COM480 Milestone 2 - Sundial

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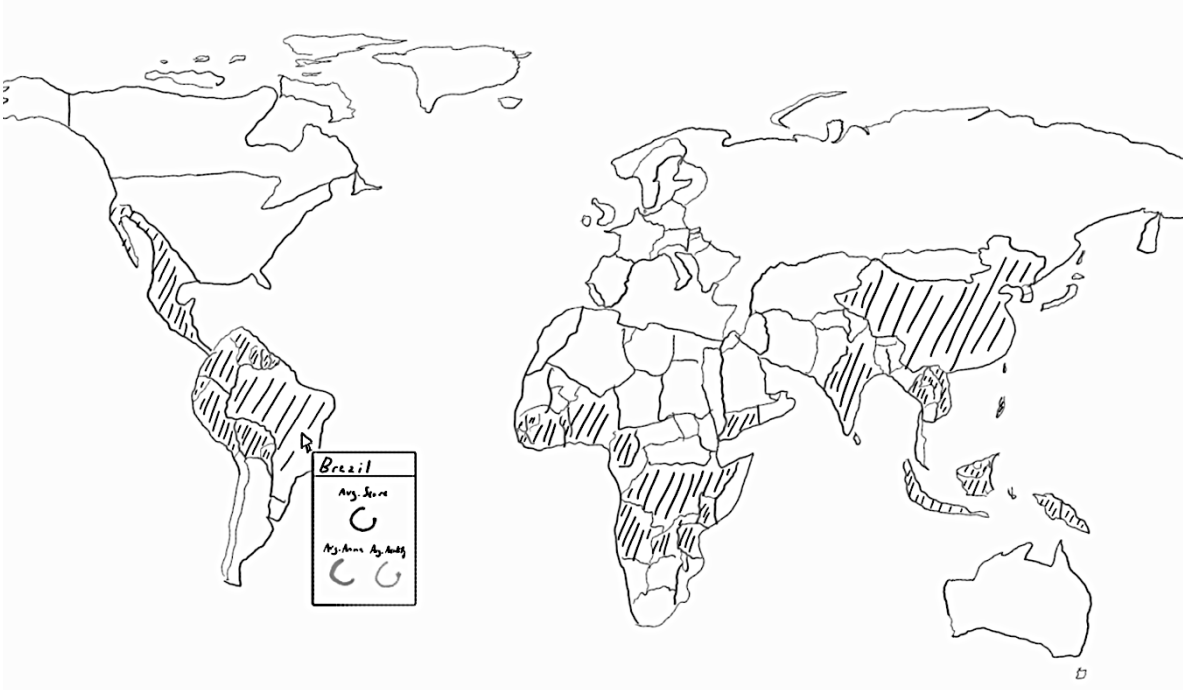
Project Goal – Coffee Market Dynamics

Our project creates an interactive platform revealing connections between coffee production, quality, trade, and pricing. We will transform complex market data into intuitive visualizations that help coffee enthusiasts, analysts, and students understand coffee's global ecosystem. Users will explore how geography influences coffee quality, how market forces shape pricing, and how international trade networks distribute this commodity worldwide.

Visualization Design

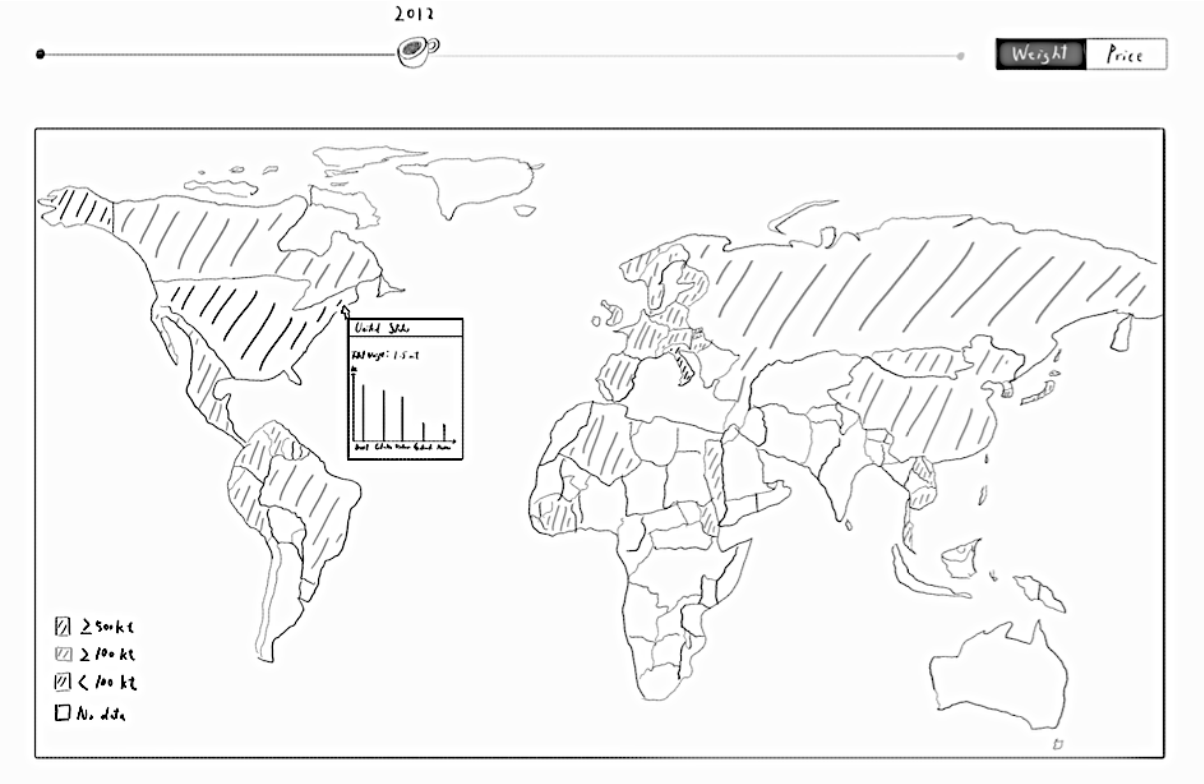
Geographic Quality Map

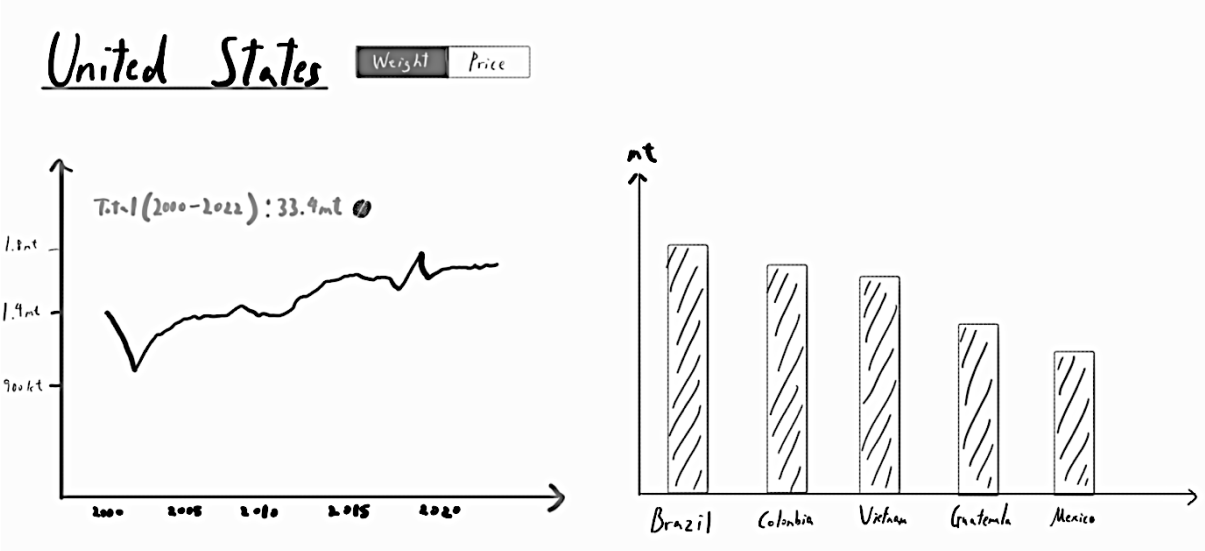
Our interactive world map will display coffee-producing regions color-coded by quality scores. Users can filter by attributes like aroma, flavor, acidity, and body to reveal how factors like altitude influence specific coffee characteristics. The visualization includes heat map overlays, pop-up regional details, altitude correlation displays, and quality attribute filters.



Global Trade Flow Visualization

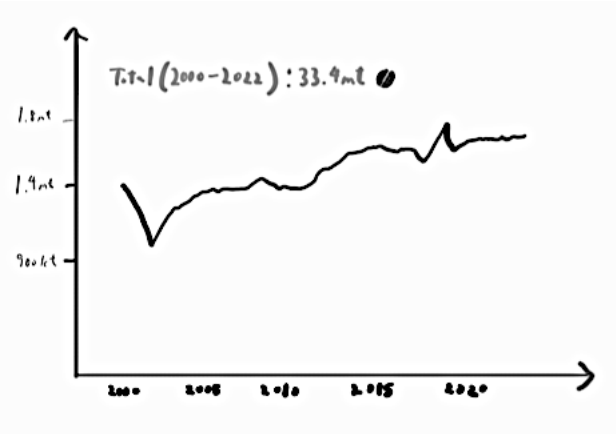
This dynamic visualization illustrates coffee bean flows between producing and consuming countries from 2000-2022. Features include animated flow lines proportional to trade volume, time-based animation, country-specific highlighting, and filtering options for importers and exporters. This reveals changing trade relationships and volume patterns over time.





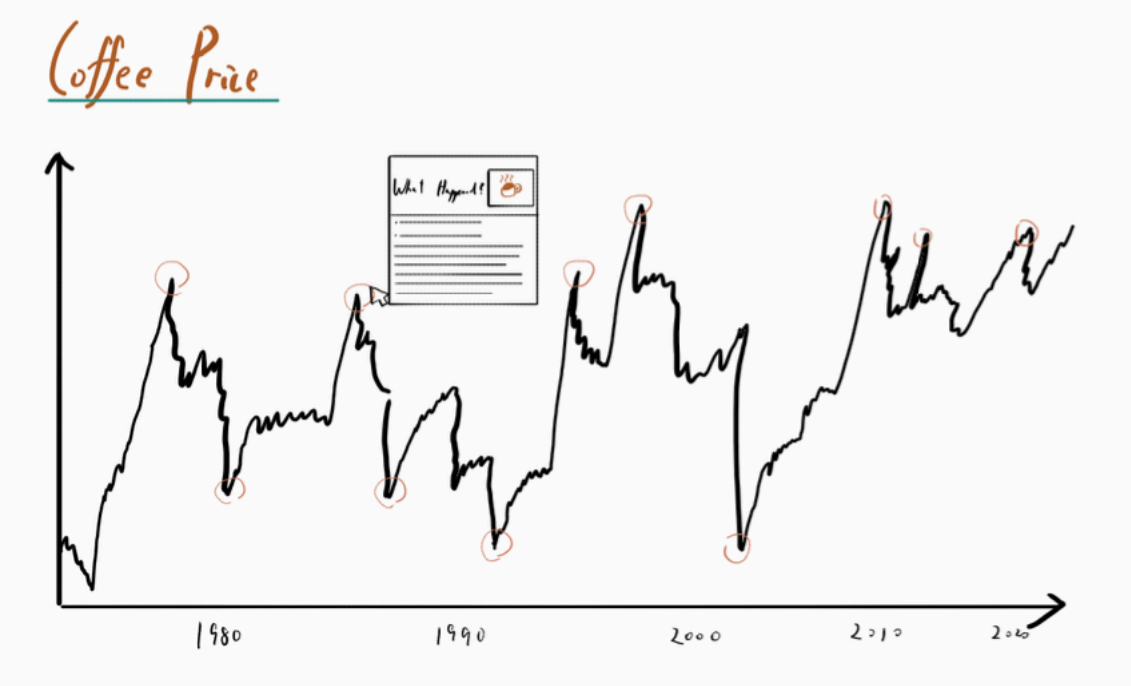
Production Timeline Dashboard

Our dashboard tracks coffee production trends from 2015-2024, helping users identify patterns and anomalies. It combines area charts showing production volume by country, line charts for global totals, annotations for significant market events, and interactive filtering by region and time period.



Price Analysis Visualization

This tool displays historical coffee prices from 1975-2025 with inflation adjustments and production correlations. It features multi-line charts showing nominal and adjusted prices, volatility indicators, correlation panels linking prices to production data, and highlighted periods of significant market events.



Tools and Implementation

We will implement our visualizations using D3.js as our primary library, supplemented with specialized tools for specific components. The Geographic Quality Map utilizes Leaflet.js for mapping functionality, while the Trade Flow Visualization incorporates animation techniques for temporal data representation. The Production Timeline and Price Analysis visualizations leverage D3.js's robust graphing capabilities with Crossfilter.js for multi-dimensional filtering.

These tools align with key visualization concepts from lectures on geographic visualization, interactive systems, time series representation, and multi-view coordination. Our implementation emphasizes responsive design principles to ensure accessibility across devices.

Implementation Strategy

Core MVP Components

Our minimum viable product consists of five essential components:

1. A responsive website framework with consistent navigation and data loading infrastructure
2. A basic geographic map showing top coffee regions with simple quality metric encoding
3. A simplified trade flow display showing major routes with basic year filtering
4. An essential production timeline showing top producers with year range selection
5. A fundamental price tracker displaying historical trends with basic comparison features

This core functionality provides a complete coffee market overview while establishing the technical foundation for enhanced features.

Enhanced Features

With our foundation established, we'll implement advanced features that deepen user engagement:

1. Advanced quality analysis with detailed altitude-flavor correlations and comparative tasting notes

2. Dynamic trade network visualization with animated temporal changes and economic impact analysis
3. Interactive production explorer with climate data overlays and harvest timing visualization
4. Comprehensive price analytics with external factor correlation and volatility prediction

These enhancements will transform our visualization from informative to truly insightful, though each can be implemented independently without compromising the core experience.

Functional Prototype

Our current prototype demonstrates the fundamental components while maintaining a cohesive narrative. The responsive framework connects all visualizations with consistent design language. Each visualization component includes basic interactivity and data representation, with placeholders for advanced features. This modular architecture ensures independent functionality while contributing to a comprehensive understanding of the global coffee market.