sentences end within (This is complete.).

 Use "inset" for a graph within a graph (e.g., a zoomed price trend), not "insert." Prefer "alternatively" over "alternately" unless describing oscillation in market patterns.

 Avoid "essentially" for "approximately" in phrases like "essentially accurate forecasts"; use "roughly" or "effectively" as appropriate.

 In your title, "using" fits naturally ("that uses" wouldn’t replace it), so keep "u" lowercase.

 Distinguish "affect" (market factors *affect* prices) from "effect" (visualizations *effect* better decisions), and "discrete" (distinct markets) from "discreet" (subtle trends).

 Write "nonlinear" without a hyphen, and note no period follows "et" in "et al." (e.g., Singh et al.). Use "i.e." for "that is" and "e.g." for "for example."

# Using the Template

Once the text editing for "Commodities Visualization Analysis Using Web Explorer" is complete, the paper is ready for the template. Duplicate the template file using the Save As command, and name it according to the naming convention specified by your conference (e.g., Batch81\_Commodities\_Visualization). In this new file, highlight all contents and import your prepared text file containing the project content. You are now ready to style your paper using the scroll-down window on the left of the MS Word Formatting toolbar.

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## Identify the Headings

| **Heading Type** | **Example in Your Paper** | **Formatting Style** |
| --- | --- | --- |
| **Paper Title** | Commodities Visualization Analysis Using Web Explorer | **Bold, Centered, Title Case** |
| **Authors & Affiliations** | K. Sai Krishna,  P. Narender,  K. Abyudhay,  K. Srikar Reddy | Normal, Centered, One Column |
| **Abstract** | (*Your abstract text goes here*) | *Italicized text, justified* |
| **Main Section Headings** | I. Introduction, II. Methodology, III. Results and Discussion | **Bold, Capitalized, Roman Numerals** |
| **Sub-section Headings** | A. Data Collection, B. Data Processing | **Bold, Capitalized, Alphabetical Order** |
| **Sub-subsection Headings** | 1. Missing Value Handling, 2. Outlier Detection | **Bold, Sentence Case, Numbered** |
| **Figure Captions** | Figure 1: Commodity Price Trends | *Italicized, Below the Figure* |
| **Table Headings** | Table 1: Commodity Price Summary | **Bold, Above the Table** |
| **Acknowledgments & References** | Acknowledgments, References | **Bold, Heading 5 Style** |

## Figures and Tables

**TABLE I. HARDWARE/SOFTWARE REQUIREMENTS**

| **Table** | **Specification** |
| --- | --- |
| **Hardware** |  |
| Processor | Intel Core i5 or higher |
| RAM | 8GB minimum |
| Storage | 50GB free space |
| **Software** |  |
| Programming | Python 3.11 (Pandas, etc.) |
| Visualization | Streamlit |

##### This section presents the key findings from the analysis, along with statistical insights.

##### **Table 1: Commodity Price Summary**

| **Commodity** | **Min Price** | **Max Price** | **Average Price** | **Volatility (%)** |
| --- | --- | --- | --- | --- |
| Wheat | 1500 | 2100 | 1800 | 5.6 |
| Rice | 2000 | 2800 | 2400 | 6.2 |
| Soybean | 3200 | 4500 | 3850 | 7.1 |

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