Market Intelligence:
Opportunity Discovery

March 31, 2021

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Outline
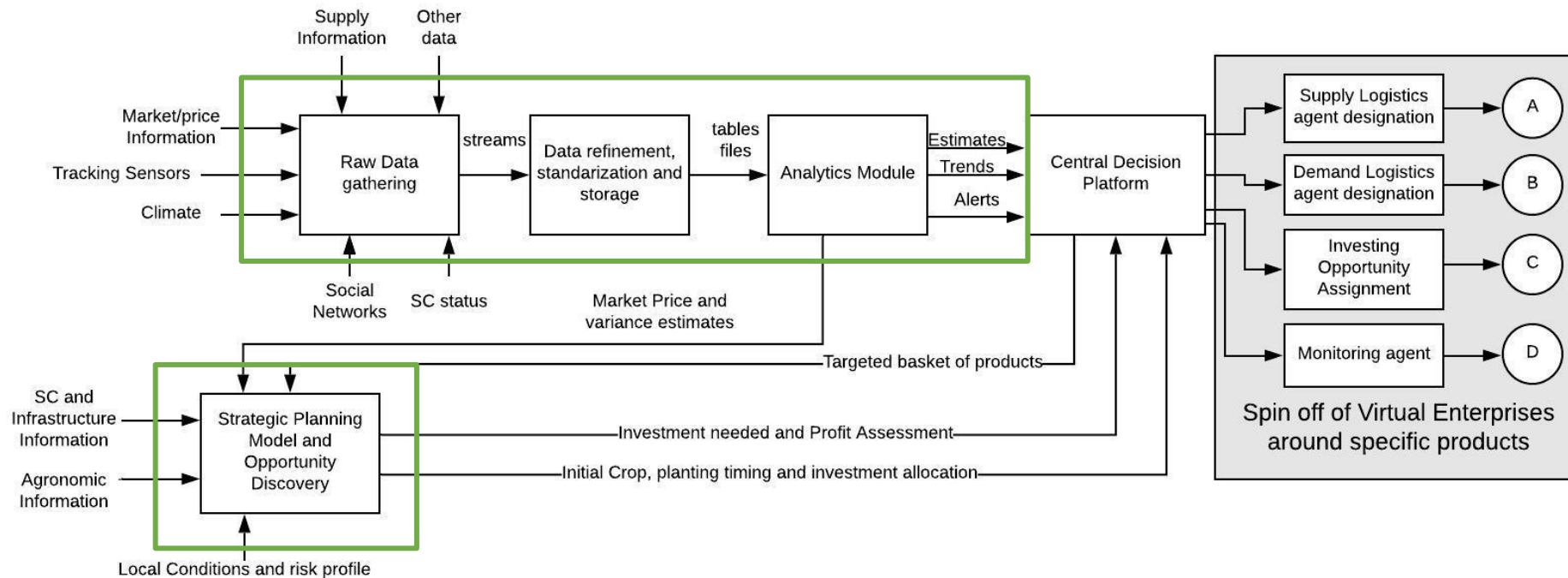
Overview and vision

Opportunity discovery description

Layered system approach

Case study

Future work

Market Intelligence Vision

An integrated intelligence system continuously assessing relevant market signals to identify and recommend actionable opportunities.

Market Intelligence Components

Source Data Integration

Data Source Identification

Data Download
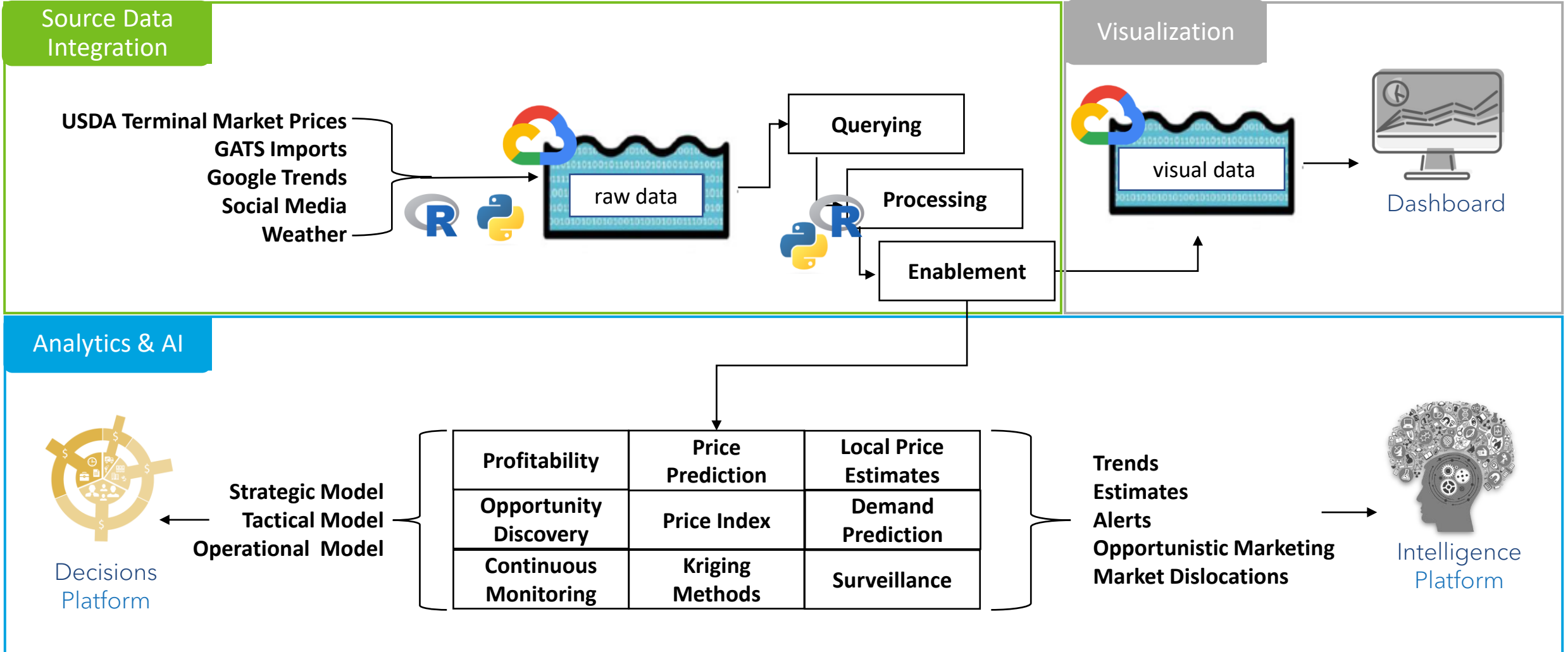
Storage Creation

Processing Codes

Analytics & AI

Price Prediction Models

Demand Estimation

Yield Models

Signal Monitoring and Diagnosis

Visualizations

Data Summaries

Analyzed Data Visuals

Intelligence Visuals

Platform Creation

Market Intelligence Component Interactions

Source Data Integration

USDA Terminal Market Prices
GATS Imports
Google Trends
Social Media
Weather

raw data

Querying

Processing

Enablement

Visualization

visual data

Dashboard

Analytics & AI

Strategic Model
Tactical Model
Operational Model

Decisions Platform

Profitability	Price Prediction	Local Price Estimates
Opportunity Discovery	Price Index	Demand Prediction
Continuous Monitoring	Kriging Methods	Surveillance

Trends
Estimates
Alerts
Opportunistic Marketing
Market Dislocations

Intelligence Platform

# Analytics & AI: Opportunity Discovery

Detect: Opportunity signals based on leading indicators such as market prices, import value and volume, web data, among others.

Diagnose: Validate, estimate impact and duration and demand generation.

Evaluate: Feasibility of capturing the opportunity in terms of the required resources and provides an estimate of its profitability.
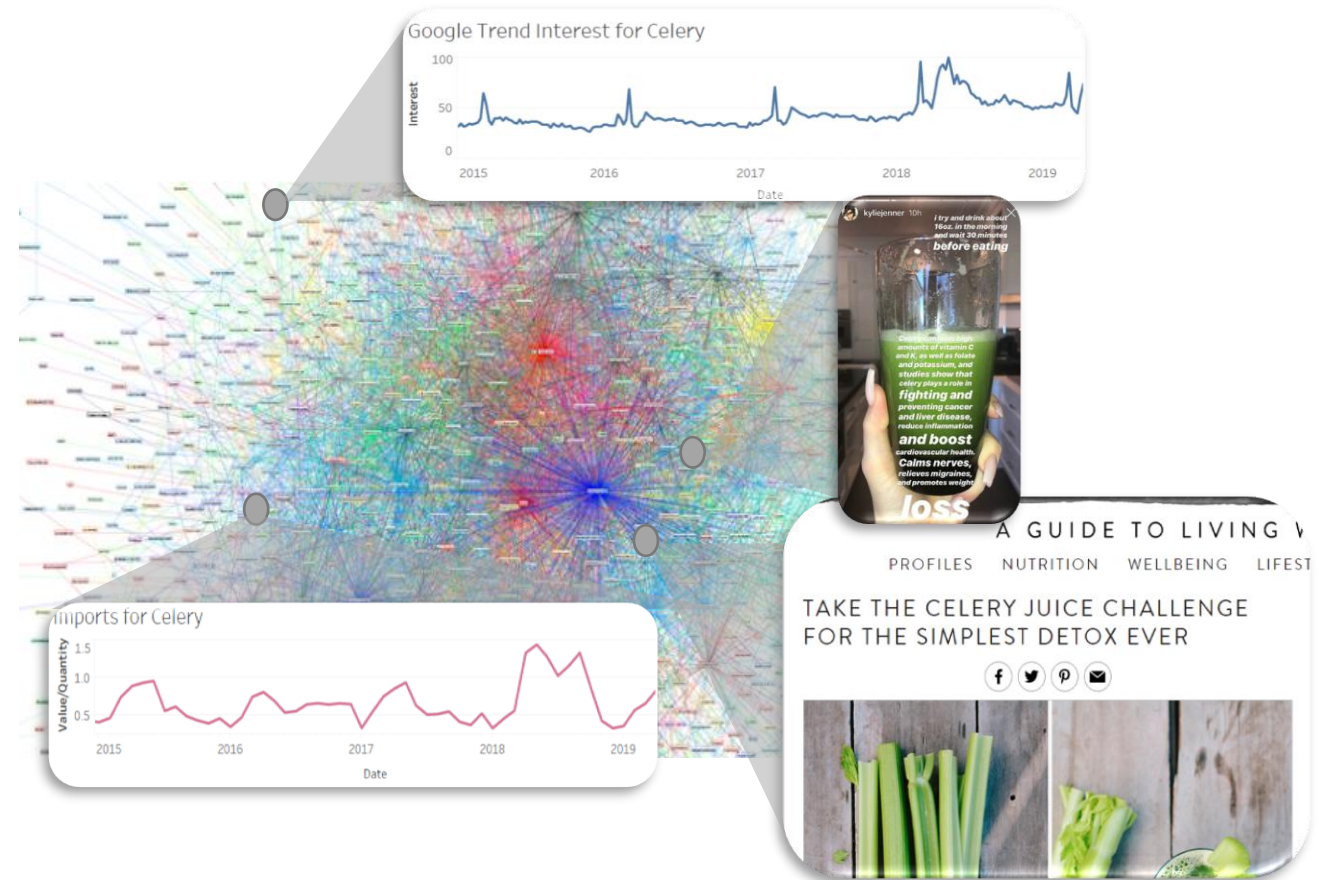
Opportunity Discovery: Layered Systems Approach

Opportunity Monitoring Layer System
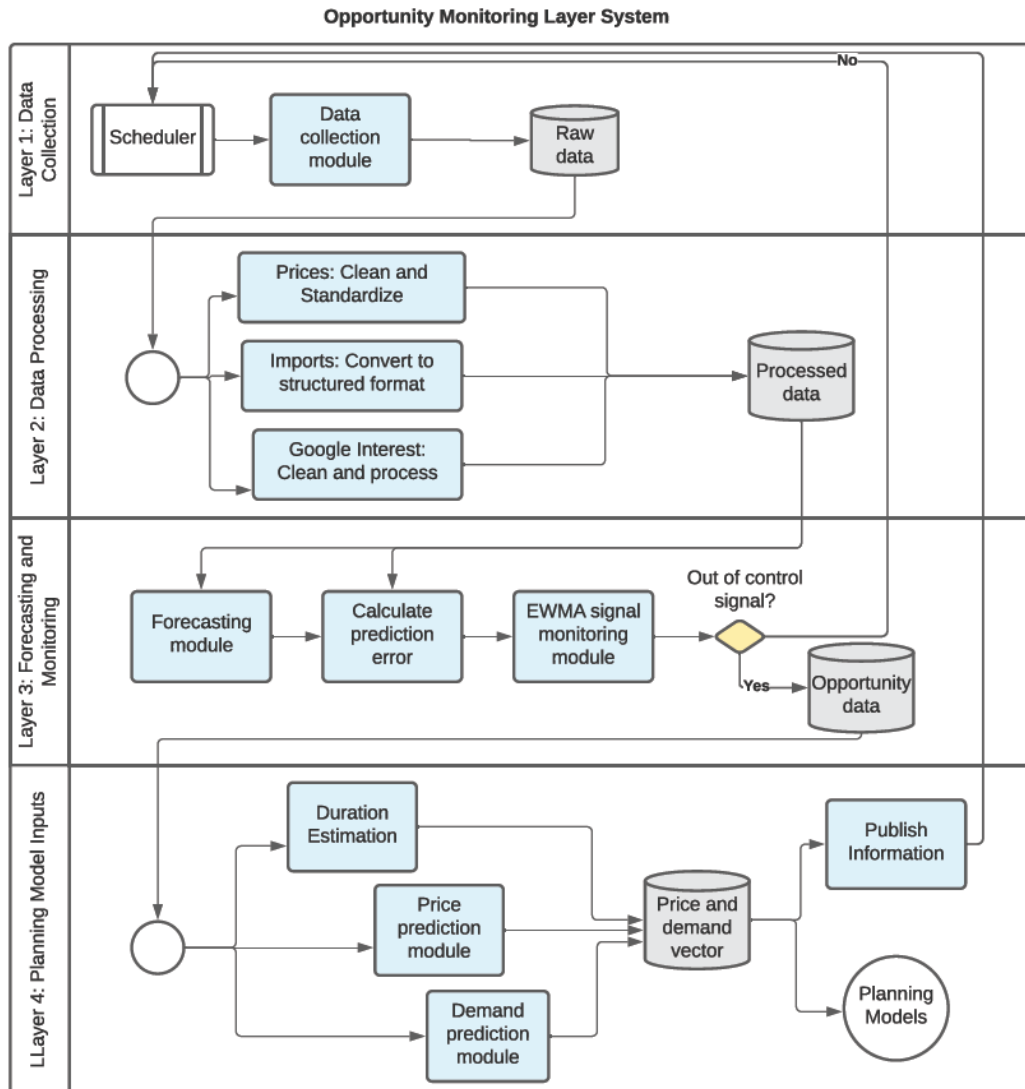
- **Layer 1:** Data collection through APIs and custom adapters and automation and storage.

- **Layer 2:** Clean and process for each data source with using custom software.

- **Layer 3**: Data monitoring using statistical control methods to detect signals and diagnose them as possible opportunities or false alarms.

- **Layer 4**: Evaluate the opportunity in terms of its estimated duration and demand generation.

Case Study: Import Data Monitoring

To illustrate the functionalities of the opportunity discovery module, consider the imports data of spinach over time. Note that both the value and volume of spinach considerably increase near the year 2015. The goal of opportunity discovery is to detect this change and provide a signal.
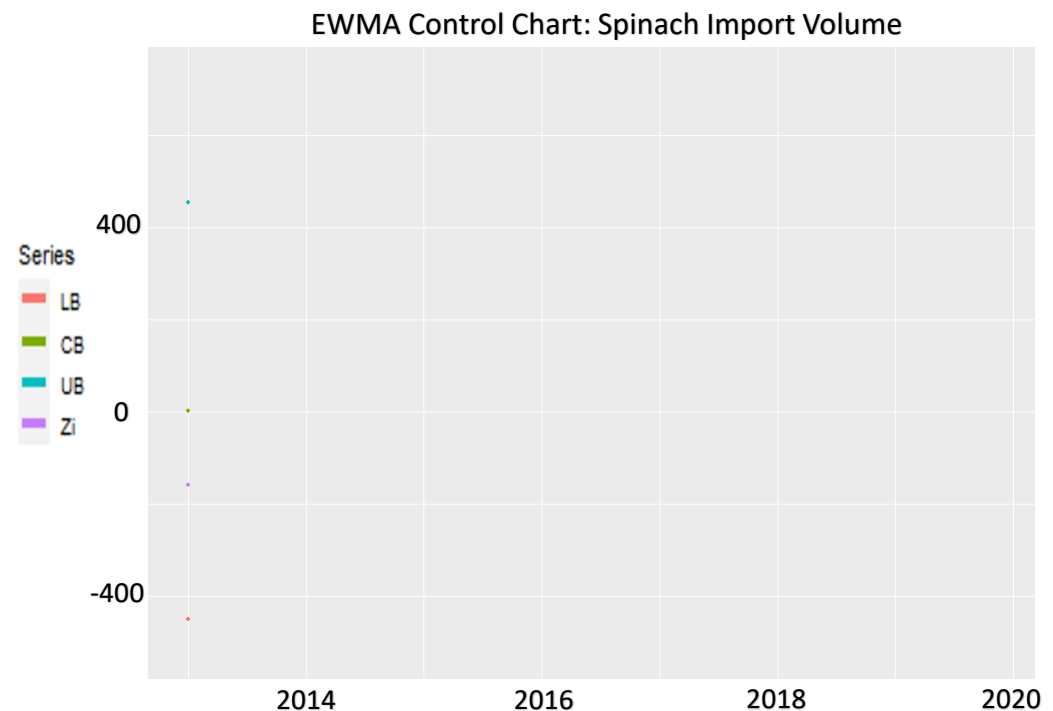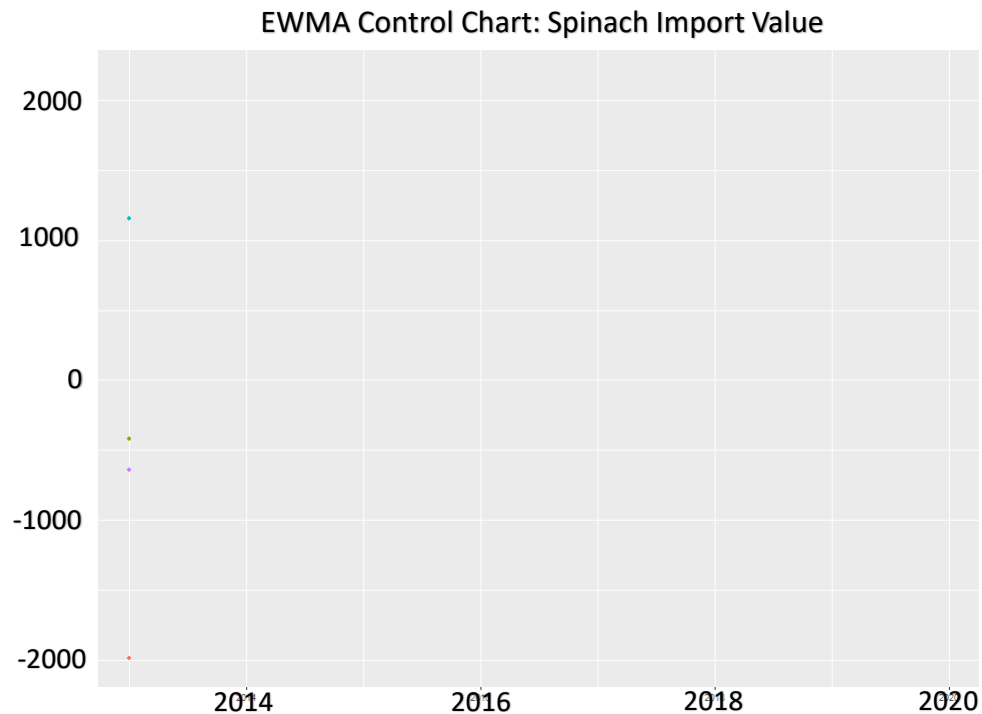

Spinach Import Value

Spinach Import Volume
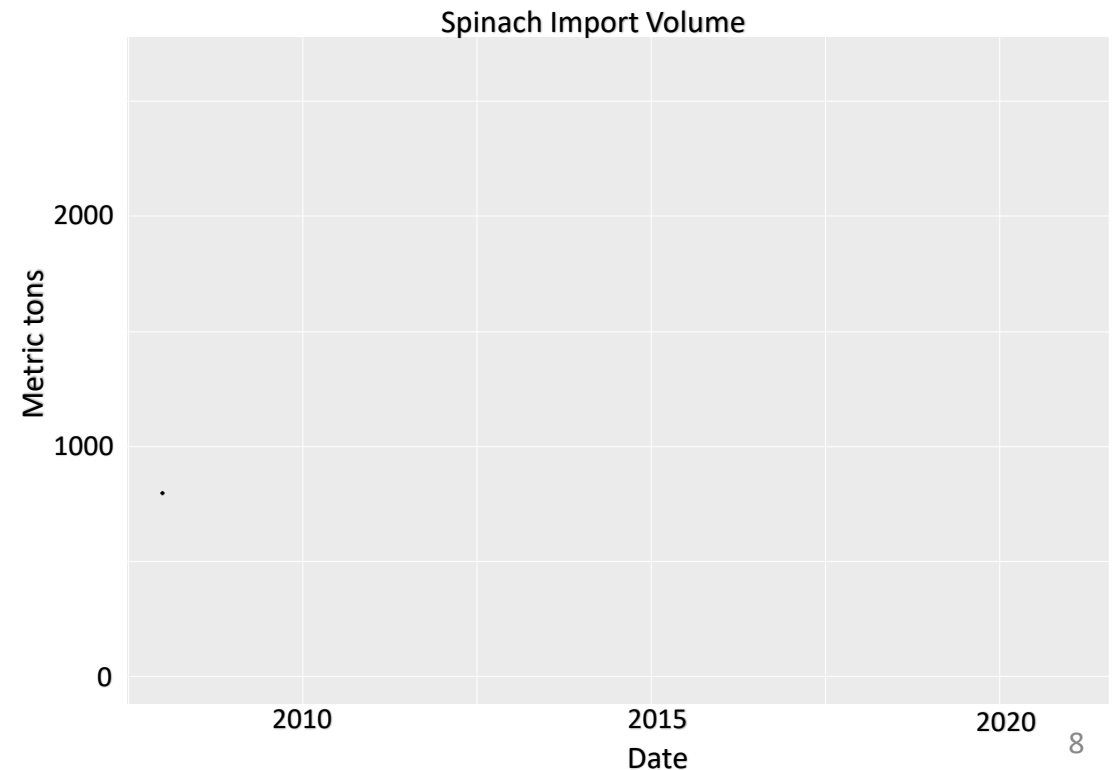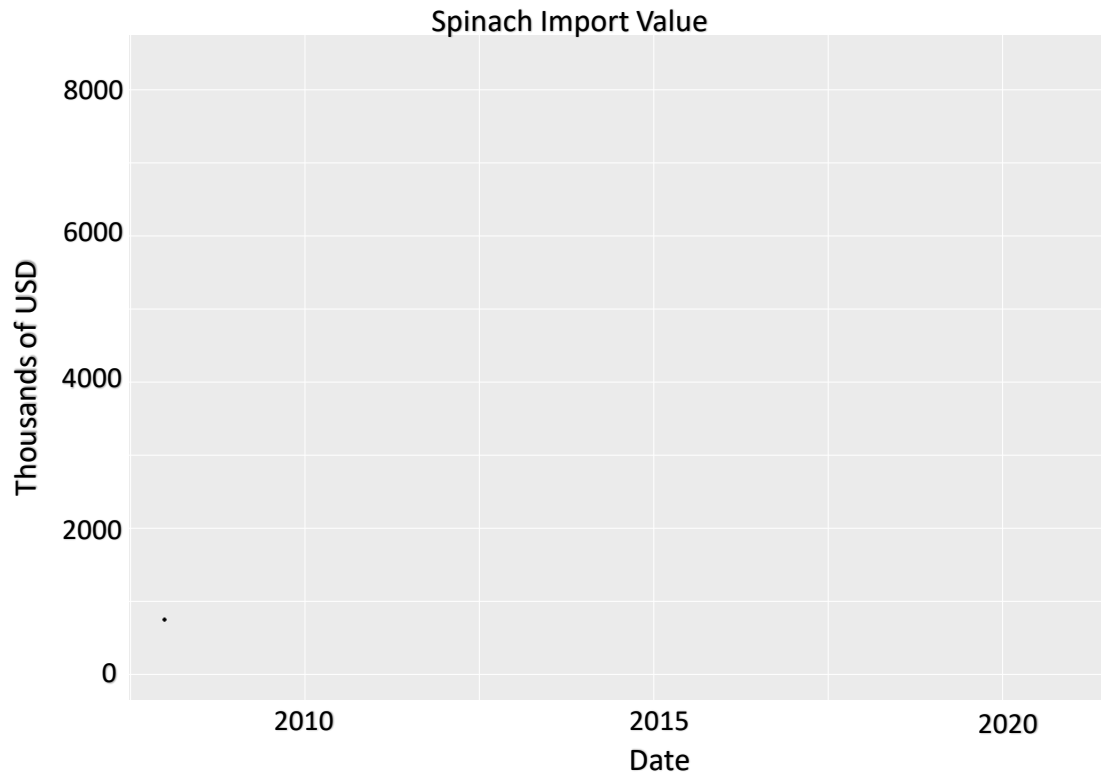
# Case Study: Import Data Monitoring (Cont.)

A signal is detected for spinach's import value, volume, and price.

This signal may imply that there has been a change in the imports of spinach which in this case reflect the abrupt increase of the import value and volume of spinach.

EWMA Control Chart: Spinach Import Value

EWMA Control Chart: Spinach Import Volume

Series
- LB
- CB
- UB
- Zi

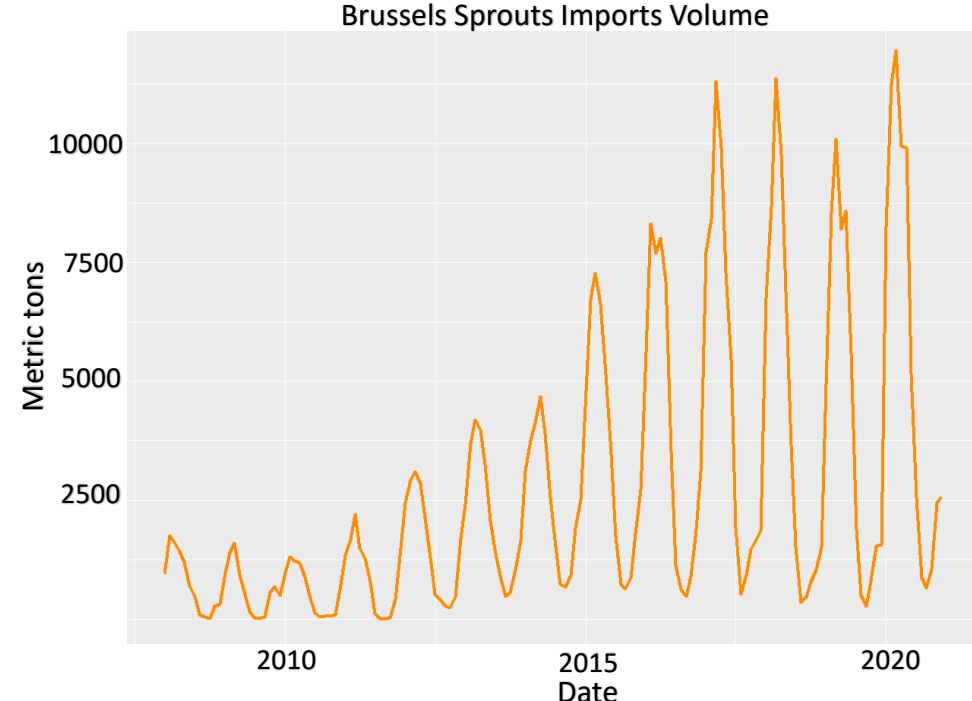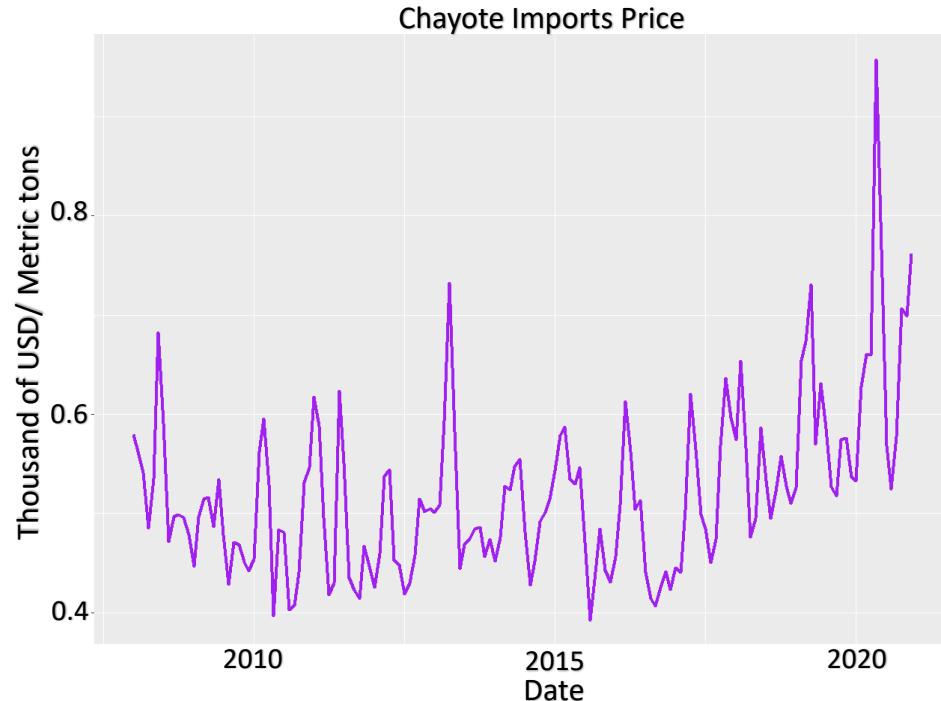# Case Study: Import Data Monitoring (Cont.)

Is an opportunity present in every time period and crop?

Onion Import Volume
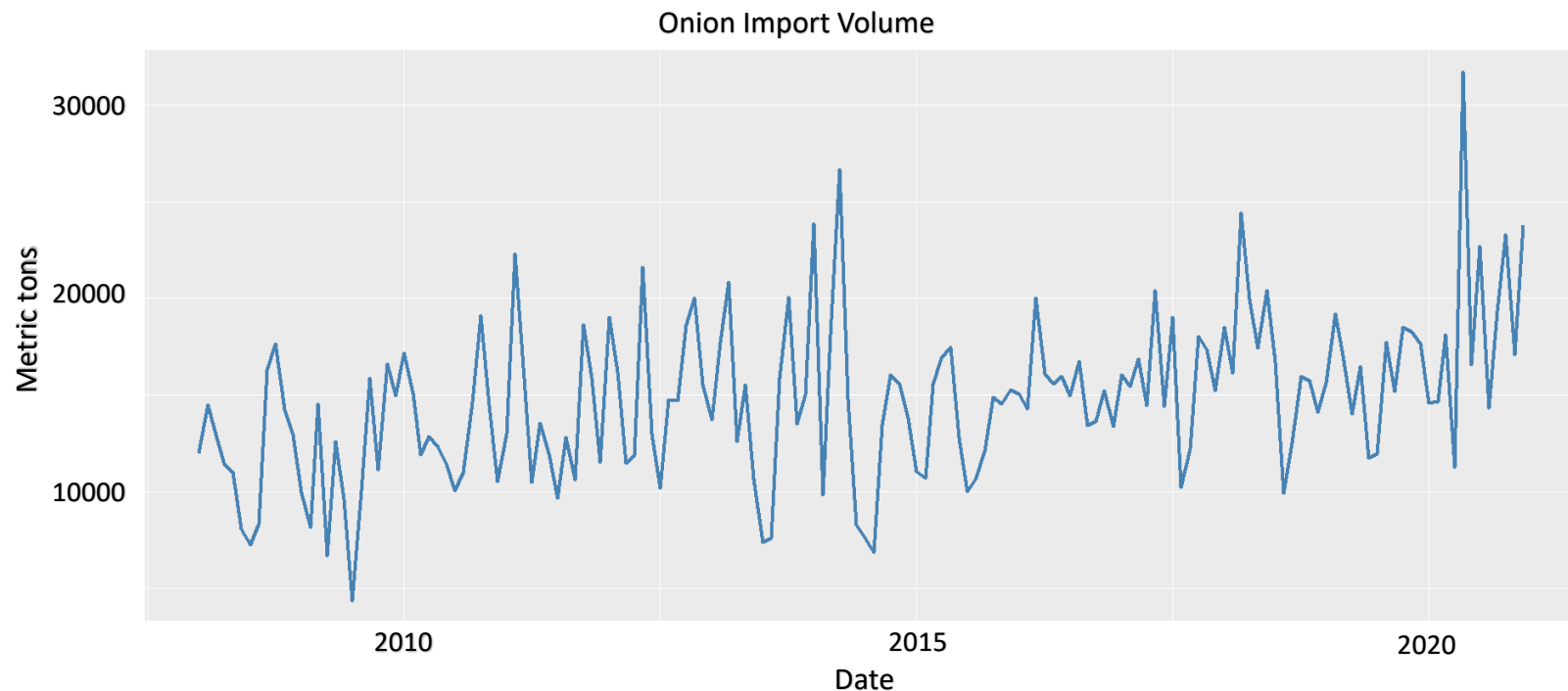
Case Study: Additional Crops Imports

Methodology can identify signals in exotic crops such as chayote.

Chayote as well as Brussels sprouts illustrate the following sections of the case study.

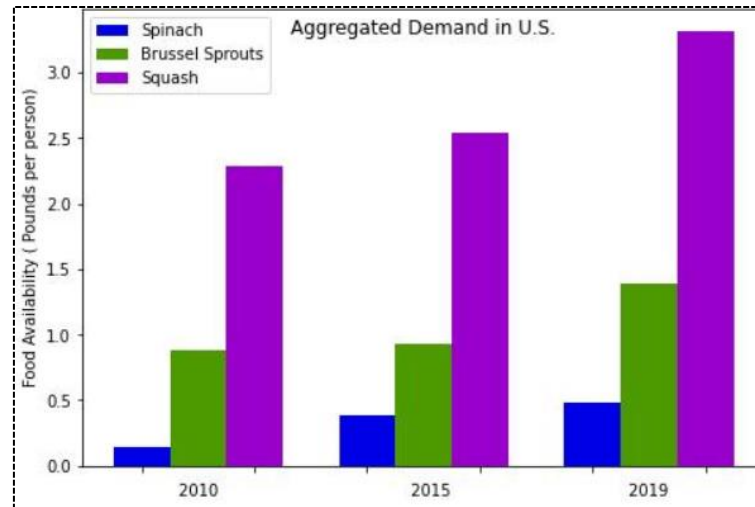# Case Study: Other Indicators to Monitor

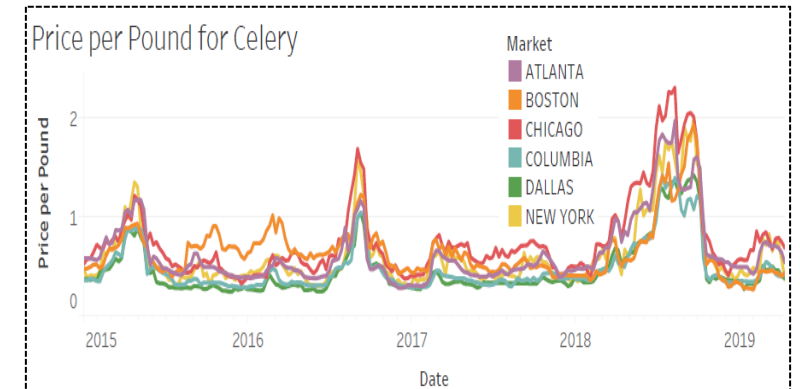| Google Trends	Annual Consumption	Market Prices
Interest over time indicator based on the amount of Google searches.	Estimation of the consumption of crops by location through time.	Terminal and local market prices of crops though time.

Market Intelligence: Next Steps

- Integrated analytics of multiple data sources

- Enhanced evaluation of opportunities

- More regional estimates and recommendations

Conclusion

- Opportunity discovery detects market dynamics (via leading indicators) that can be beneficial to fresh produce stakeholders
  - Three crops were selected to illustrate the following steps of the process: spinach, chayote, and Brussels sprouts
- Essential to verify if the opportunity is capturable by small growers
  - Provides diagnosis, the next step of the process is to evaluate its feasibility and estimate its profitability.

THANK **Y**OU

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