East-West Analytics Project Plan

Background/context and clearly defined problem statement:

VP Analytics is a data analytics consultancy providing Data Analytics as a Service to clients operating in highly competitive and time-sensitive markets where information advantages are critical.

Earnings announcements represent key market events that often trigger significant stock price volatility, creating both opportunity and risk for investors. This analysis examines the relationship between earnings data, stock price movements, and macroeconomic conditions to answer the question: do large-cap technology stocks exhibit consistent price and volatility patterns around earnings announcements, and how do financial metrics and macroeconomic conditions interact to shape these patterns in a way to inform hedge fund trading and risk-management strategies?

By answering this, VP Analytics can support hedge funds in evaluating strategy effectiveness and developing more robust, data-driven investment strategies.

Sub-questions supporting our main question:

- Are there consistent pre- or post-earnings price behaviours across Apple, NVIDIA, and Google?
- Does the strength or weakness of reported financial metrics influence the direction or magnitude of earnings reactions?
- How do different macroeconomic regimes alter earnings-related price behaviour in growth-oriented technology stocks?

Academic research on event study methodology was referenced. Event study methodology is widely used for measuring how markets respond to discrete information events such as earnings announcements, by comparing observed stock returns around the event to expected “normal” returns (MacKinlay, 1997).

Team roles and ways of working:

Our team will collaborate using digital tools supporting both technical work and day-to-day coordination. Google Docs will be used for shared writing, GitHub will be used to ensure version control and smooth integration of Python code, andWhatsApp for quick discussions, clarifications, and scheduling. Weekly meetings will be held at a time that accommodates members across time zones.

Work will be distributed based on the project's three analytical focus areas, with each member contributing according to their strengths. Adrian and Stephan, who excel in analytical reasoning and interpreting market behaviour, will lead the earnings-price movement workstream. Wenita, whose strengths include synthesis and structured thinking, will focus on financial metrics and ensure coherence across written outputs. Cellini and Luis, both strong in quantitative analysis, will examine macroeconomic factors, with Luis additionally serving as Technical Lead given his Python expertise. He will also support AI-driven news and sentiment analysis to enhance analytical depth. The teams described above are as follows:

- Team 1: Stephan & Adrian
- Team 2: Wenita
- Team 3: Cellini & Luis

To maintain accountability, the project lead role will rotate across phases: Stephan during planning, Luis during analysis coordination, and Adrian during presentation development. Meetings will include time for members to raise concerns or request support, ensuring workload balance and early problem-solving. Between meetings, WhatsApp and GitHub discussions will help maintain clarity around task ownership and deadlines. Key risks include scope creep and inconsistency across parallel workstreams. These will be managed through clearly defining research questions, holding regular check-ins and setting a dedicated synthesis phase to align findings into a unified narrative.

Project plan:

Initial project planning:

The planning phase focused on defining the business problem, agreeing analytical scope, and producing a project roadmap. Common definitions (timeline, companies, core metrics) were agreed on early to prevent scope creep. The team also explored API-based data collection (e.g. Yahoo Finance) and AI-assisted tools to reduce manual workload.

Phase 1: Data sourcing, preparation, and initial exploration
This phase focuses on sourcing, cleaning, and aligning all required datasets.

- Team 1 will collect daily Open-High-Low-Close price data and define earnings event windows.
- Team 2 will gather earnings-related financial metrics and format them consistently across companies.
- Team 3 will source macroeconomic indicators such as interest rates and inflation, aligning them with earnings events.

Initial exploratory analysis will be conducted to visualise basic patterns, volatility behaviour, and anomalies,generating early hypotheses and providing a foundational understanding of available data.

Phase 2: Focused analysis
Each team will conduct detailed analysis within its focus area.

- Team 1 will analyse pre-earnings drift, announcement-day reactions, and post-earnings price and volatility behaviour.
- Team 2 will examine how different earnings outcomes and financial profiles relate to observed market reactions.
- Team 3 will evaluate whether earnings behaviour changes across macroeconomic regimes.

Regular group check-ins will ensure insights are shared to find early indicators of interrelated influences and to ensure independent progress.

Phase 3: Holistic analysis
All members collate findings into a single analytical narrative to assess how earnings behaviour, financial outcomes, and macroeconomic conditions interact, rather than presenting isolated results. Predictive relationships will be back tested to ensure they are statistically robust and to prevent bias.

Phase 4: Strategic & inferential conclusions
The final phase focuses on converting the findings into strategic conclusions that link clearly to the business problem. Risks such as over-interpreting trends or applying inconsistent assumptions will be managed through peer review and regular cross-checks. This follows finalising the report, presentation, and a reusable Python framework for future analysis.

Analytical approach:

The analysis will follow a structured, phased methodology designed to ensure data quality, analytical rigour, and clear identification of earnings-related patterns. Work will be conducted primarily in Python, using *pandas* for data cleaning and structuring, *NumPy* for numerical calculations, *matplotlib* and *seaborn* for visualisation, and *statsmodels* for statistical testing and validation, and scikit-learn for prediction and model performance.

Note: Some phases overlap. See Appendix.

Phase 1 (7 days)

Stock price data, earnings dates, financial metrics, and macroeconomic indicators will be cleaned and aligned to a common timeline. This includes handling missing values, defining fixed earnings event windows, and creating derived variables such as event-window returns and volatility measures.

Key milestone: a fully cleaned and aligned dataset ready for analysis.

Phase 2 (14 days)

Event-study style analysis will be used to examine pre and post-earnings price behaviour. Financial metrics and macroeconomic conditions will be used to segment earnings events into regimes, supported by summary statistics, distribution analysis, and visual diagnostics.

Key milestone: validated findings for each analytical focus area.

Phase 3 (14 days)

Results from all focus areas will be combined to examine interrelated effects. Simple back-testing techniques will assess whether identified patterns are consistent across multiple earnings cycles and market conditions.

Key milestone: robustness-checked, integrated insights.

Phase 4 (21 days)

Findings will be collated into strategic insights and presented through a final report, presentation, and a reusable Python analysis framework.

Appendix:
Please refer to the separate “East-West Analytics_LSE_EP_Assignment1_Appendix” document for a project roadmap.

PROJECT: Analysis of Earning-Related Factors Impact on Stock Prices for VP Analytics

Project start date: 18/1/2026

Scrolling increment: 4

Task Description	Details	Assigned to	Progress	Start Date	Starts on Day
Phase 0: Complete Project Plan + Roadmap, Project Charter	-Project Plan: Include problem statement and business questions, and this Project Roadmap (in Appendix) -Submit Project Charter	All	**25%**	18/1/2026	0
Phase 1: Data Sourcing, Preparation, and Initial Exploration	-Find relevant data from public sources -Extract and clean the data -Initial exploratory analysis & formulate hypotheses	All	**0%**	25/1/2026	7
Phase 2: Focused Analysis	-Team 1 will analyse pre-earnings drift, announcement-day reactions, and post-earnings price and volatility behaviour. -Team 2 will examine how different earnings outcomes and financial profiles relate to observed market reactions. -Team 3 will evaluate whether earnings behaviour changes across macroeconomic regimes, both interest rates and inflation.	All	**0%**	1/2/2026	14
Phase 3: Holistic Analysis	-Results from all focus areas will be combined to examine interrelated effects. -Simple back-testing techniques will assess whether identified patterns are consistent across multiple earnings cycles and market conditions.	All	**0%**	1/2/2026	14
Stage 4: Strategic & Inferential Conclusions	-Findings will be collated into strategic insights and presented through clear visualisations, a final report, and a reusable Python analysis framework.	All	**0%**	8/2/2026	21
4A: Prepare (first) presentation materials	-Decide on key messages and structure for Employer Partner Initial Recommendation Presentation -Prepare materials for EP Initial Recommendation Presentation	All	**0%**	8/2/2026	21
4B: Deliver first presentation, prepare for second presentation	-Prepare for and deliver Employer Partner Initial Recommendation Presentation (due Feb 23, 13:00 UK time) -Decide on key messages and structure for Employer	All	**0%**	15/2/2026	28
4C: Deliver second presentation, prepare group report	-Prepare for and deliver Employer Partner Final Presentation (due Mar 2, 13:00 UK time) -Prepare Final Report (due 3/2, 13:00 UK time)	All	**0%**	22/2/2026	35
4D: Prepare individual report	-Prepare and submit individual reports (due Mar 5, 13:00 UK time)	All	**0%**	22/2/2026	35