

FIT5147 DATA EXPLORATION AND VISUALIZATION

The Five Design Sheet

State of global happiness and the potential factors
affecting it

Tutor

Farah Tasnuba Kabir
Tutorial Number 04-P1

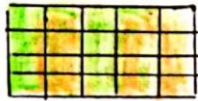
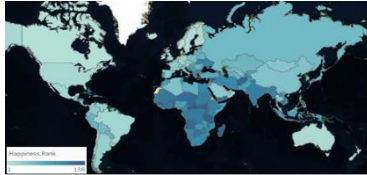
Submitted by

Manali Prakash Choudhary
30151198

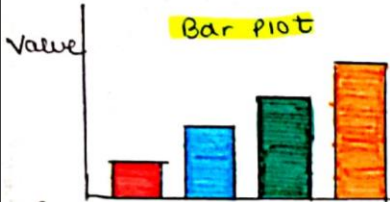
SHEET 1

IDEAS

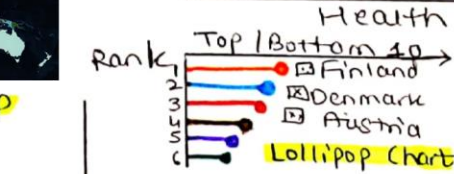
Choropleth World map



Heatmap



Bar plot



Health

Rank

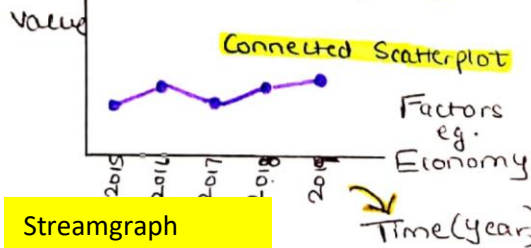
Top / Bottom 10

Finland

Denmark

Austria

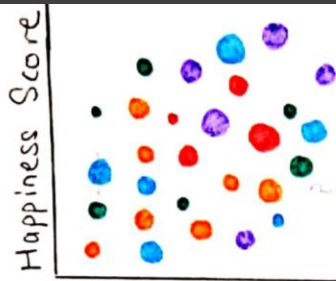
Lollipop Chart



Connected Scatterplot

Factors eg. Economy

Streamgraph



Happiness Score

Color - Regions

Size - Economy

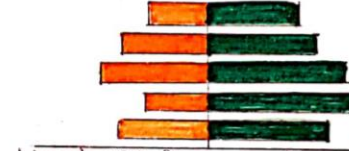
Time (Years)

Bubble Plot



Polar Area Chart

Country



Diverging Barplot

Audience: General Public, Policy makers (Governments & Communities)

Dataset (consist)

→ Happiness score, rank } 2015 to 2019
→ 6 factors responsible }
→ Countries (~158)
→ Mental Health Survey data
→ Age, Gender, Countries, Questions
→ Tech focused trend (Employment)
→ Overall (multivariate, Spatial data) (Categorical & Numeric)

Questions (Focus)

• Maps • Time series • Ranks
• Survey Q.s • Category

FILTER

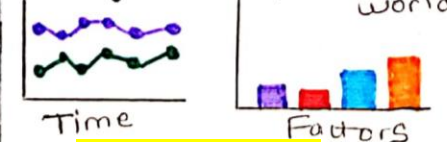
- 1) Bubble Plot ✓ Confusing / Informative
Scatter Plot ✓ Less Time consuming
variables to decode.
- 2) Table ✗ Not good readability
Heatmap ✗
- 3) Choropleth map ✓ Easy to
- 4) Shapes ✗ point / plot countries
- 5) Bar plot ✓ Polar Area Chart ✓
Lollipop Chart ✓ Rankings
Informative + Creative
- 6) Connected Scatterplot / Line / Area ✗ Time series
- 7) Correlation between Happiness rank and Survey Q. response? ✓ Emp. Support
Diverging Barplot

CATEGORIZE

Spatial Data
- Choropleth map

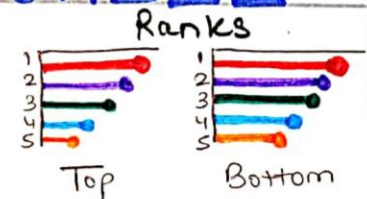
- Bubble chart

Categorical / Trends



Streamgraph

Correlation



Ranks

Top

Bottom

Country

H. Rank →

Factors

World

Year

Streamgraph

Correlation

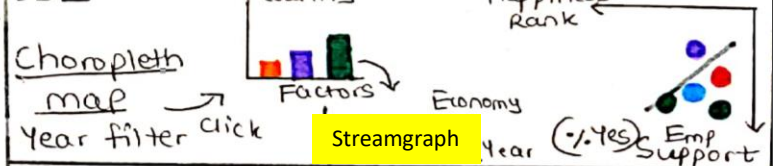
H. Rank

Year

Support

COMBINE & REFINE

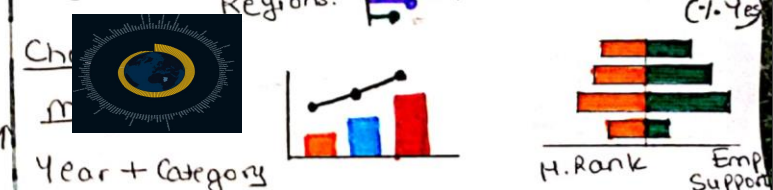
DS1



DS2



DS3



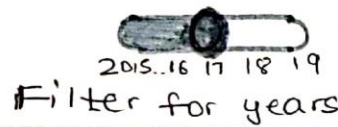
SHEET 2

DESIGN 1

LAYOUT

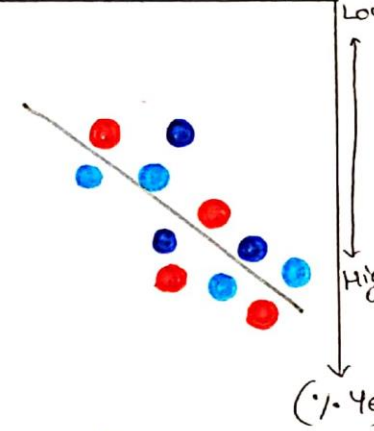


Color gradient according to Happiness Rank vs Year.



Click the Country

Happiness Rank
High ← → Low



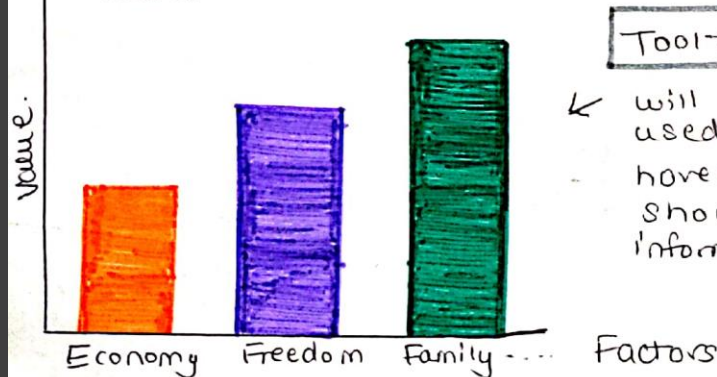
North America
Oceania
Western Europe

Colors! Regions

Employer Support for mental well Being.

FOCUS

Barplot for the factors for the country selected and the year or the world.

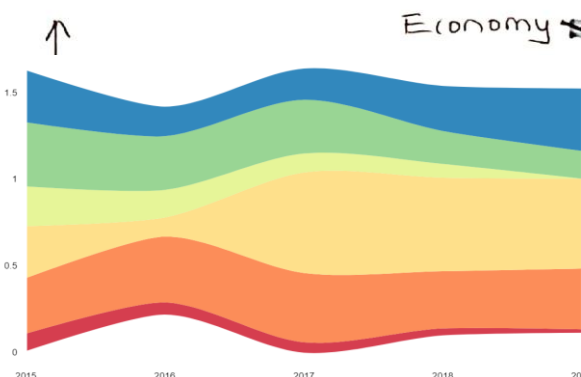


Tooltip

will be used on hover to show more information.

Category

Select the category to see the trend over years.



Title: Global State of Happiness and its potential causes.

Authors: Manali Choudhary

Date: 28-05-20 Sheet 1-FDS 2

Task: Happiness rank, causes and rep. using choropleth map, bar and line chart + scatterplot

OPERATIONS

- Users can view the world map which will have color gradient for countries by the Happiness Rank. and slide bar for year.
- Hovering will allow user to focus on that country and click to drill down further information showing the factors of happiness.
- Users can hover for tooltip and select the factor in the checkbox for trend of the factor over years.

DISCUSSION

Positive!

- Shows trend over time.
- Drill down of the information by country.
- Is simple stream understand by bar and line graph.

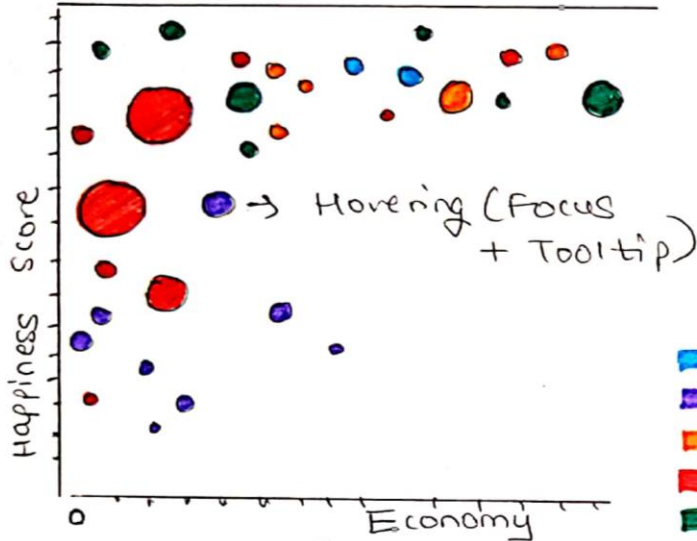
Negative:

- Is the scatterplot easy to understand?
- Is the checkbox really helping or can be avoided?
- Can we have separate tabs to drill down information?

SHEET 3

DESIGN 2

LAYOUT



2015 16 17 18 19

→ Slider for selecting year

Economy ▼

→ Dropdown change the 'xaxis' in the bubbleplot



Population

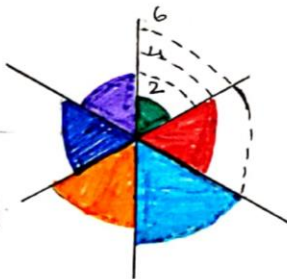
FOCUS

INDIA

Avg Scores of all years.

on hovering tooltip

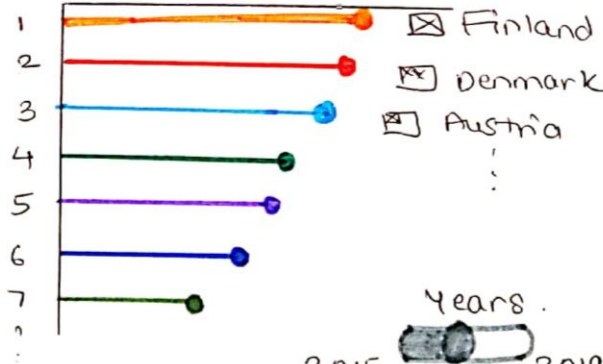
H.Rank - 80
Ranks of each factor



⇒ Polar Area chart.
Equal area of quadrants.
Hence, easy to understand

- Health
- Freedom
- Absence of Corruption
- Economy
- Generosity
- Family

Ranked Lollipopchart
- Top 10 -



Years.
2015 16 17 18 2019
→ Colors based on country

Title: Global state of happiness and its causes.

Authors: Manali Choudhary

Date: 29-05-20 Sheet: 2-FDS 3

Task: Happiness Scores on bubble plot and Polar chart with filters.

OPERATIONS

- User will be able to select the year by sidebar and the factor by selecting from dropdown. This will change the x axis in the bubblechart.
- The size of bubbles is based on Population and color on Region.
- When user clicks on a circle, a country is selected and the user can drill down to the factor for that country.
- User can change the year to see the Top 10 countries of that year.

DISCUSSION

Positive:

- User is able to customize the way he visualizes data.
- Ranking makes easy to know the Top countries based on Year filter.
- Polar area chart is easy to understand and comparison one factor to other factor.

Negative:

- Bubble chart makes it difficult to plot countries.
- Population data required (additional)
- No comparison with mental well being and repetitive filters.

SHEET 4

DESIGN 3 LAYOUT

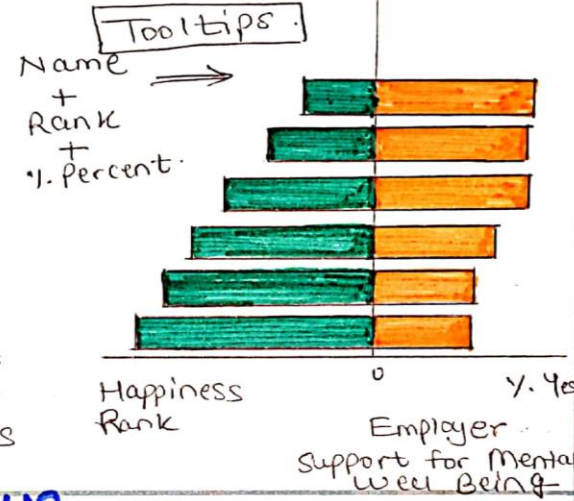
On hovering only tooltip and focus.



Years
2015 16 17 18 2019
Filter for Years.

Color gradient proportional to Happiness Scores.

⇒ mental well being.
% Yes Response of Employer Support.
Happiness Rank of country.



FOCUS

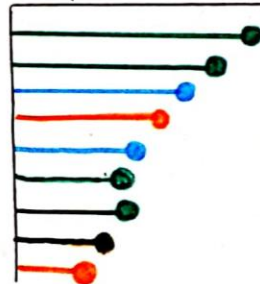
selected year.

INDIA

Country dropdown.
(alphabetically)
Bar chart with
scatterplot for trend

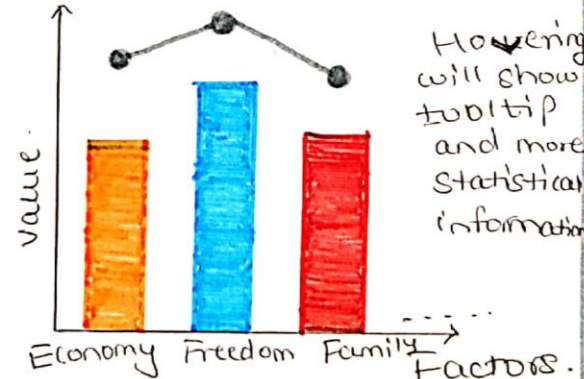
Rank by Regions.

Top 10 Bottom 10



Regions
Asia
Europe
Oceania
America
Africa

countries are colored by regions.



Title: Global State of Happiness and Causes
Authors: Mandali Choudhary
Date: 30-05-20 Sheet: 3-FDS-4
Task: Happiness rank, causes using choropleth map, lollipop, bar & diverging.

- ### OPERATIONS
- Users can hover the country for tooltip.
 - Along with the filter for years, the user can check the Top 10 and Bottom 10 countries by Regions.
 - User can select country from dropdown for checking trend over the happiness factors.
 - The mental Health well Being Response for 'Employer Support' can be compared with the Happiness Rank of those countries, along with tooltip.

DISCUSSION

- Positive:
- Comparison of mental Health well Being to Happiness Rank is on point.
 - Choropleth map is easy to understand along with the Ranks.
- Negatives:
- Ranks by region is vague.
 - Bar chart of Factors + Trend line is difficult to decode or rather confusing.
 - Filter (Dropdown) for countries is tedious for users.

SHEET 5

REALISATION

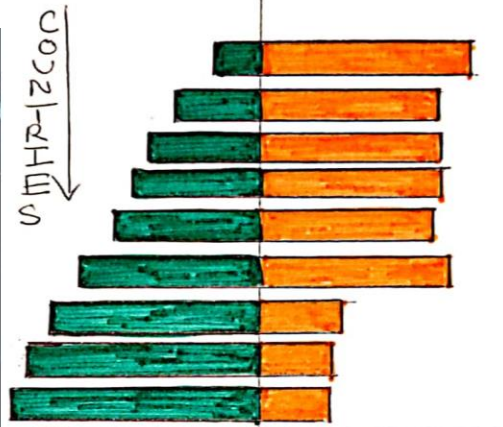


Year
2015 2019
(A) Happiness Rank (Big picture)

Category
Economy
(B) Happiness Reasons/Factors (Drill down)

LAYOUT

→ Relation between mental well being and Happiness.
(C)

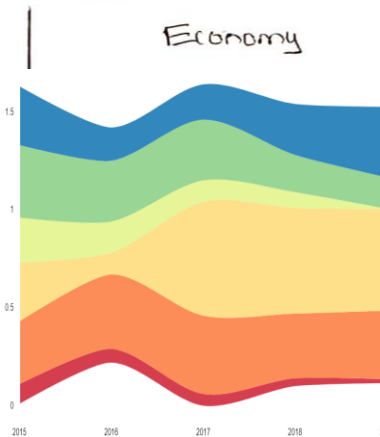
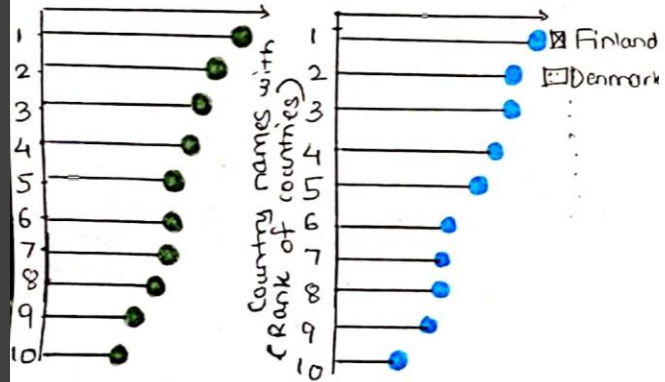


Happiness Rank 1 0 1 2 (Yes) Employer support for mental well being.

click country on Map

FOCUS

INDIA



Colors-Factors
Year-2019



Hovering on each plot will apply focus and tooltips

OPERATIONS

- Users can choose tabs A, B, C as shown
- Initially the user will be on tab A. Tab A shows the overall / Bigger view i.e. choropleth map with years filter showing the Happiness ranks. for the selected year on the filter.
- The user will see a Top 10 and Bottom 10 countries of the selected year in the filter, along with narrative
- Moving to Tab B, the Choropleth map can be filtered based on the categories/reasons for happiness. (2019)
- User can click on a country to see the trend for years 2015-2019
- User can also see the Polar Area chart for all the happiness factors.
- In Tab C, the user is able to see the relation between the countries who responded 'Yes' for Employer support for mental well being vs Happiness
- All the plots has hovering and tooltips

DETAIL

Technology - R shiny

Estimated effort - 80 hours effort to design visualization and testing.

Estimated cost - \$8000 excl. GST (80 x \$100 per hour for Data Visualization Analyst)

Estimated Schedule - 16 days at 5 hours per day

- Colour choices may vary based on color blind options for colors selection
- Data acquired from relevant sites and explored.