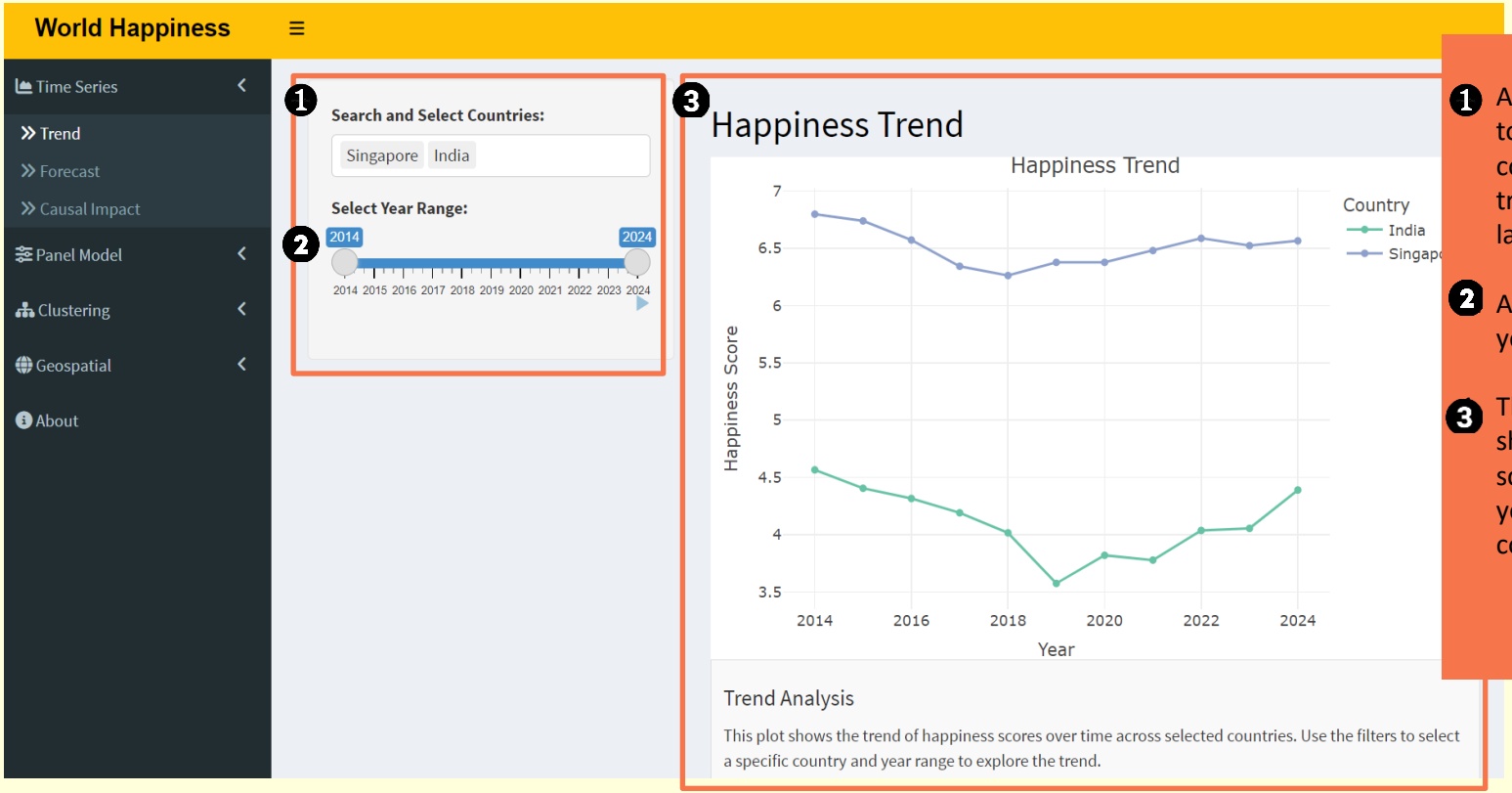
World Happiness Visualization

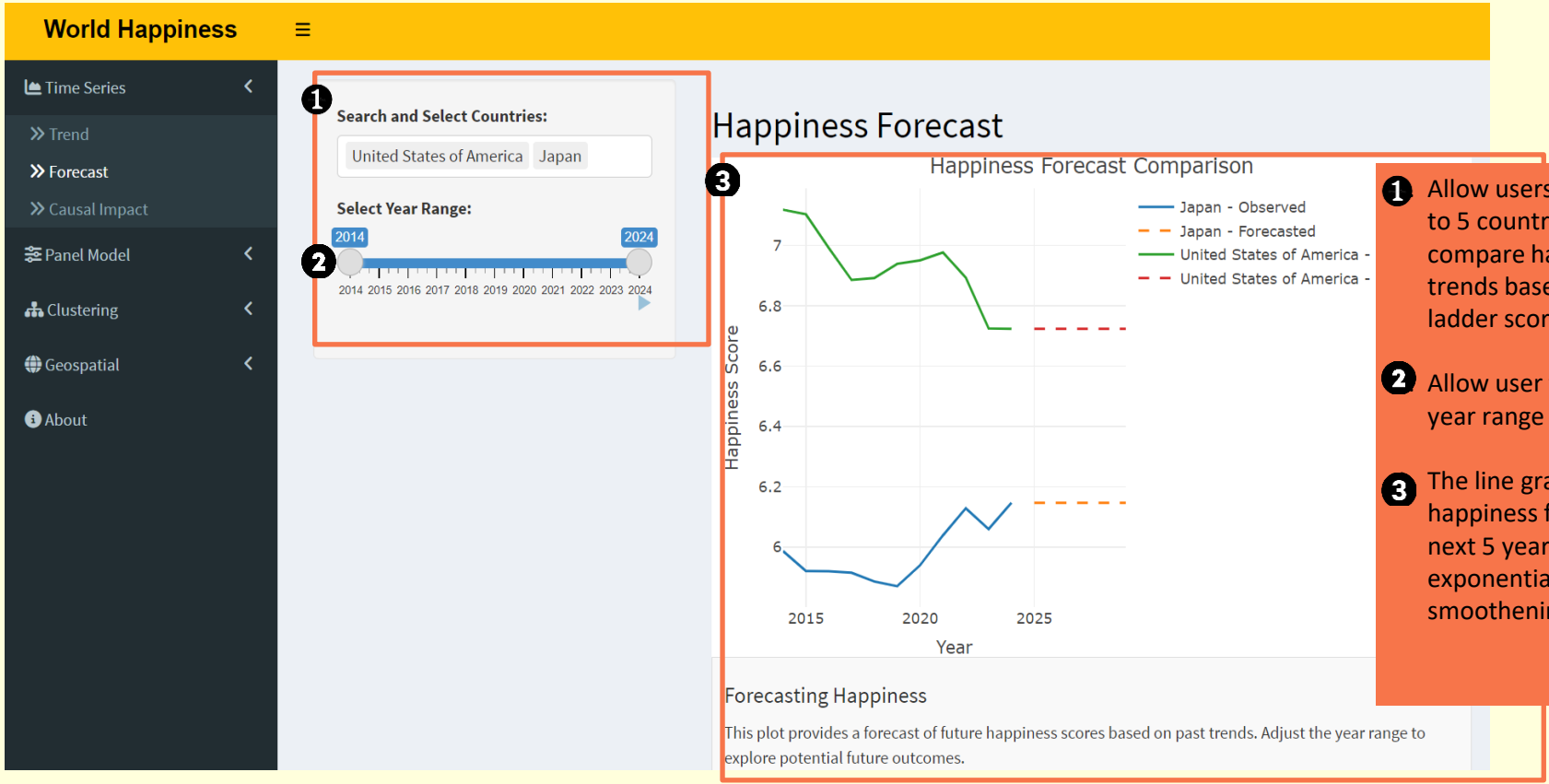
User Guide for Group 14

TIME SERIES: HAPPINESS TREND



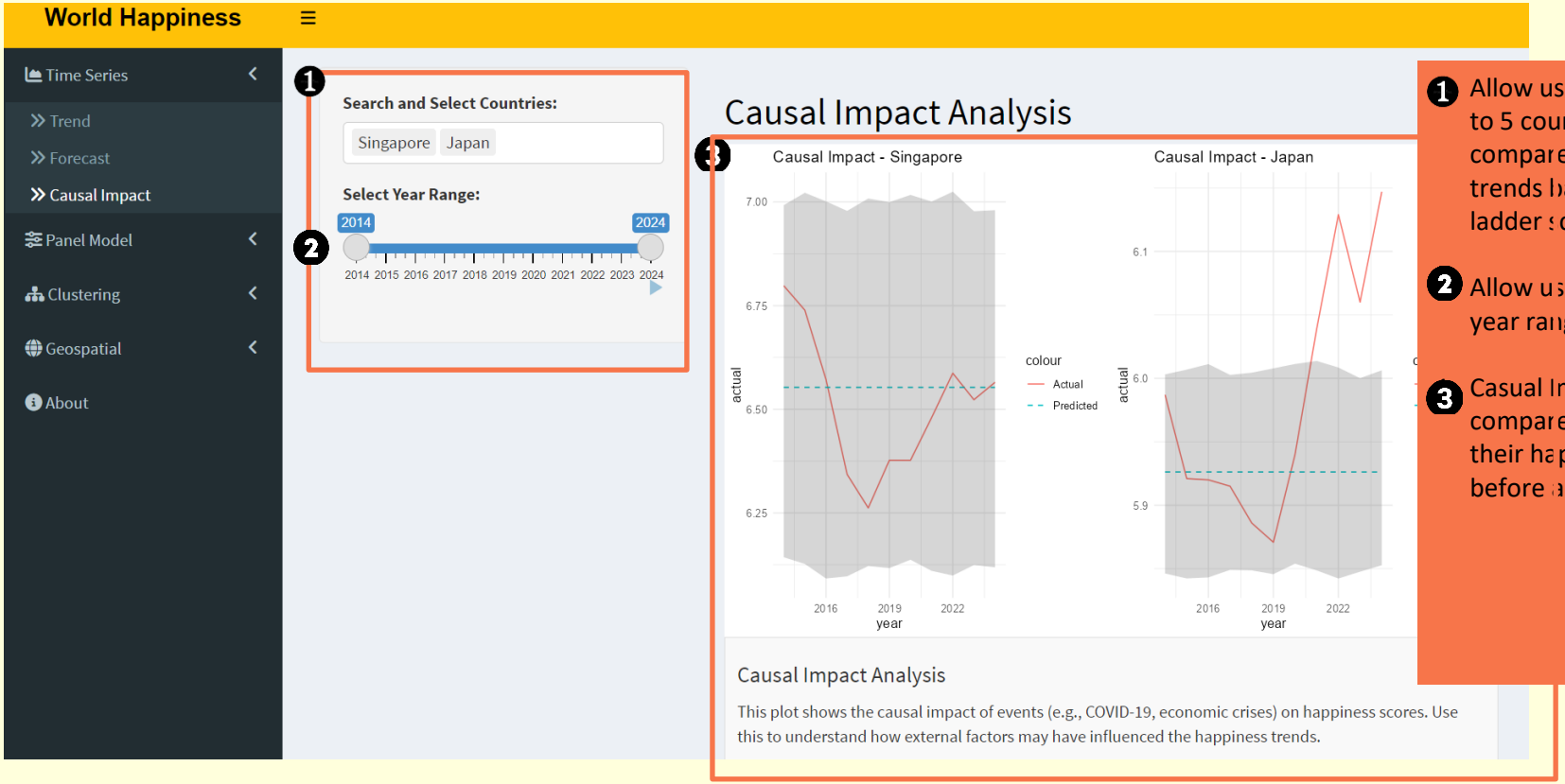
1. Allow users to select up to 5 countries to compare happiness trends based on the ladder score
2. Allow user to select the year range for the same
3. The line graph plot shows how the ladder score changes over the years among different countries

TIME SERIES: HAPPINESS FORECAST



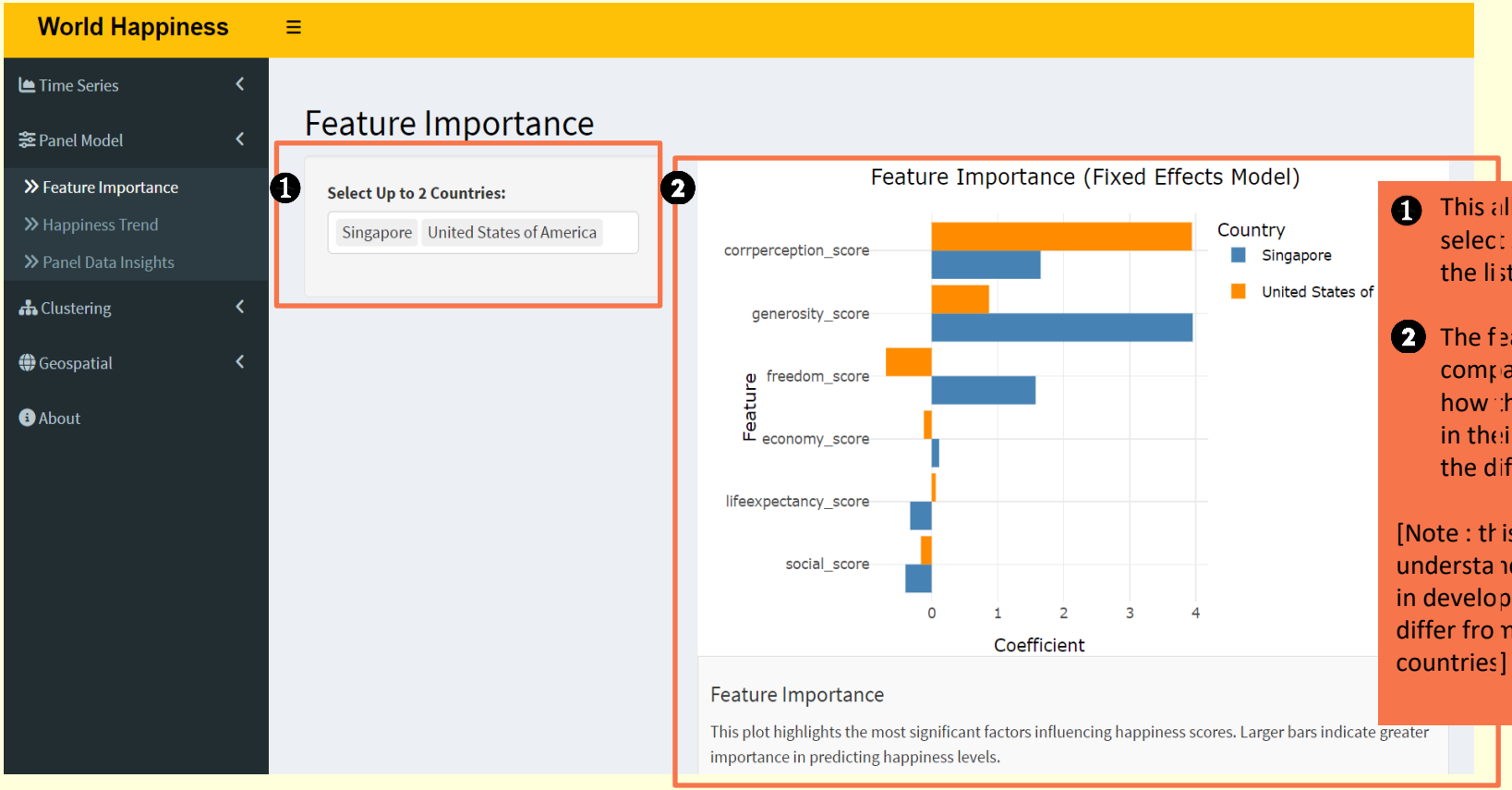
1. Allow users to select up to 5 countries to compare happiness trends based on the ladder score
2. Allow user to select the year range for the same
3. The line graph plots the happiness forecast for next 5 years using exponential smoothening.

TIME SERIES: COVID'19 HAPPINESS LEVELS



1. Allow users to select up to 5 countries to compare happiness trends based on the ladder score
2. Allow user to select the year range for the same
3. Casual Impact Plot compares countries and their happiness level before and after covid.

PANEL MODEL: FEATURE IMPORTANCE

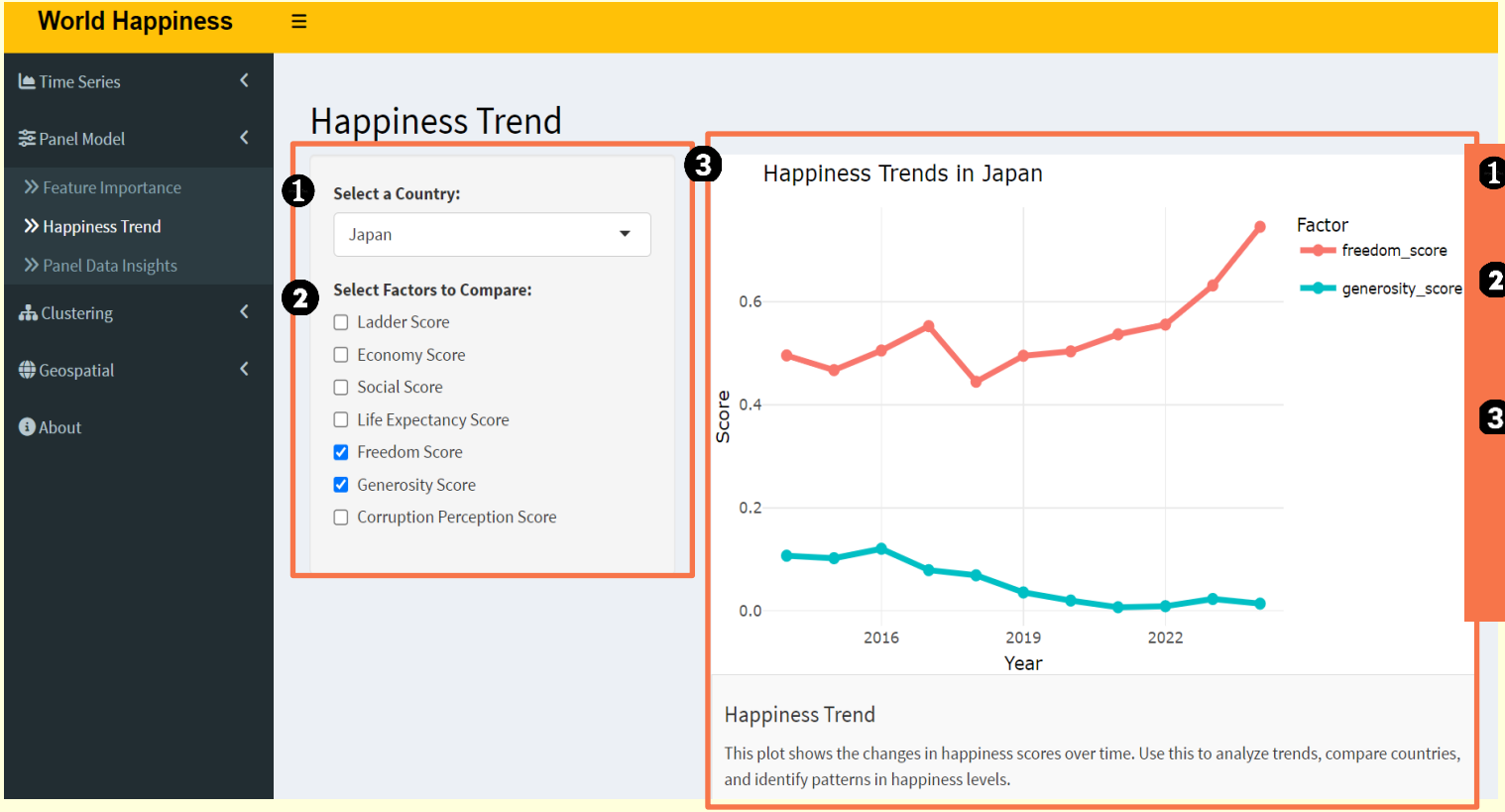


1. This allows users to select 2 countries from the list

2. The feature importance comparison plot, shows how the 2 countries vary in their scores based on the different factors.

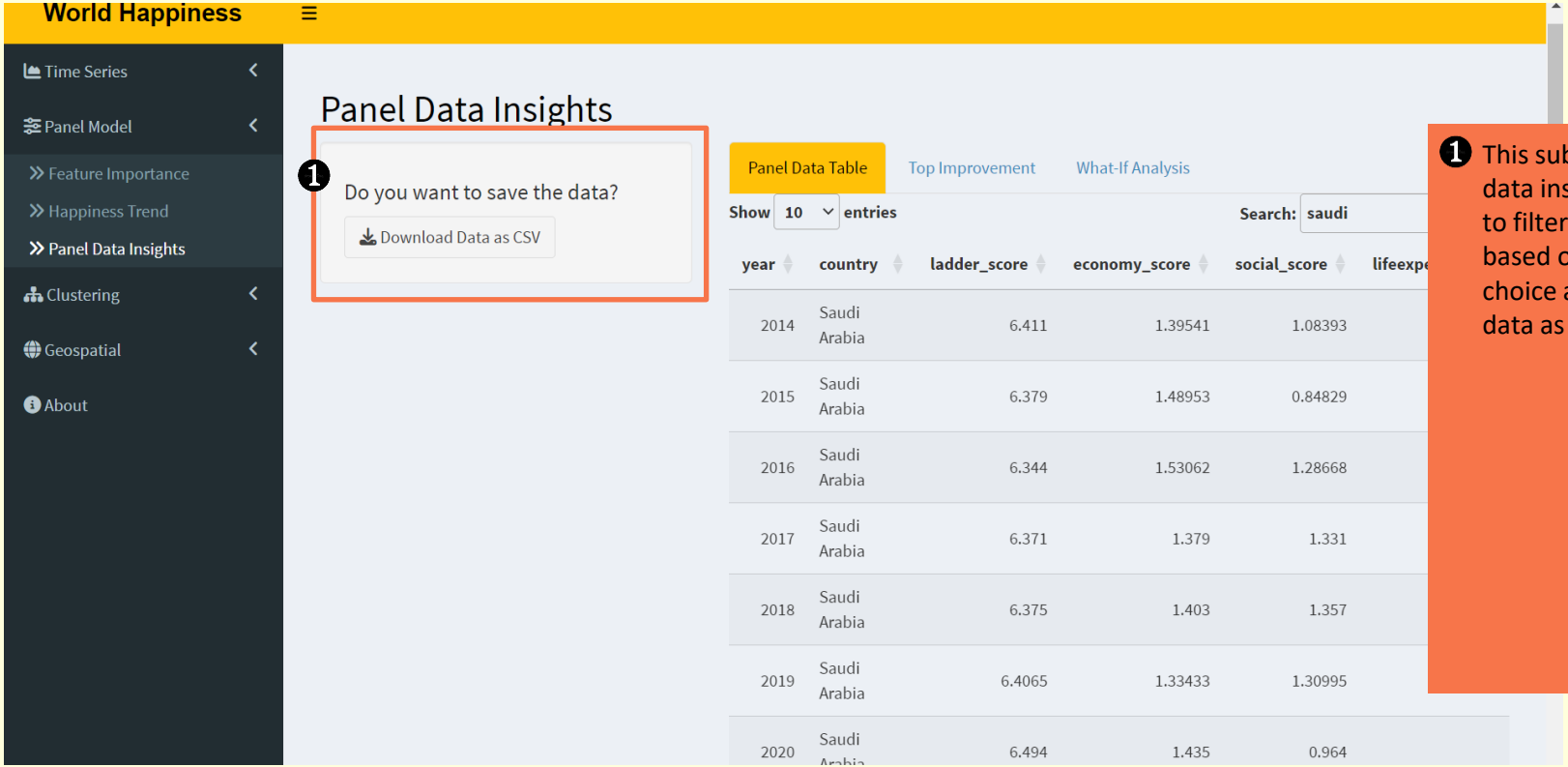
[Note : this helps understand how the factors in developing countries differ from developed countries]

PANEL MODEL: HAPPINESS TREND (using factor)



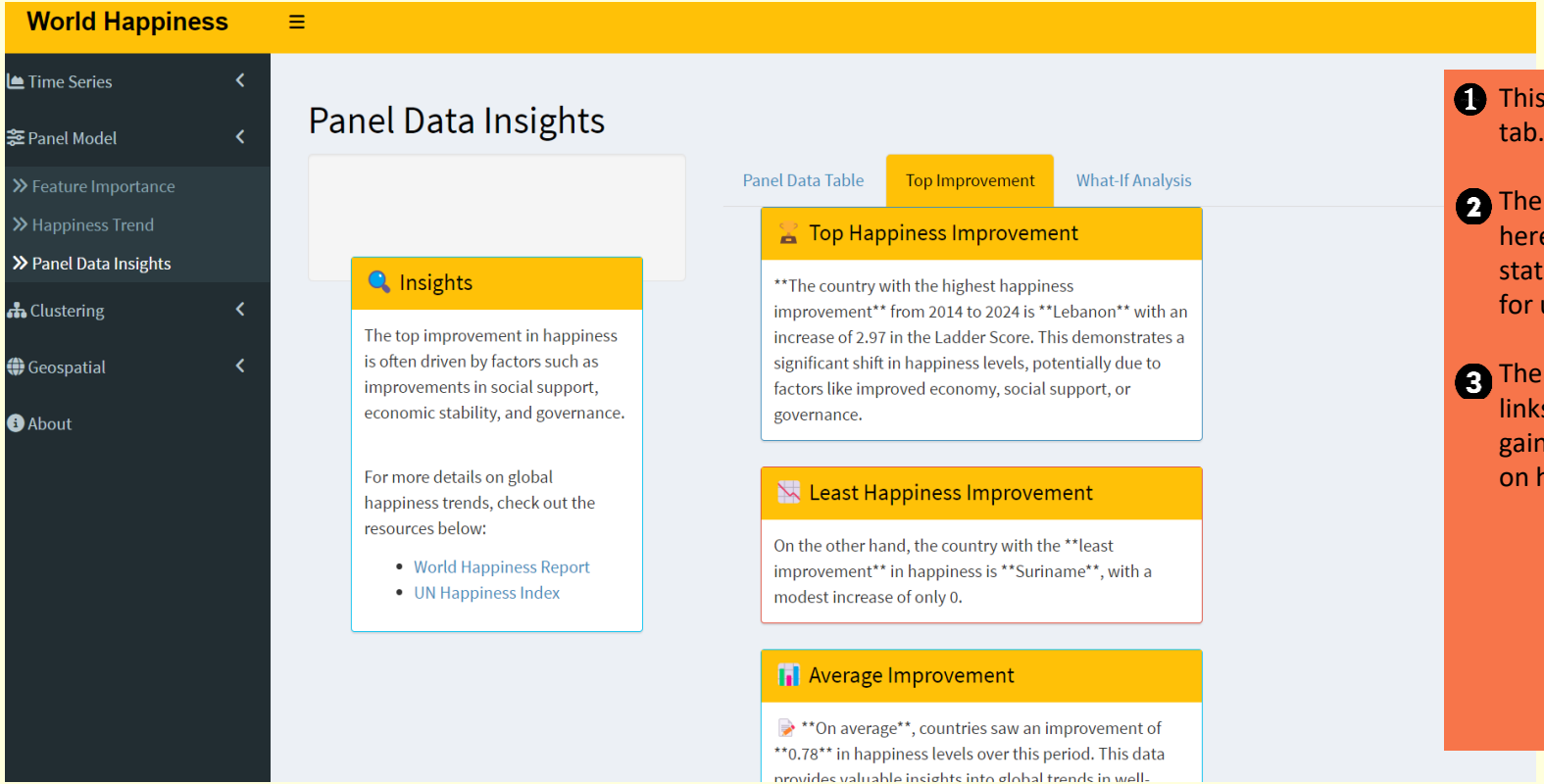
1. Allows user to select a country
2. Allows user to select at least 1 or more factors to compare
3. Allows user to compare different factors over time

PANEL MODEL: DATA TABLE



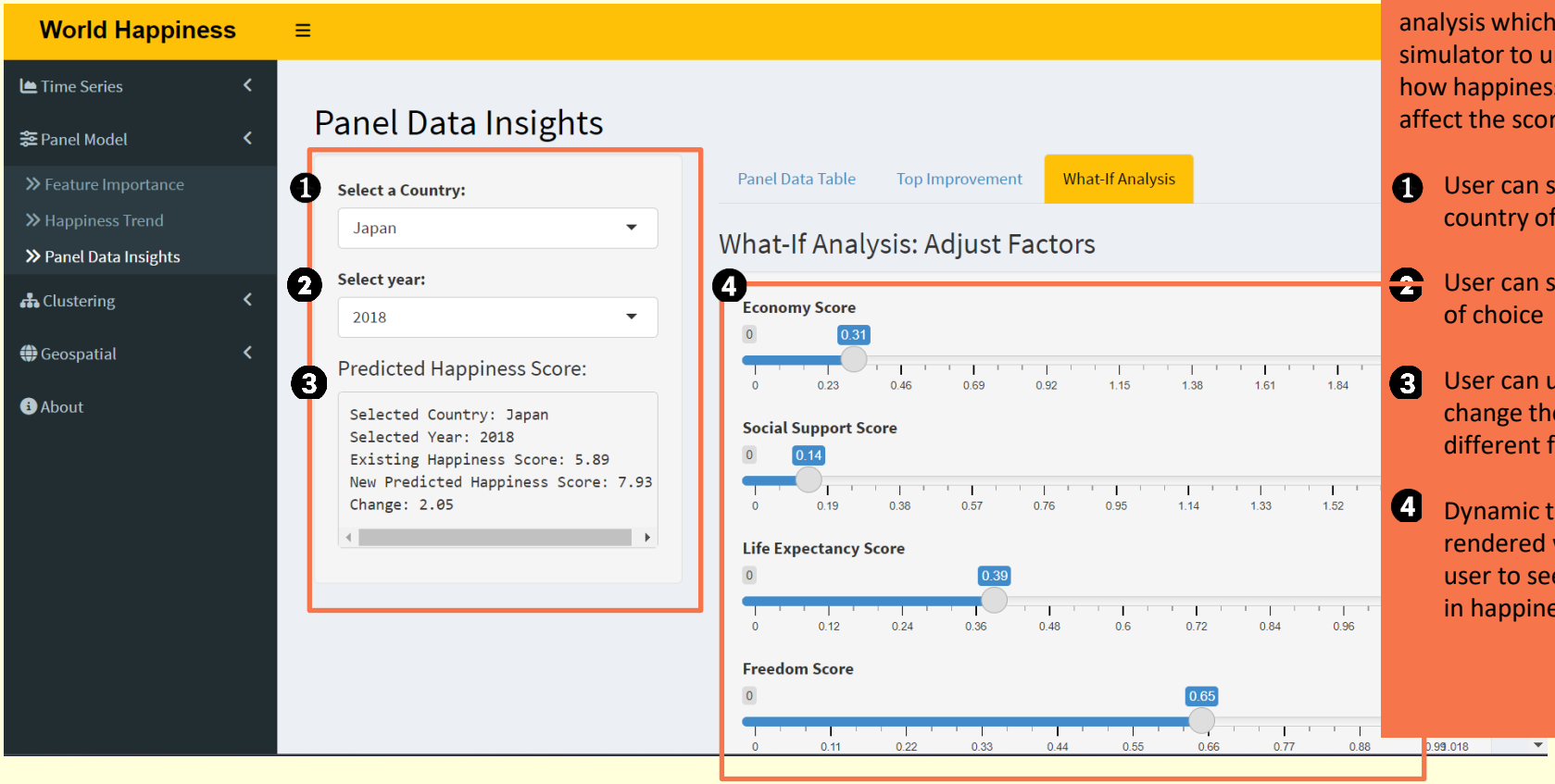
1. This sub tab under panel data insights allows user to filter the data table based on country of choice and save that data as a csv file

PANEL MODEL: DATA INSIGHTS



1. This is the insights sub tab.
2. There is no interactivity here, but important statistics are summarized for users.
3. There are also external links if the user wishes to gain more information on happiness data/index

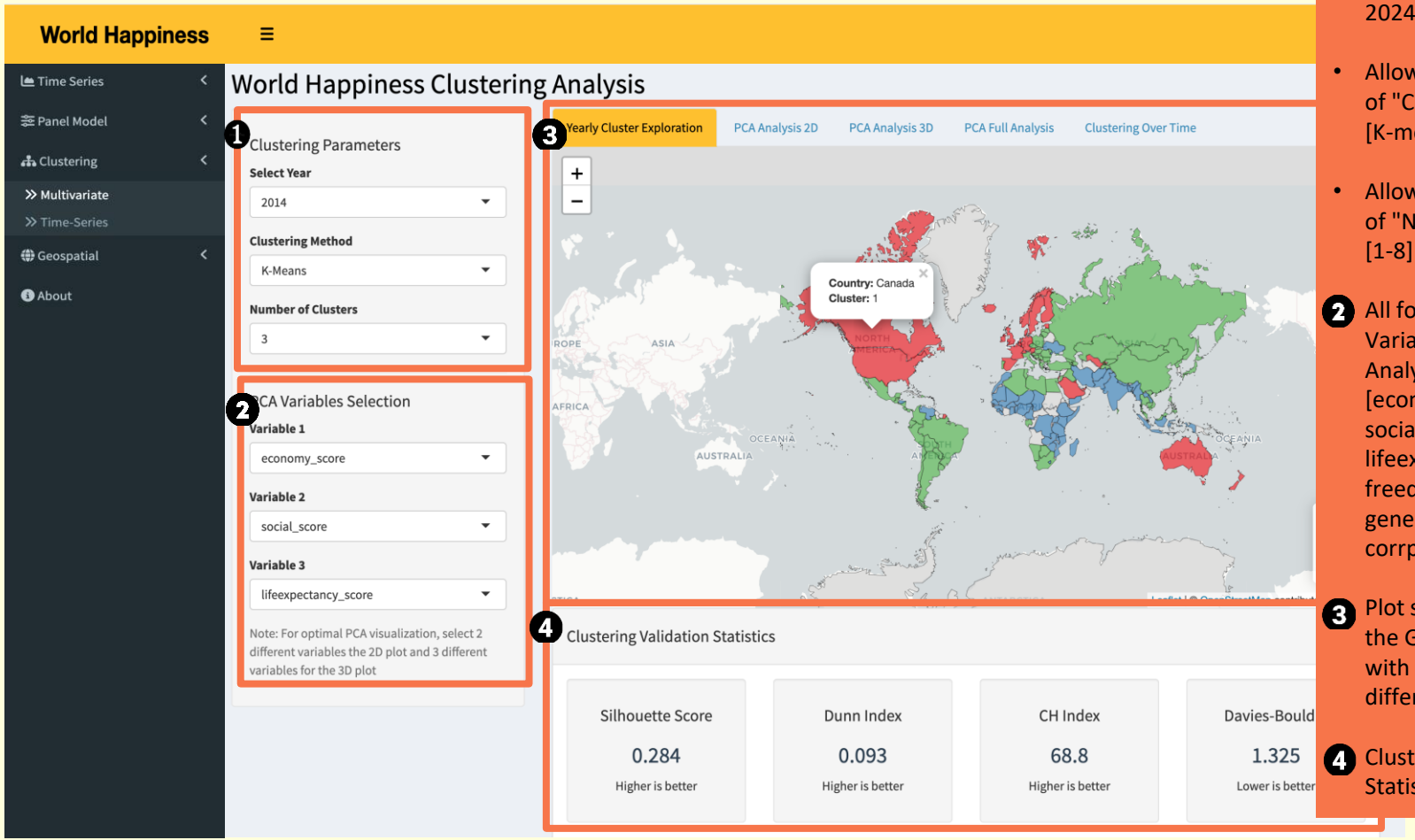
PANEL MODEL: WHAT IF ANALYSIS SIMULATOR



This sub tab is What-if analysis which is kind of a simulator to understand how happiness factors affect the score

1. User can select a country of choice
2. User can select a year of choice
3. User can update and change the value of the different factors
4. Dynamic text is rendered which allows user to see the change in happiness score.

CLUSTERING: YEARLY CLUSTER EXPLORATION



1. Allow for the selection of the "Year" [2014-2024]

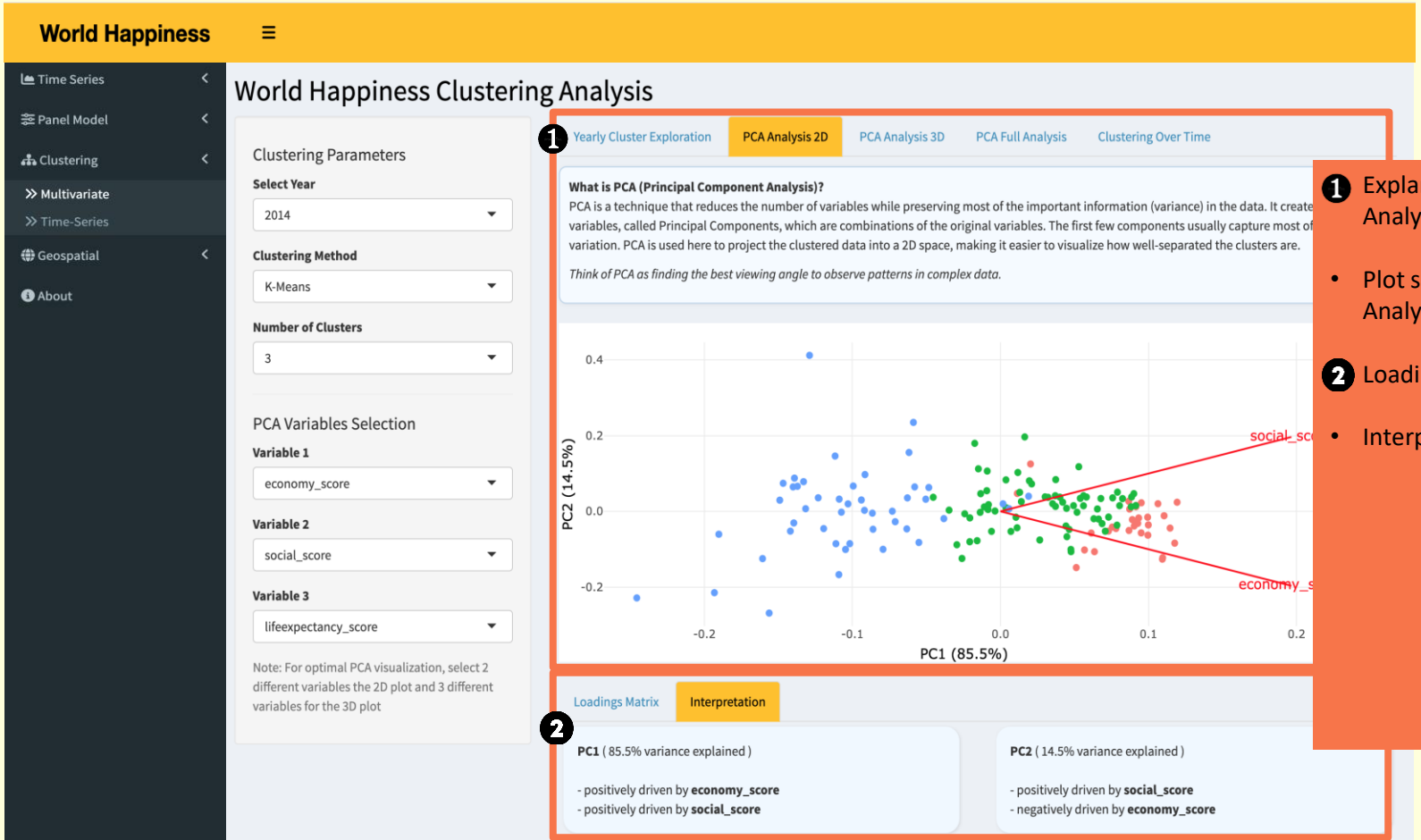
- Allow for the selection of "Clustering Method" [K-means, Hierarchical"]
- Allow for the selection of "Number of Clusters" [1-8]

2. All for selection of Variables for PCA Analysis [economy_score, social_score, lifeexpectancy_score, freedom_score, generosity_score, corrperception_score]

3. Plot showing the Geographical Map with different colors for different clusters

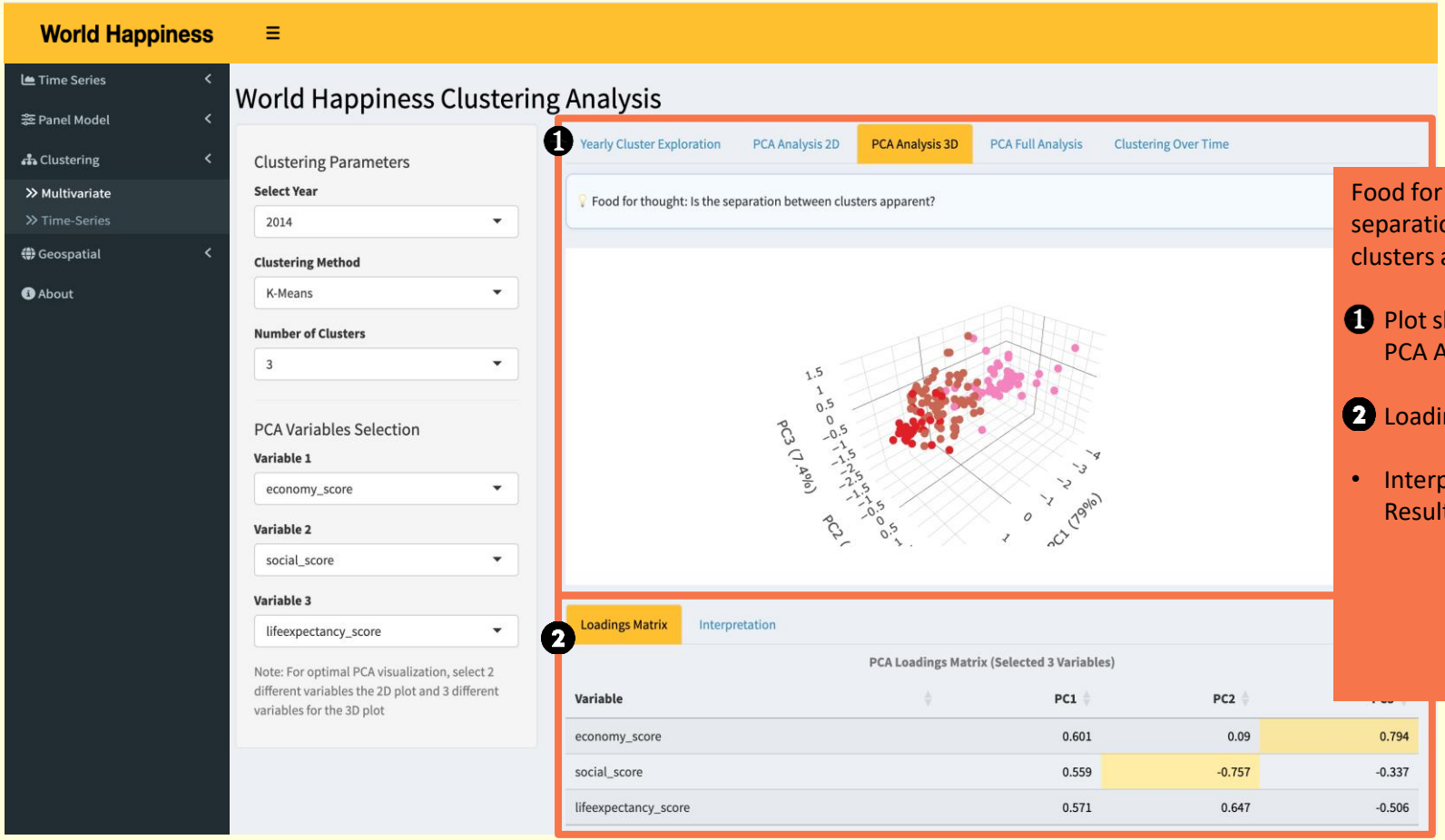
4. Clustering Validation Statistics

CLUSTERING: PCA ANALYSIS 2D



1. Explanation of PCA Analysis
   - Plot showing the 2D PCA Analysis
2. Loading Matrix
   - Interpretation of results

CLUSTERING: PCA ANALYSIS 3D

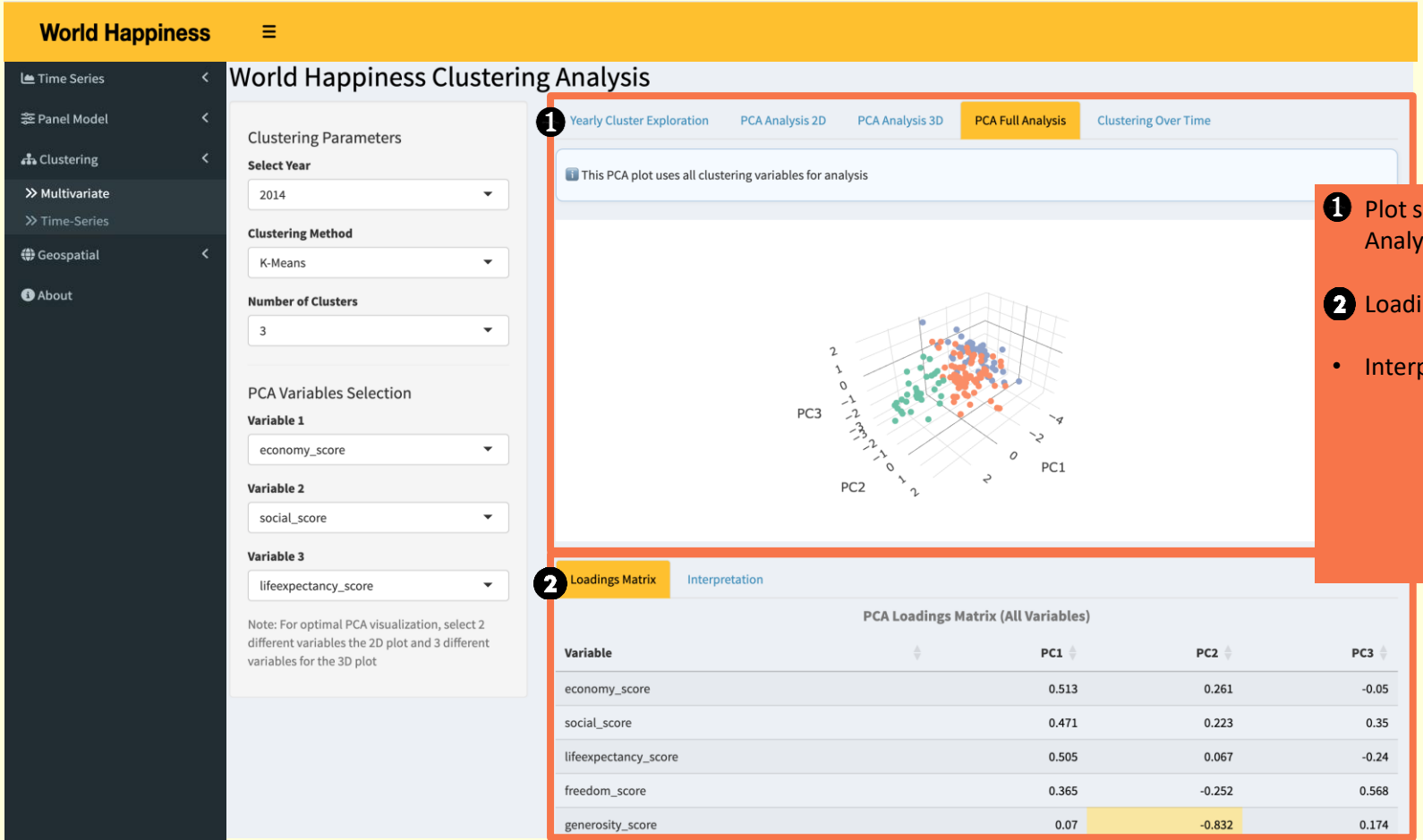


Food for Thought – Is the separation between clusters approved?

1. Plot showing the 3D PCA Analysis
2. Loading Matrix

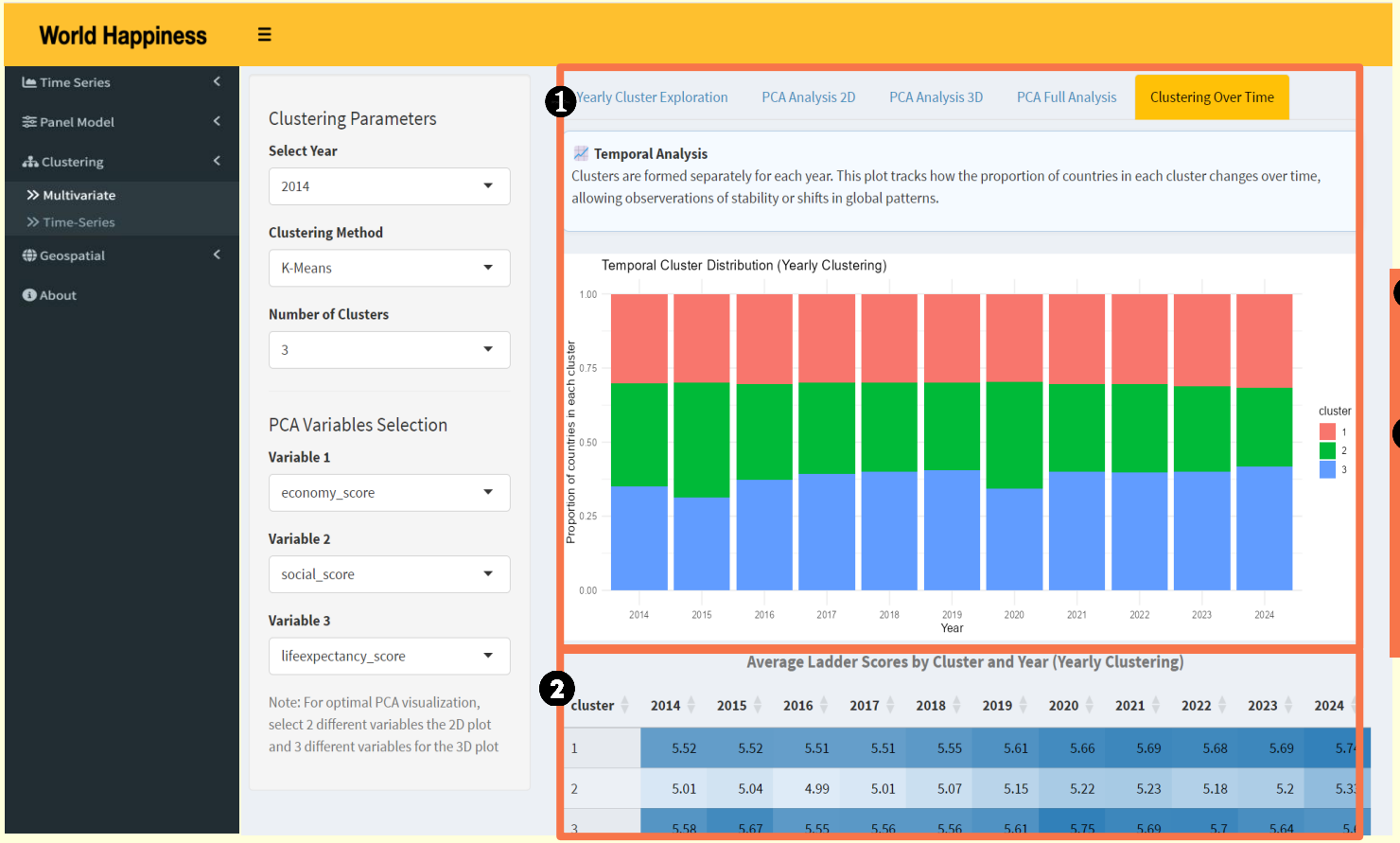
- Interpretation of Results

CLUSTERING: PCA FULL ANALYSIS



1. Plot showing the 3D PCA Analysis
2. Loading Matrix
   - Interpretation of Results

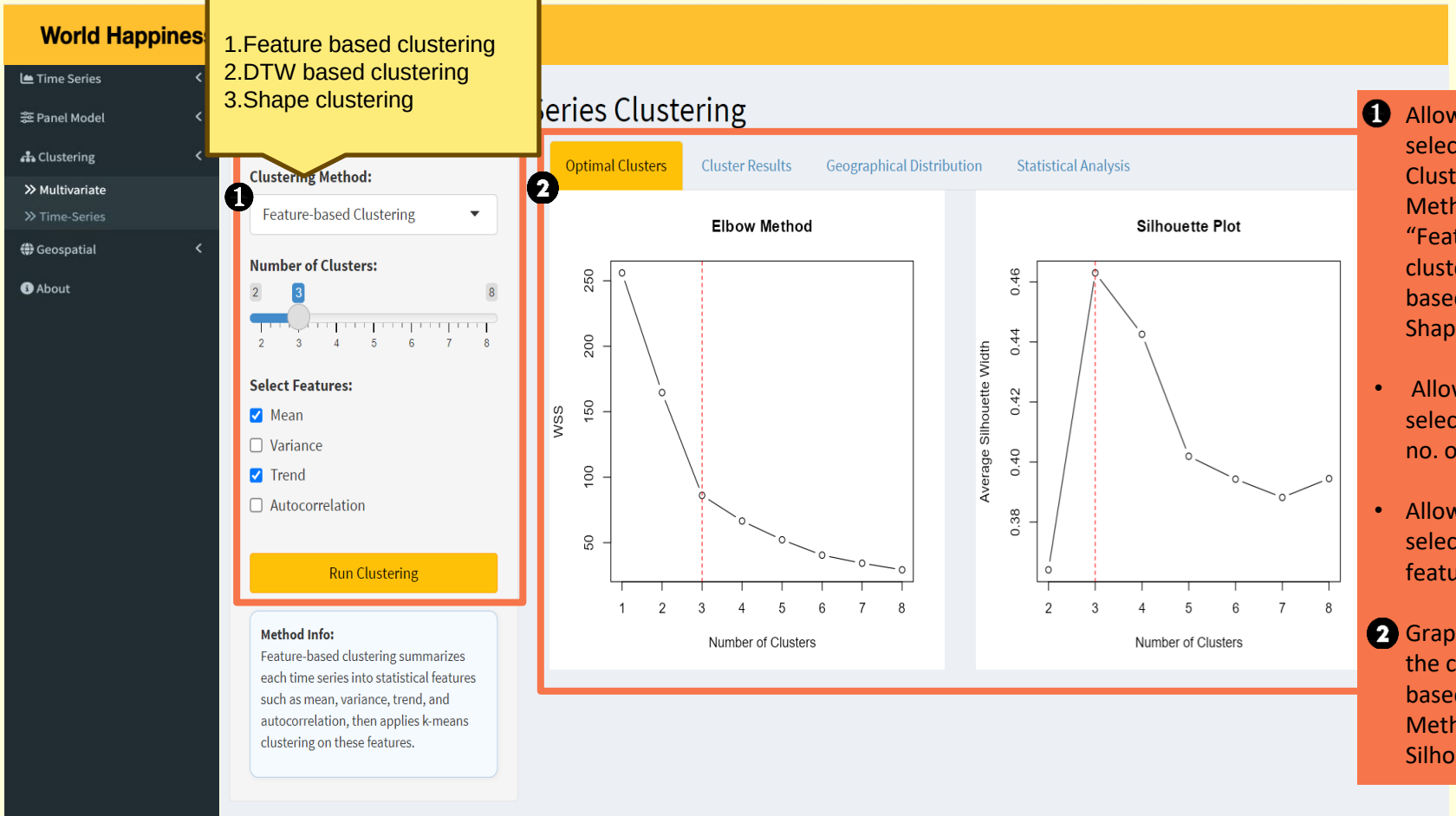
CLUSTERING: CLUSTERING OVER TIME



1. 100% Stacked Bar Plot showing the Temporal Cluster Distribution
2. Clustering Statistics by Year (ladder score)

CLUSTERING: OPTIMAL CLUSTERS

1.Feature based clustering
2.DTW based clustering
3.Shape clustering

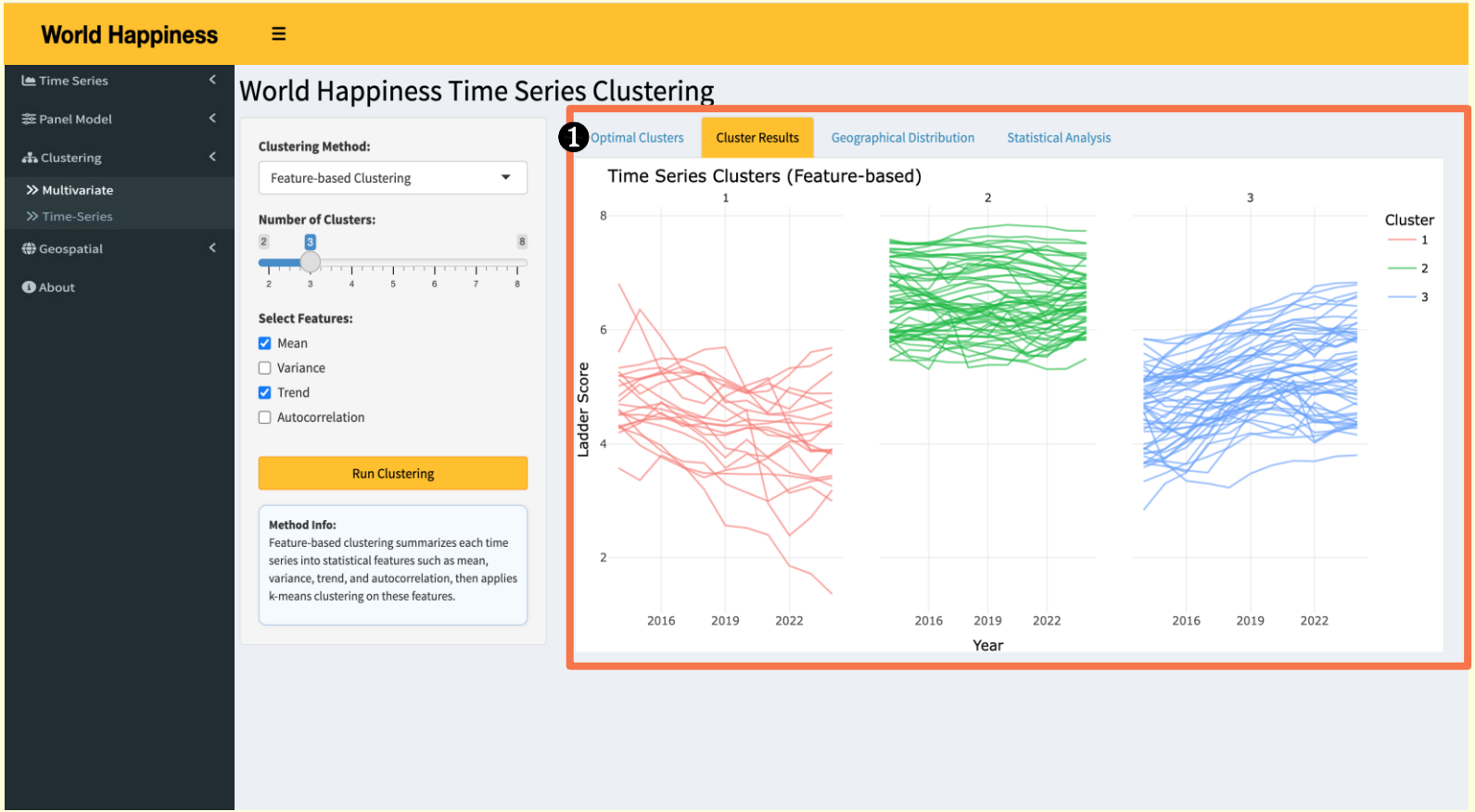


1. Allow for the selection of the Clustering Method – "Feature-based clustering, DTW-based clustering, Shape clustering"

- Allow for the selection of the no. of clusters
- Allow for the selection of the features.

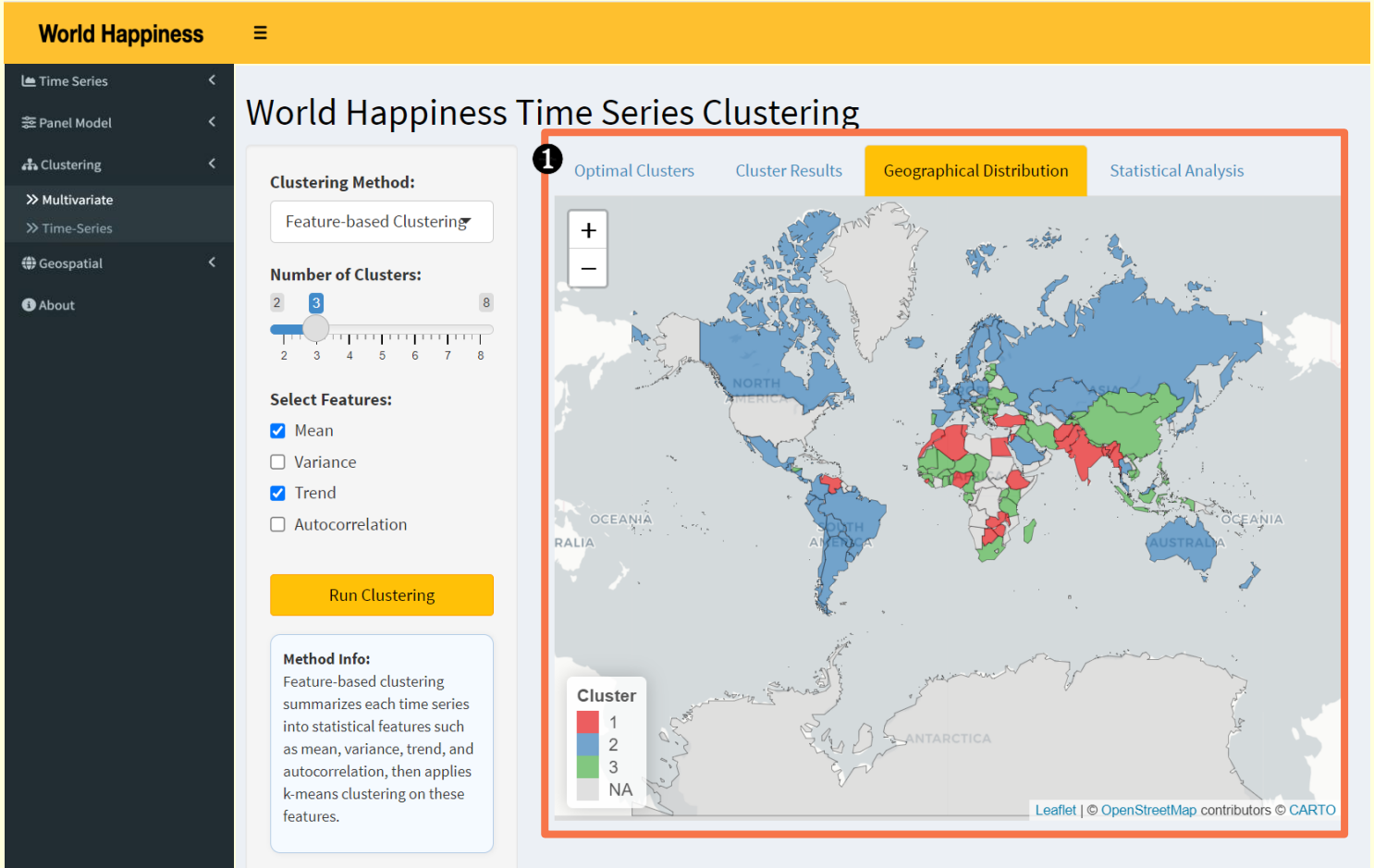
2. Graph showing the clusters based on Elbow Method/ Silhouette Plot

CLUSTERING: CLUSTER RESULTS



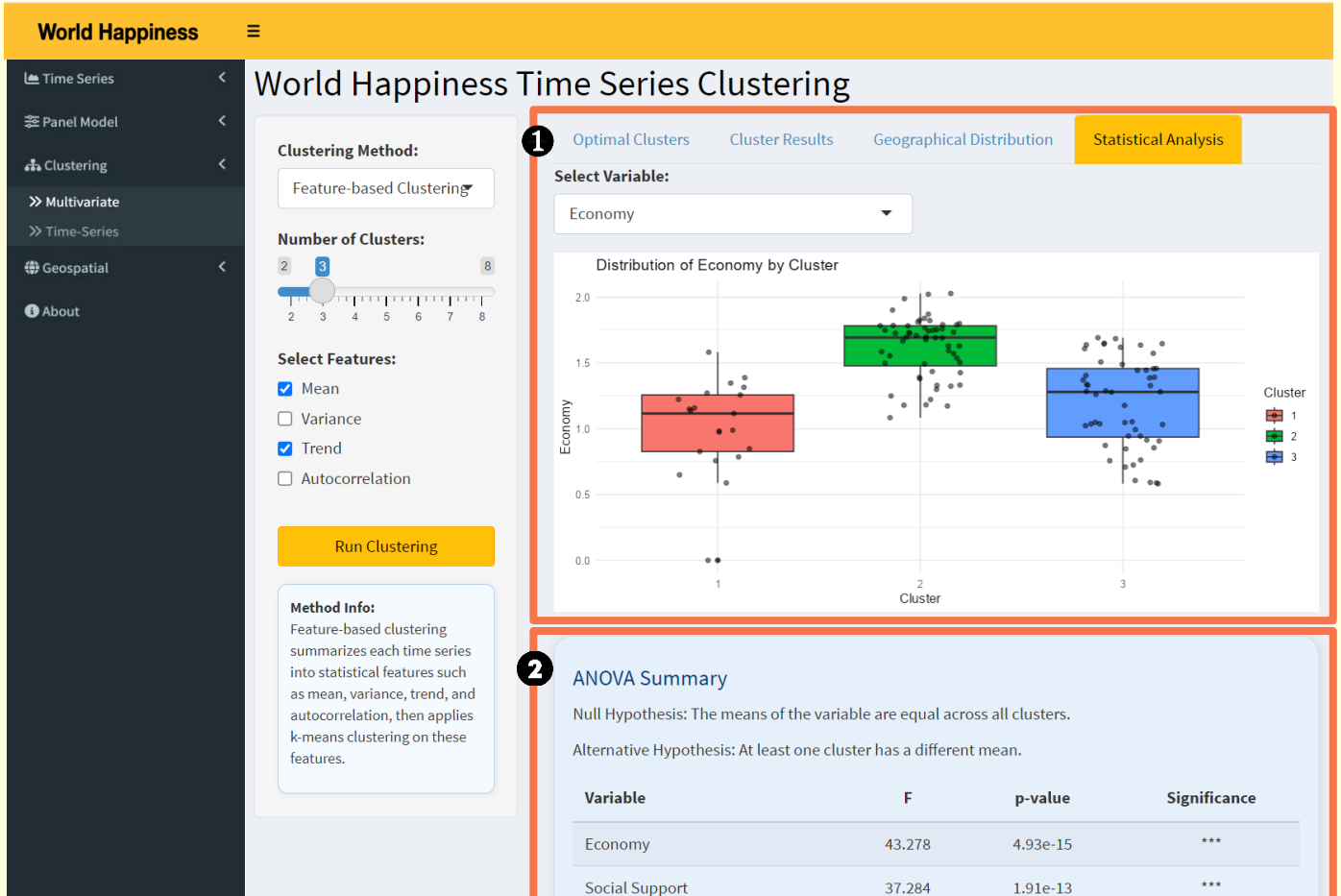
1 The line graph plots the ladder score for all the years for visual comparison of the different clusters.

CLUSTERING: GEOGRAPHICAL DISTRIBUTION



1 Plot showing the countries by clusters based on the selection of the users

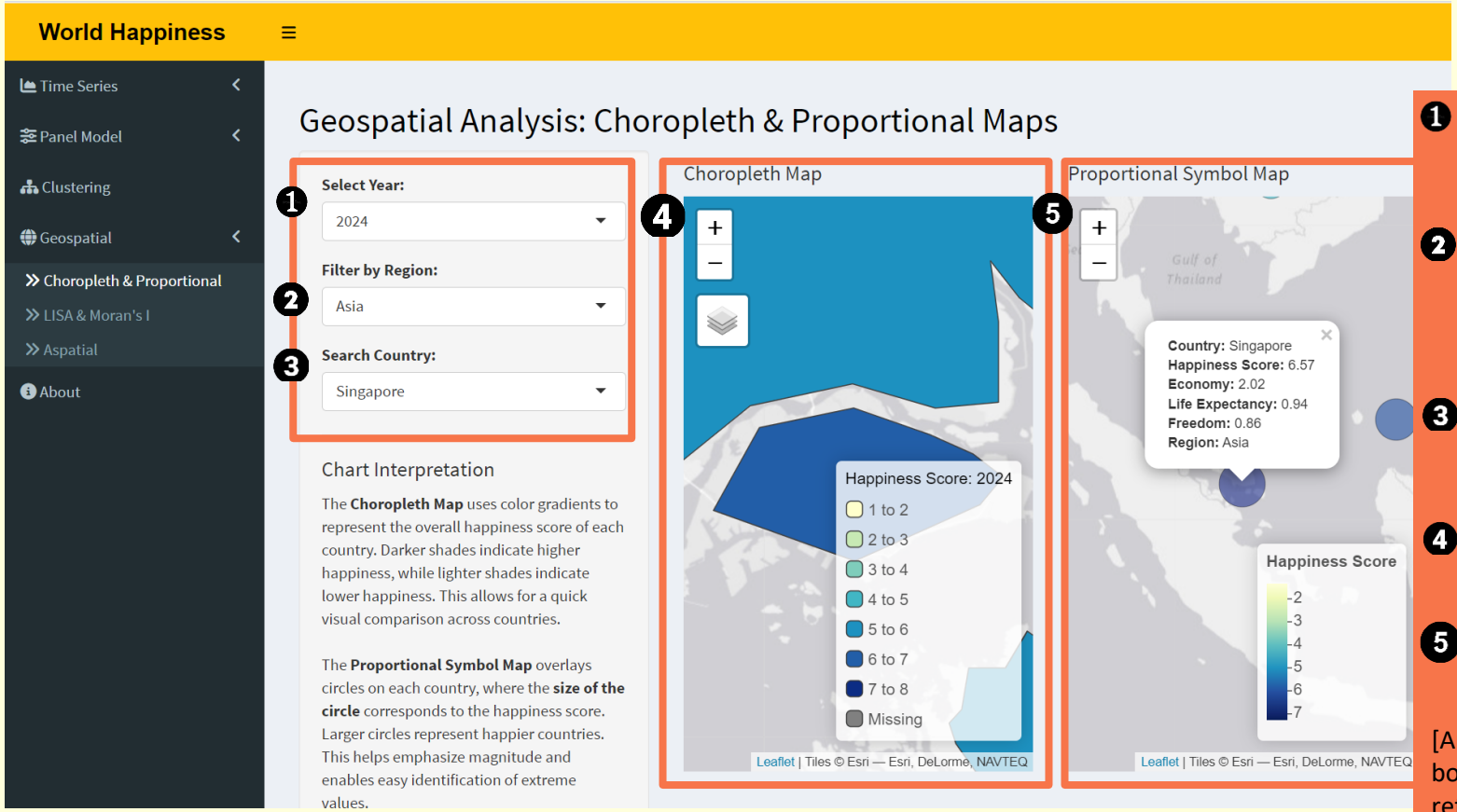
CLUSTERING: STATISTICAL ANALYSIS



1. Boxplots showing the statistics of the different clusters based on the user's selection

2. ANNOVA Test Result Summary at a glance

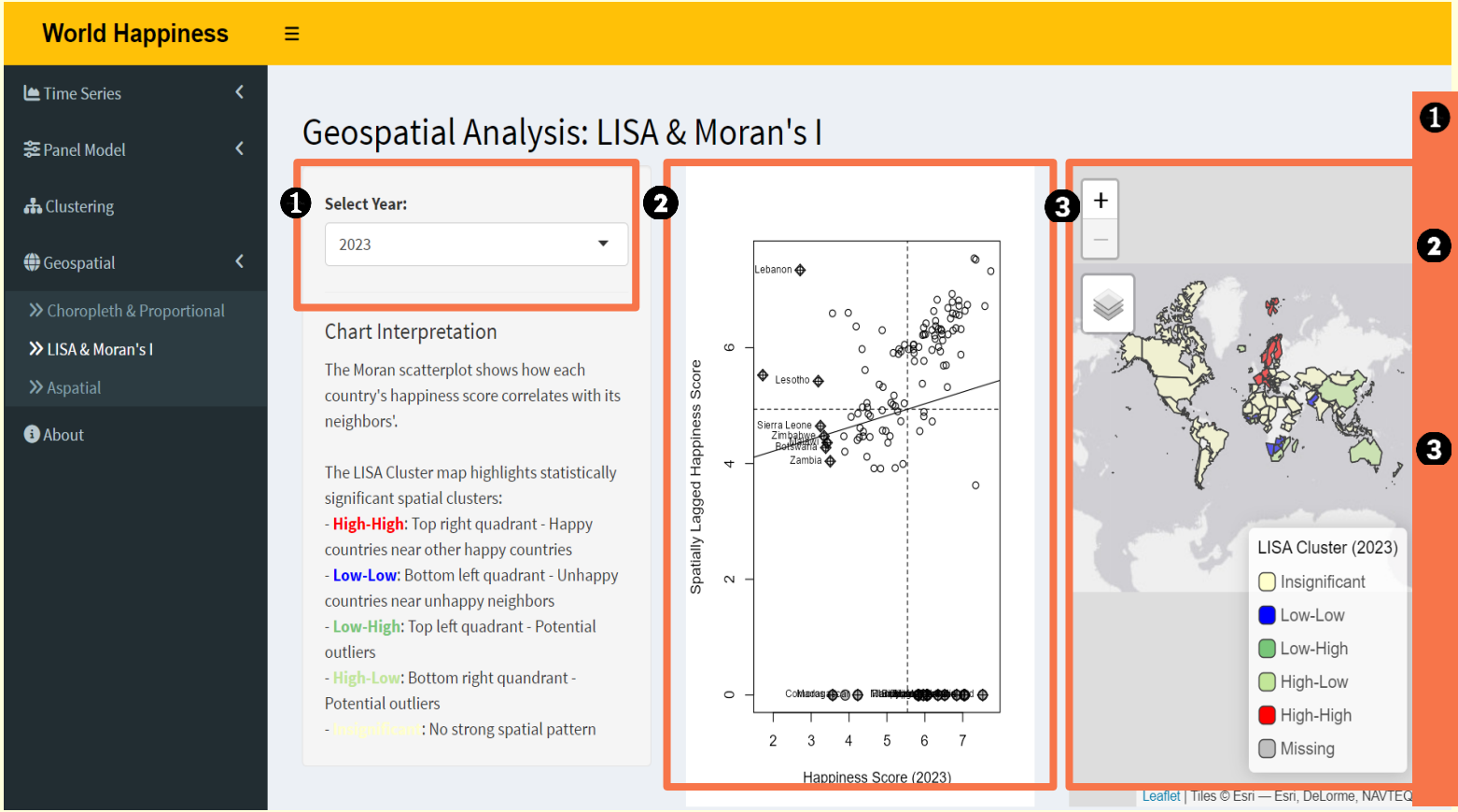
GEOSPATIAL ANALYSIS: CHOROPLETH & PROPORTIONAL MAPS



1. Allow for the selection of the “Year” [2014 to 2024]
2. Allow for the selection of “Region” [All, Africa, Americas, Asia, Europe, Oceania]
3. Allow for selection of “Country” [173 countries]
4. Plot showing the Choropleth Map
5. Plot showing the proportional symbol map

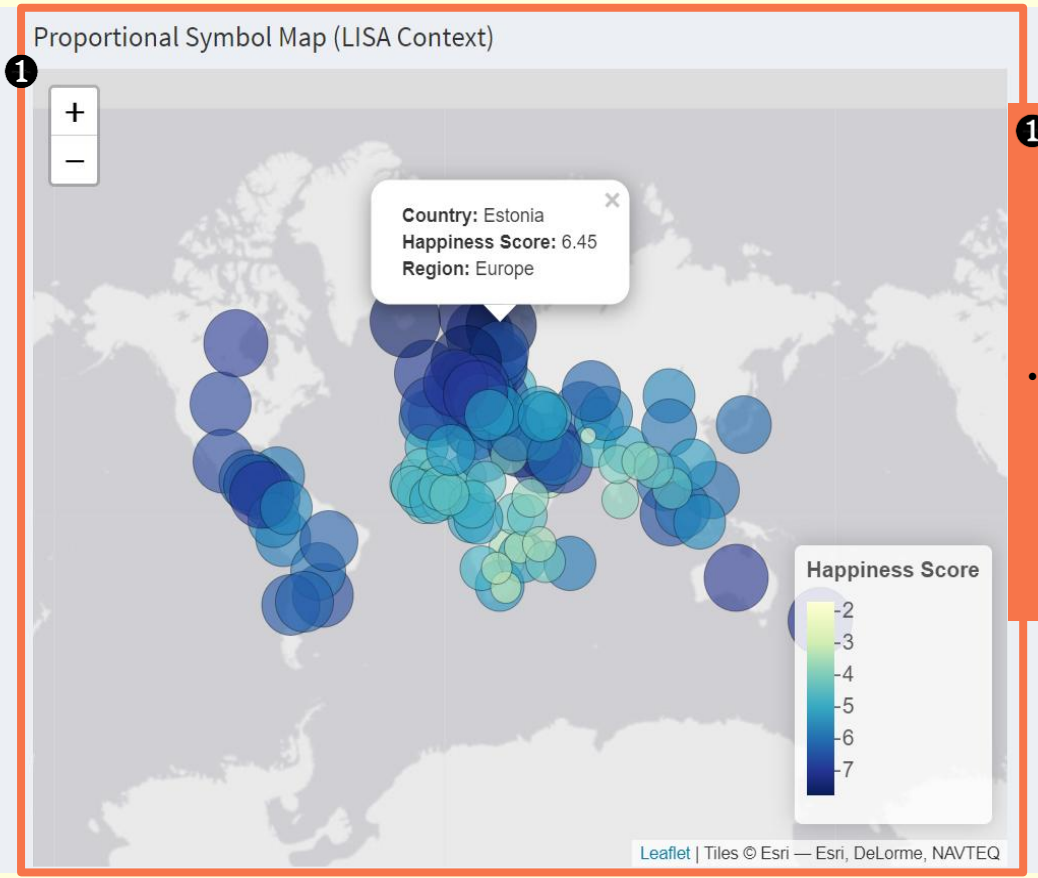
[Auto-zoom in features for both maps to allow for easy referencing]

GEOSPATIAL ANALYSIS: LISA & MORAN'S I



1. Allow for the selection of the "Year" [2014 to 2024]
2. Moran scatterplot – shows the spatial lag of happiness score (y axis) against country's own happiness score (x axis)
3. LISA cluster map – highlights the statistically significant spatial clusters based on local spatial autocorrelation with neighbouring nations.

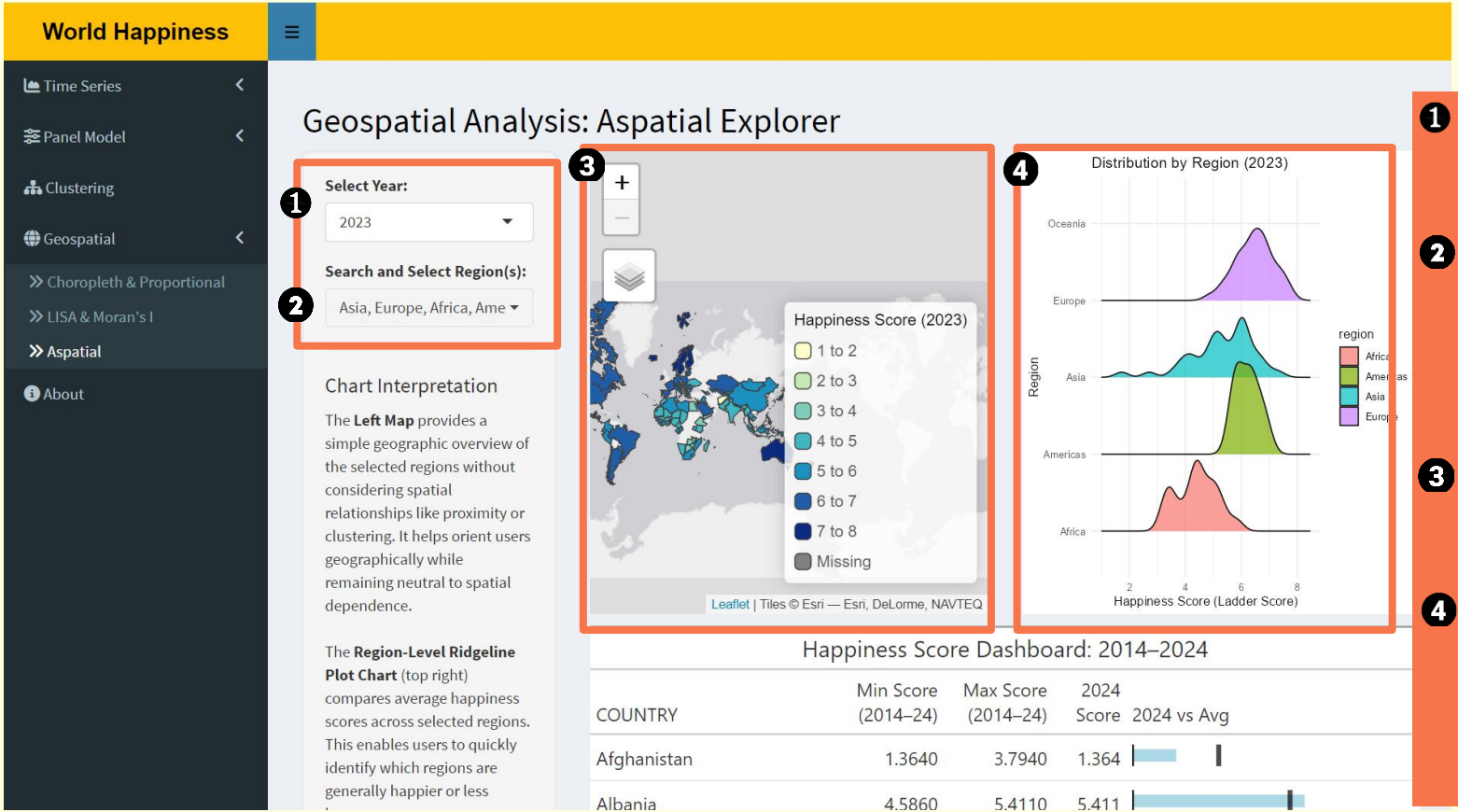
GEOSPATIAL ANALYSIS: LISA & MORAN'S I



1. Proportional symbol map provides an intuitive overview of each country's happiness score using bubble size and color.

- Visually confirms patterns observed in the Moran scatterplot and LISA cluster map.

GEOSPATIAL ANALYSIS: ASPATIAL EXPLORER



1. Allow for the selection of the "Year" [2014 to 2024]
2. Allow for multiple filtering by region (e.g.: Asia, Europe, Africa etc.) to compare and explore regional happiness trends.
3. Visualizes each country's happiness score using bubble size and color.
4. Displays the distribution of happiness scores by region using region-wise ridgeline plot.

GEOSPATIAL ANALYSIS: ASPATIAL EXPLORER

❶ The **Region-Level Ridgeline Plot Chart** (top right) compares average happiness scores across selected regions. This enables users to quickly identify which regions are generally happier or less happy.

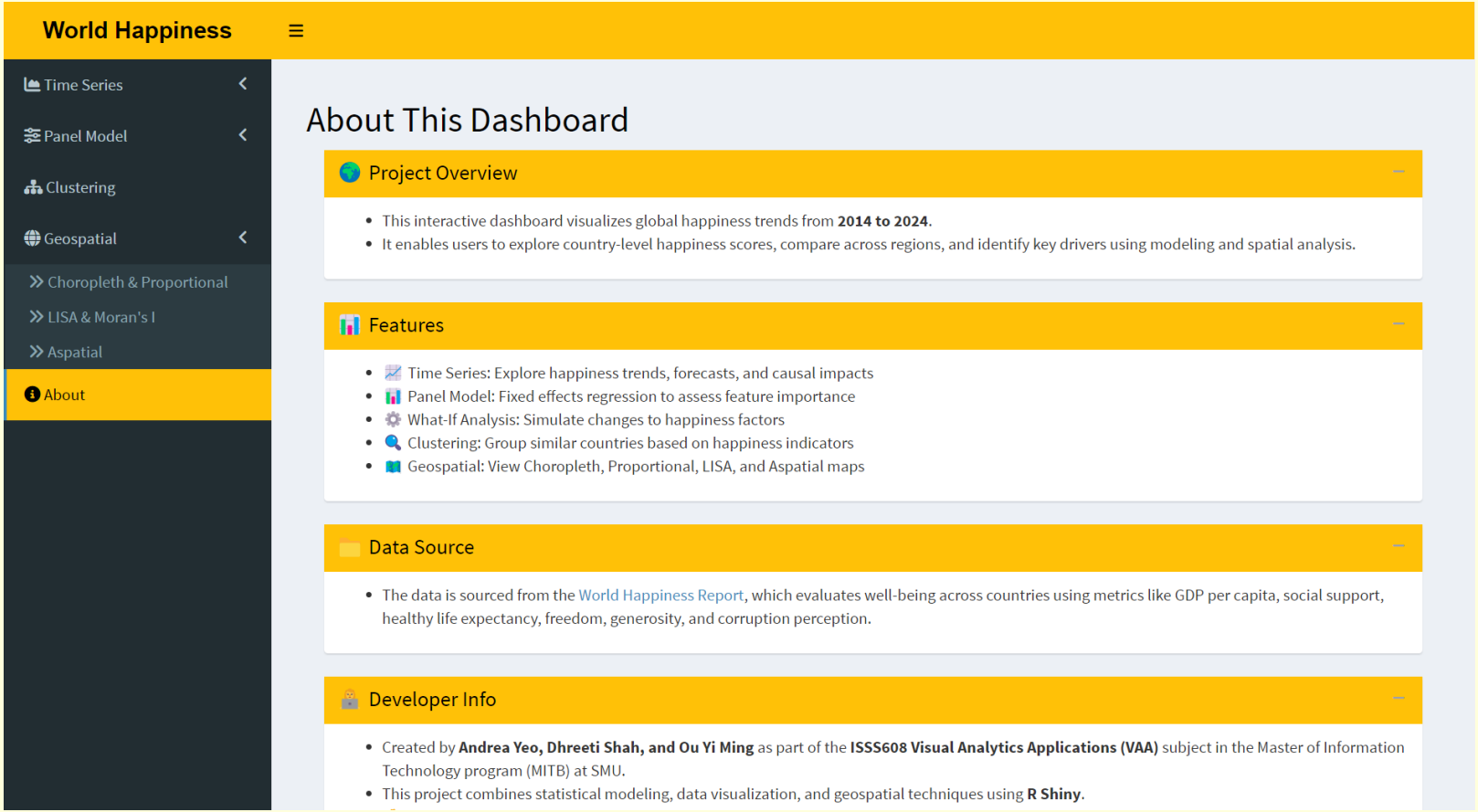
The **Summary Table** complements the visuals by providing exact happiness values, averages, and rankings, allowing for precise data inspection.

Happiness Score Dashboard: 2014–2024

COUNTRY	Min Score (2014–24)	Max Score (2014–24)	2024 Score	2024 vs Avg
Afghanistan	1.3640	3.7940	1.364	
Albania	4.5860	5.4110	5.411	
Algeria	4.8870	6.3550	5.571	
Angola	3.7950	4.0330	NA	
Argentina	5.9290	6.6500	6.397	
Armenia	4.3210	5.4940	5.494	
Australia	6.9740	7.3130	6.974	
Austria	6.8100	7.2942	6.810	
Azerbaijan	4.8750	5.2910	4.875	
Bahrain	5.9590	6.6470	6.030	
Bangladesh	3.8510	5.1550	3.851	
Belarus	5.3230	5.8210	NA	
Belgium	6.8050	6.9370	6.910	
Belize	5.9560	6.7110	6.711	
Benin	3.3400	5.2160	4.357	

❶ Summary table that provides detailed happiness statistics (min, max, average, 2024 score) for each country to support precise comparisions.

ABOUT:


World Happiness
Time Series
Panel Model
Clustering
Geospatial
Choropleth & Proportional
LISA & Moran's I
Aspatial
About
About This Dashboard
Project Overview
This interactive dashboard visualizes global happiness trends from 2014 to 2024.
It enables users to explore country-level happiness scores, compare across regions, and identify key drivers using modeling and spatial analysis.
Features
Time Series: Explore happiness trends, forecasts, and causal impacts
Panel Model: Fixed effects regression to assess feature importance
What-If Analysis: Simulate changes to happiness factors
Clustering: Group similar countries based on happiness indicators
Geospatial: View Choropleth, Proportional, LISA, and Aspatial maps
Data Source
The data is sourced from the World Happiness Report, which evaluates well-being across countries using metrics like GDP per capita, social support, healthy life expectancy, freedom, generosity, and corruption perception.
Developer Info
Created by Andrea Yeo, Dhreeti Shah, and Ou Yi Ming as part of the ISSS608 Visual Analytics Applications (VAA) subject in the Master of Information Technology program (MITB) at SMU.
This project combines statistical modeling, data visualization, and geospatial techniques using R Shiny.

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