



Module #6: **Interactive Visualization**



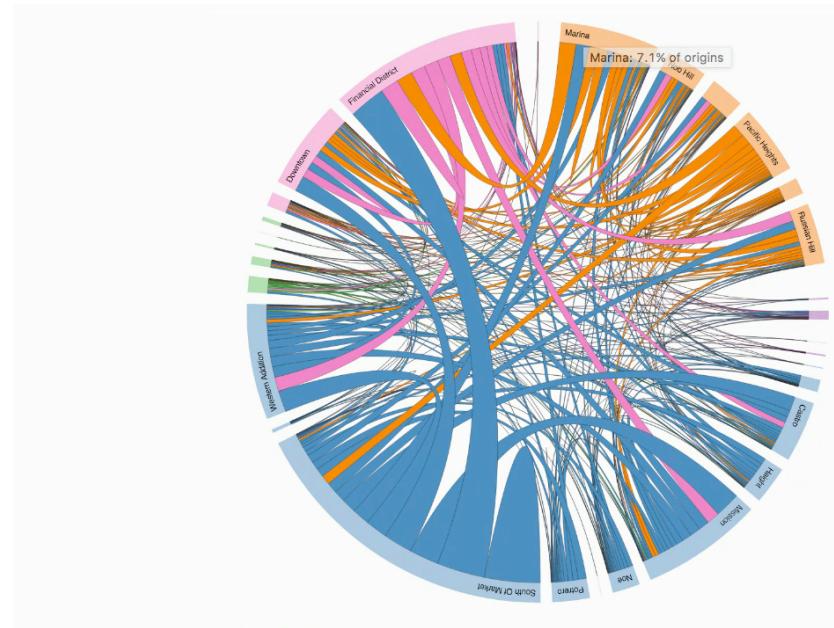
Objective

- Describe different ways users can interact with visualizations
- Explain the taxonomy of interactions
- Describe basic selection methods



Interaction

- Distinguishes data visualization from static paper visualizations.
- Analysis is a process, often iterative, with branches and sideways paths.





Main Purposes of Interaction

1. Tell storyline (usually over time)
 - Time-based playback
 - Sequence of actions based playback

2. Allow user to explore data (visual analytics)
 - Zoom in on details
 - Create different views into data
 - Change/Filter values
 - Show connections between data (including to other datasets)



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1. Time Storyline

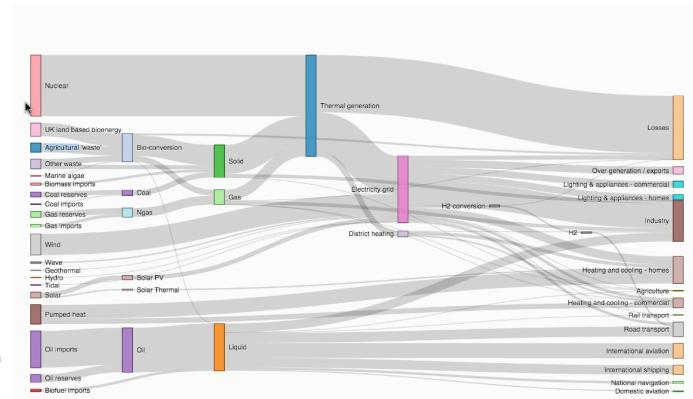
The image shows a YouTube video player interface. At the top, there is a navigation bar with a menu icon, the YouTube logo, and a search bar. Below the video player is a title card for a BBC Four video. The video itself features a man standing in a room filled with glowing, colored spheres. A large number '1982' is prominently displayed in the foreground. On the left side of the video frame, there is a vertical timeline with labels: '75 years', '50 years', and '25 years'. At the bottom of the timeline, there are monetary values: '\$400', '\$4 000', and '\$40 000'. The video player includes standard controls like play, pause, volume, and a progress bar showing '3:04 / 4:47'. Below the video frame, the title reads 'Hans Rosling's 200 Countries, 200 Years, 4 Minutes - The Joy of Stats - BBC Four'. The BBC logo is visible, along with a 'Subscribe' button and a view count of '3,555,130'. To the right of the video frame, it says '7,516,045 views'. At the bottom, there are options to 'Add to', 'Share', and 'More', along with like and dislike counts of '30,119' and '357'.

<https://www.youtube.com/watch?v=jbkSRLYSOjo>

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Acceptable Response Times

- **0.1 second** - limit for having the user feel that the system is reacting instantaneously
 - Animation, visual continuity, sliders
- **1 second** - user's flow of thought to stay uninterrupted, even though the user will notice the delay.
 - System response, pause in conversation
- **10 seconds** - keeping the user's attention focused on the dialogue. For longer delays, users will want to perform other tasks while waiting for the computer to finish
 - Cognitive response

Nielsen, "Usability Engineering", 1993



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