Electric Vehicle Charging Stations Global Network Review

Capstone Project

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Springboard: Introduction to Data Science Workshop

Credits:

Springboard, Mhairi McNeill (mentor), OpenChargeMap.org

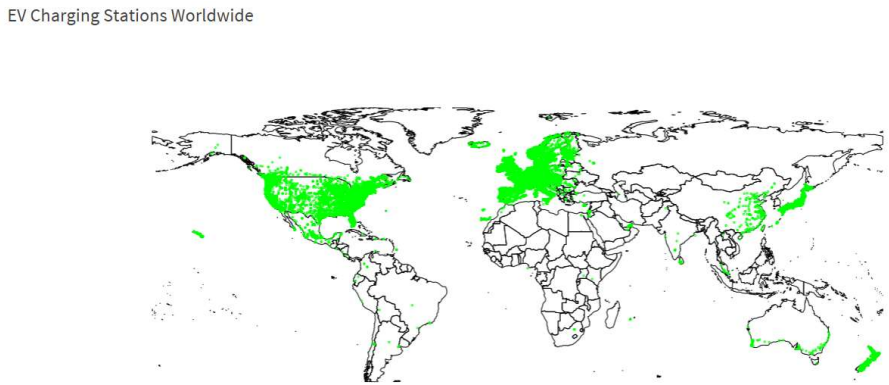
July 3,2017

Open Charge Map

Springboard RStudio Shiny

- The Goal:
  1. Design and provide interactive and user-friendly summary dashboard based on www.OpenChargeMap.org collected data.
  2. Tell the story of the data through visualizations in RShiny.

- The Client & Why Bother:
  1. OpenChargeMap team (improve their own data; alternative for website viewer)
  2. An electric vehicle user (alternative view of local/global data; increased data reliability)
  3. A researcher, student, or any other user (learn/explore; improve)



- Opportunities:
  1. Data collection:
     - Correct the 'country ID' coding: Corrected country ID list now available.
     - Improve updating the station validation status:
       - Currently, ~2% of ~70k entries marked as ‘recently validated’

  2. Statistical analysis:
     - Option of including other data sources may introduce interesting opportunities for advanced statistical modelling
       - Additional data sources may include: population census data, proximity of stations to the highway systems, electric vehicle sales data, or alternative vehicle 'charging' stations (like natural gas or gasoline)

  3. RShiny Dashboard:
     - Improve mapping
     - Alter ‘country IDs’ – add country names list dropdown

- Data Set
  - Data set for the electric vehicles charging stations as published by the OpenChargeMap.com
  - Source: https://api.openchargemap.io/v2/poi/?output=json&maxresults=130000&compact=true&verbose=false

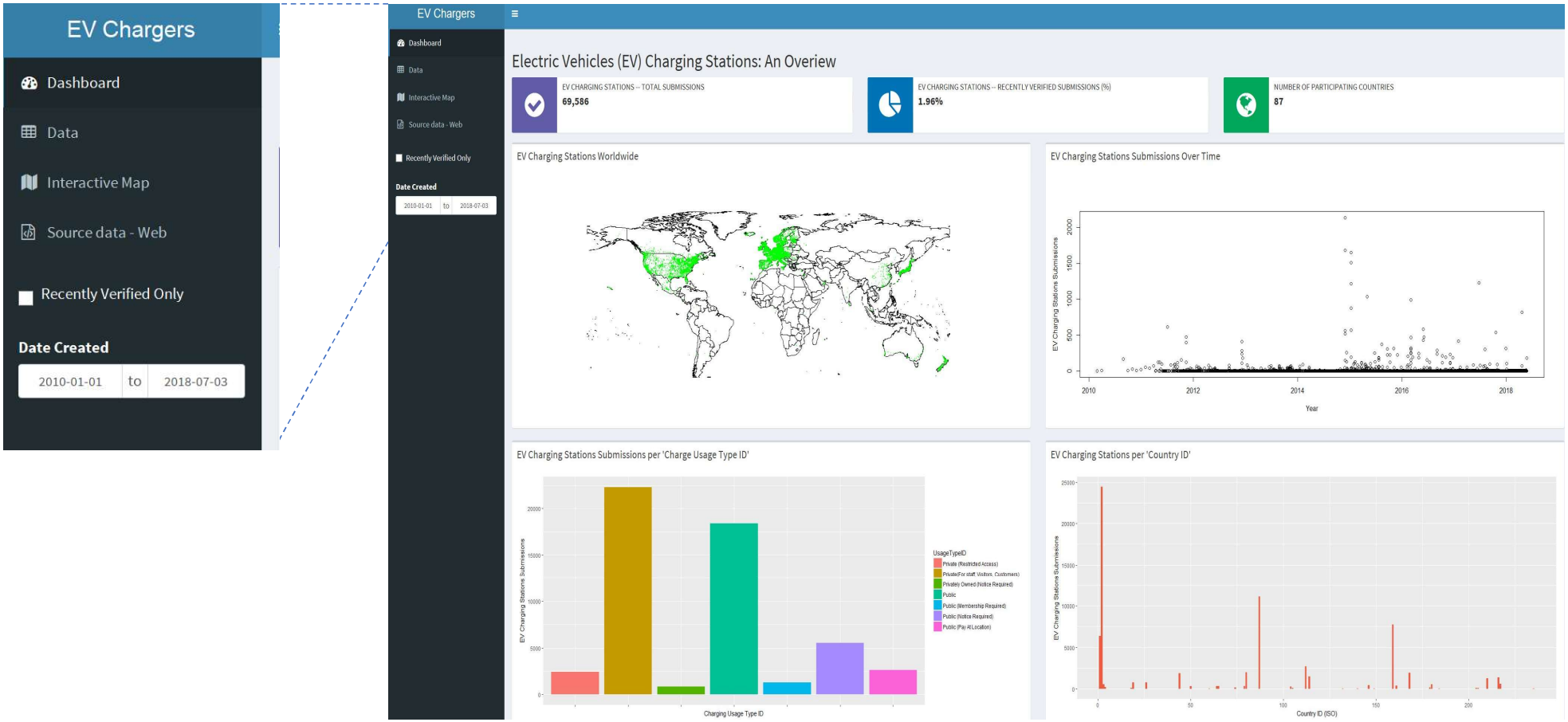
- Data Wrangling
  - Data review, evaluation, and summary. Decided to keep 21 variables. Excluded all other variables.
  - Examples of data wrangling applied:
    - Mutated column names; changed N/A values to “0” values as needed (then excluded from visuals as needed); variable value replacement for 'UsageTypeID’, etc.

- Data Visualization & Storytelling
  - Data formatting:
    - Summary dashboard boxes display expected summary data formatting (i.e comma in thousands, %).
  - I wire-framed the Shiny App look for the data, as I visualized it.
    - Made a 'prototype' in MS PowerBI.
  - Learned to use RShiny App to display the summary Dashboard for the complete data set and its subset.
  - Followed mentor’s advice

- Exploratory Data Analysis Summary
  - Generally, weak relationships among most of the 21 variables in my final raw data
  - Due to the nature of the data, an interactive data visualization approach best to interpret the data set
  - RShiny App is the best environment for an interactive visualization of this data set
  - Interesting insights from this data set come from: timeseries, statistic summary, mapping/plotting
  - RShiny App is the best environment for an interactive visualization of this data set

- Deliverables – Capstone Final Project
  - All on Github(https://github.com/stonka/Springboard-Capstone-Final-Electric-Vehicles-Shiny-Dashboard)
    1. Final Code (generate data, Shiny dashboard)
    2. Final Report
    3. Final Slide Deck
    4. ShinyApp Project link: https://tonkakozarovafenichel.shinyapps.io/Springboard_Capstone_CarDashboard_Final/

Outcome Summary: Dashboard



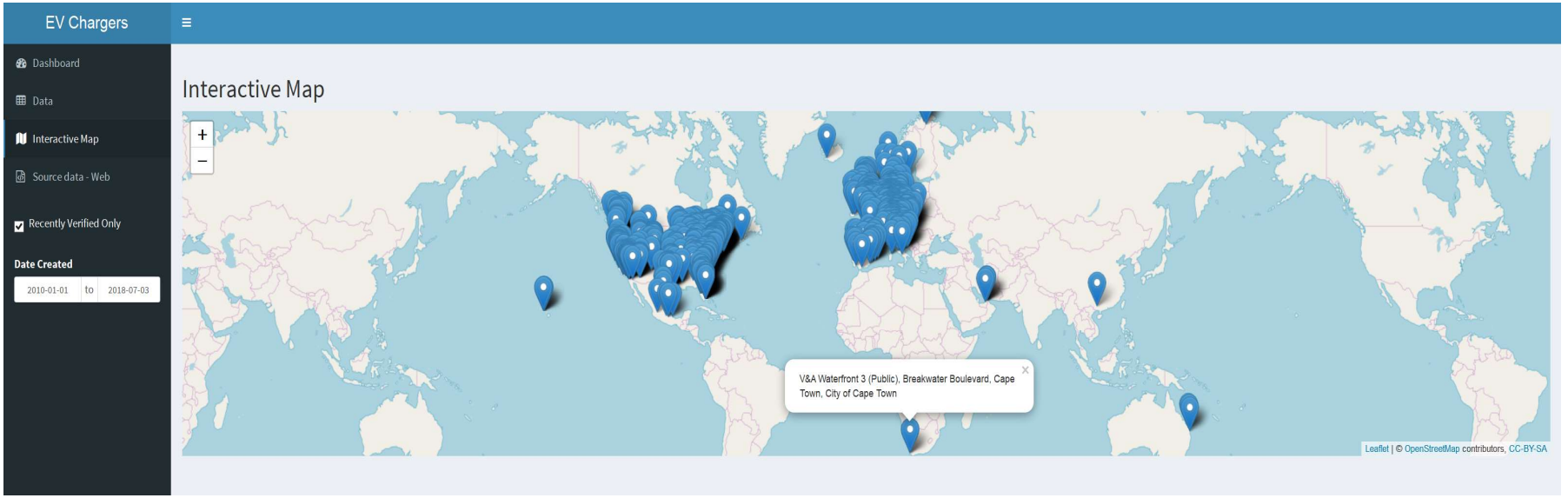
https://tonkakozarovafenichel.shinyapps.io/Springboard_Capstone_CarDashboard_Final/

Outcome Summary: Data (Interactive Output)

operatorID	UsageTypeID	AddressInfoID	Address	AddressInfoTitle	AddressInfoAddressLine1	AddressInfoTown	AddressInfoStateOrProvince	AddressInfoPostcode	AddressInfoCountryID	AddressInfoLatitude	AddressInfoLongitu
1	Private(For staff, Visitors, Customers)	105225	L. Stuokos-Gucevičiaus a., L. Stuokos-Gucevičiaus a., Kupiškis, Kupiškio rajonas	L. Stuokos-Gucevičiaus a.	L. Stuokos-Gucevičiaus a.	Kupiškis	Kupiškio rajonas	40130	131	55.83842	24.974402
23	Public	105217	La Seu d'Urgell Supercharger, 40 Carrer del Bisbe Benlloch, La Seu d'Urgell, NA	La Seu d'Urgell Supercharger	40 Carrer del Bisbe Benlloch	La Seu d'Urgell			210	42.35893	1.462817
20	Public	105209	Ipswich Hospital, Heath Road, Ipswich Hospital, Heath Road, Ipswich, Suffolk	Ipswich Hospital, Heath Road	Ipswich Hospital, Heath Road	Ipswich	Suffolk	IP4 5PD	1	52.05684	1.197910
32	Public	105206	Salt Hill Family Activity Centre, Salt Hill Family Activity Centre, NA, NA	Salt Hill Family Activity Centre	Salt Hill Family Activity Centre			SL1 3SR	1	51.51231	-0.606822
45	Private(For staff, Visitors, Customers)	105232	ISAVIA Leifstöð, Keflavikurflugvelli, Reykjanesbær, NA	ISAVIA Leifstöð	Keflavikurflugvelli	Reykjanesbær		235	105	63.99704	-22.620971
45	Private(For staff, Visitors, Customers)	105233	ON Ólafsvík, Ólafsbraut, Ólafsvik, NA	ON Ólafsvik	Ólafsbraut	Ólafsvik		355	105	64.89430	-23.704991

https://tonkakozarovafenichel.shinyapps.io/Springboard_Capstone_CarDashboard_Final/

Outcome Summary: Map (Interactive Output)



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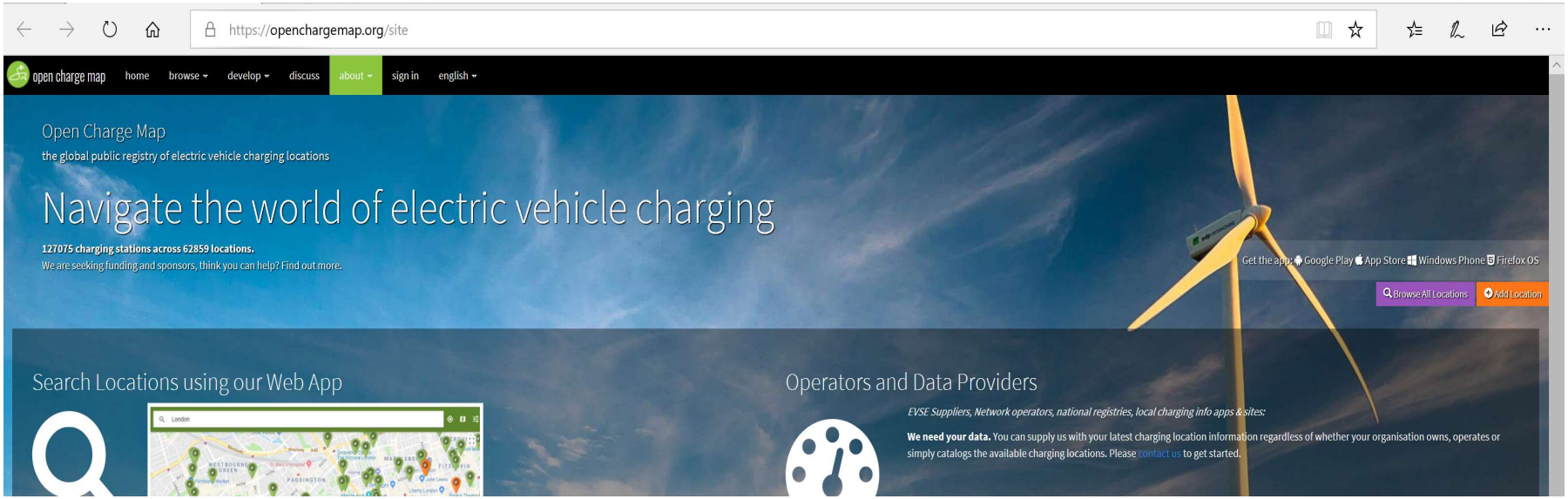
Outcome Summary: Data Source



https://openchargemap.org/site

https://tonkakozarovafenichel.shinyapps.io/Springboard_Capstone_CarDashboard_Final/

Thank you & Questions

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