Data Visualization Project

A Visual Narrative on the status of trade across modern global economies

Messaging

Context

Trade is an essential part of of every nation’s economy. However, every country partakes in this differently on the global stage.

Goal

This Visual Narrative aims to analyze how various countries approach global trade by looking at a few key indicators.

Technique

The content is broken down into 3 slides. Each slide is a scene that represents a unique way of viewing and understanding international trade.

The narrative allows for the audience to identify broad patterns in data (eg. Most African countries have a trade deficit) while also allowing them to deep dive into the specifics of countries they may be interested in (eg. Indonesia is a net exporter in the global market and has increased the amount they trade by ~9% points in the past 40 odd years).

Narrative Structure

Structure Used

This Narrative Visualization follows the “**interactive slide show**” format.
This provides a hybrid structure of viewing for the audience where I, the author, have curated a linear predefined path highlighting a high level story, but allowing the user free form access within the bounds of each scene.

Explanation

There are three scenes in total with the viewer starting at the first.
The viewer progressively moves from the first scene to the second and then the third.
At each scene, the user is provided with a narrative and then is allowed to deep dive into data relevant to that scene and that scene alone.

Visual Structure

All three slides of this visual narrative have the **same visual structure for consistency**. This simplifies the experience for the viewer making it easier to understand the contents of the scenes.

Structure in each scene

Each scene has the same 5 core components:

1. **Slide controls/Triggers**: This allows the viewer to progress from one scene to the next.
2. **Narrative Text**: This text contains the author's story for the scene being visualized.
3. **Map**: The data is represented by a map of the world
    1. The map is a choropleth where colours are representative of the data.
    2. The map has annotations that change based on the scene depending on the data.
    3. The map has a reset option for the user to zoom out if needed.
    4. The map allows the user to pick a country to gain more insights on the data.
4. **Country Details**: This component displays selected country data when available. If nothing has been selected, it provides an affordance to the user hinting to select a country.
5. **Hint**: This text provides clarifications on the data being displayed to assist the viewer.

How does it help the user understand and navigate?

The Slide controls are placed at the very top making it the first thing the user sees.
This **immediately informs the user on how to progress** in the narrative.

The Narrative Text helps inform the **user understand in short sentences what the data is about**.

The Map is designed as a choropleth with **annotations** that help the user **understand the colour code being used** along with a quick view of the countries that are at the extremities.

The Reset button along with the annotations provides **affordances to the user suggesting they click into a country to deep dive**. The text content below it also prompts the user to click into a country of their choice.

The **Hint finally provides added clarity** into the data being displayed. It poses as a mini-FAQ.

How does it highlight to focus on the key parts of the data?

The Map is placed centrally and **visually takes up the majority of the real estate**. This immediately points the user towards the visual they are going to interact with.

The annotations **point to the extremities** in each scene allowing
1) the user to calibrate to the choropleth's colour scheme.
2) suggesting the user can click into countries as more data is available.

The reset button **suggests that the map may be interacted with**, suggesting clicking into the data.

Finally, the suggestive text both above and below the map **directly suggest the user to interact** with the data available in the map.

How does it help the user transition scenes?

The **first interactive element on the page** are buttons that explicitly say “NEXT SLIDE” and “PREV SLIDE” with only one that looks clickable.

This **immediately suggests a slide based format** in a location that is hard to miss.

The **disabling of pathways** that are unavailable further simplify the user in understanding when they have completed the narrative while also allowing them to revisit previous scenes.

How does it help the user understand how data connects between scenes?

The **main textual narrative provides a story** that carries the user’s story from one page to the next.

In addition to this, the **map itself is stateful**. If the viewer clicks on a country, the next slide will maintain state and show new data for the same country. This enables the user to **analyze all stages of the presentation not just at a macro level but also at a per-country level**.

Scenes

Scene 1

The first scene deals with total trade as a % of GDP of each country. On this scene, the user is presented a narrative description of what the data entails and certain key observations are called out. The user may then click on any country to dive into understanding how that country performs.

Scene 2

The second scene deals with the change in % of trade over the past 60 odd years. Similarly, the viewer is given a narrative description followed by the ability to drill down into this new data.

Scene 3

Finally, the third scene deals with the difference in exports and imports along with a narrative on trade deficits. It then allows for the viewer to dive into newly presented data and make their conclusions.

Annotations

Annotation Template Used and why so

On every scene, there are two annotations.

One points to the country with the **largest data point in the map** while the **other points to the country with the smallest data point**.

Both annotations maintain **the same colour code used by the choropleth** informing the user how the choropleth is coloured along with the values that define the bounds of the map's choropleth.

The **annotations also provide an affordance** to the viewer suggesting to them that the map has more information that they can interact with if they'd like.

Supporting the message

The narrative on each scene tries to call out insights based on trade metrics. The annotations help provide examples to the same.

As an example, the first scene calls out how large economies (eg. USA, Japan) don't rely on trade as much as smaller nations. The annotations help support this by showing how the small country of Luxembourg is the country that trades the most on the international stage.

Changing with scenes

The annotations change the country they point to on each map.

This is required as the data being represented changes and updating the annotation helps the user identify countries that are relevant to the next scene in the narrative.

Parameters

Parameters used

The narrative maintains an identifier to the current scene being viewed.
A Scene object then maintains the information represented by each scene.
The narrative also maintains the currently active country that is selected (if selected).
Finally, the narrative maintains the most up-to-date set of annotations and parameters to represent which scene we are in.

States of the narrative:

Each scene is representative of a state of the narrative.
Additionally, each selected county has associated state that persists across scenes.

On a per-scene basis, the follow is used to manage state:

1. Main text: Each scene has a main text that represents the core narrative.
2. Descriptor: An additional descriptor provides addition hints based on the scene if needed.
3. Data Explanation: This provides insights into the data that the user is viewing based on the scene.
4. Data: The csv is pre-processed and each scene caches the data that is required by it to display content.

5. A mapping of numeric ISO ids to alpha ISO ids for countries
6. A mapping of alpha ISO ids to country names
7. Various variables that represent visual elements of the svg block

Parameters and State

On slide change, the current slide's identifier is updated. Associated with that, the state changes (to the next scene) and so the narrative text as well as the contents on the map are appropriately refreshed. The annotations are also updated and refreshed accordingly.

On country selection, identifiers that represent the active country and relevant data are updated. Since the state of active country changes, the region of the focus on the map changes (zoom in if a country is selected, zoom out on reset). Additionally, drill-down data of the country is updated so that the most recent information is presented. The annotation display is also appropriately adjusted.

Triggers

Available triggers

1. Next Slide Button: Used to move ahead in the narrative
2. Previous Slide Button: Used to revisit a previous scene in the narrative if desired
3. Map zoom: Used to look closer at a specific subset of the world map
4. Country Selection: Used to zoom into a specific country AND to view drill-down information on the selected country
5. Reset Map: Used to reset the map and clear country selection if present.

Affordances

1. Textual: The drill-down space of the visualization explicitly suggests the user click into the map to view details of the country.
2. Annotations: The annotations inform the user that countries have more information than just the choropleth's colour based index which subtly suggests interacting with the map.
3. Reset Map button: This button suggests to the user that the map may be interacted with (eg. zoom in, click on content, etc)
4. Disabled previous/next buttons: At start-up, since the viewer is on the first slide, the previous slide icon is disabled. This informs the user that the narrative is one dimensional and meant to progress forward (next slide). When it becomes enabled, the viewer comes to know that they can revisit a previous slide. Likewise, the next button gets disabled at the end of the narrative making it obvious that the narrative has reached its natural end point.