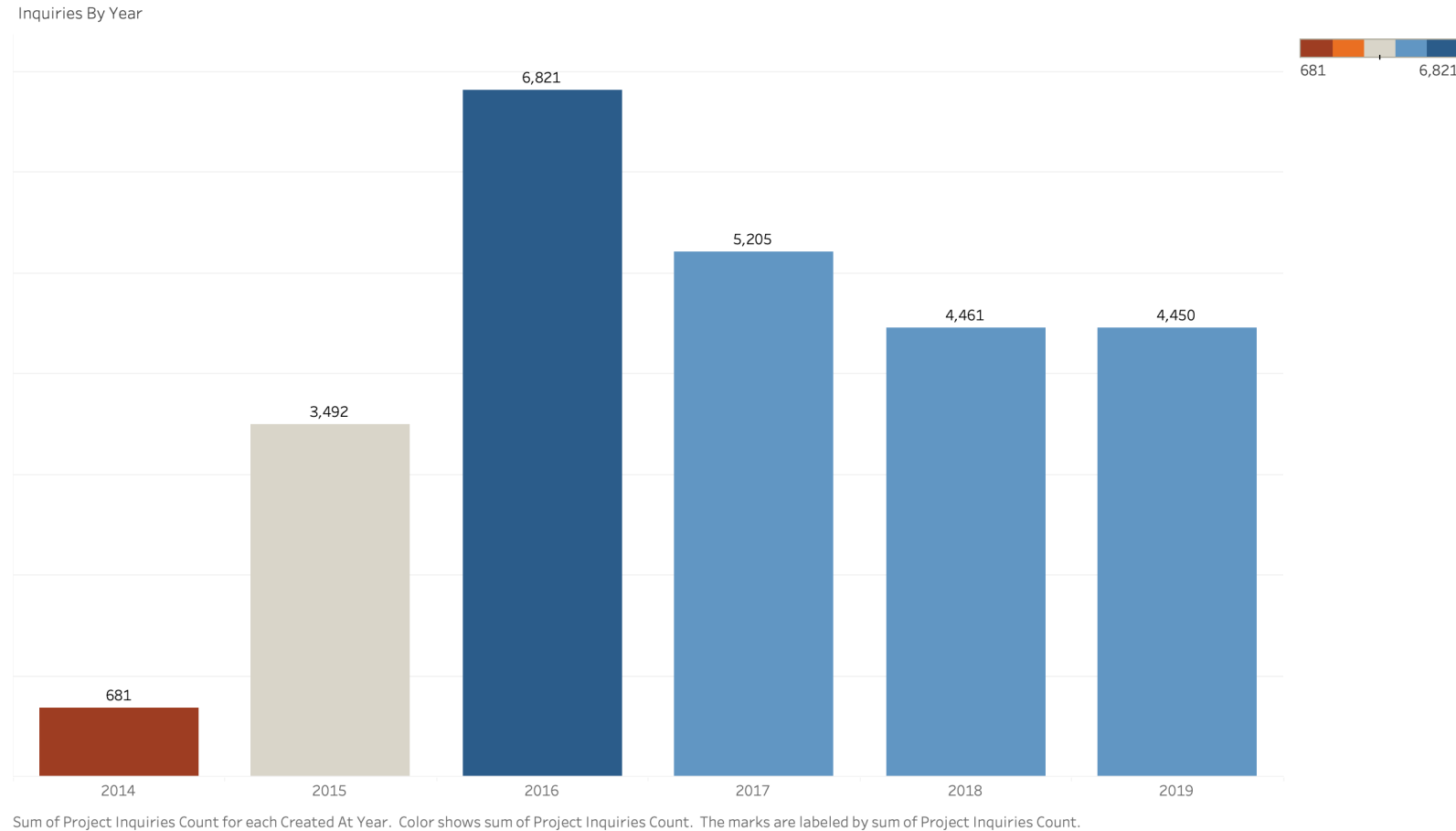


# Problem Sets

I decided to analyze project types and which types tend to show higher performance results.

- Which project types produced the best outcomes in survey data?
- Which project types perform better on the platform by match rate, days to match, and number of inquiries received?
- Which project types take the longest to complete?



## Datasets

- I used four datasets from Taproot to get the desired results: Project\_export, Project\_categories, Project\_Inquiries and Session\_export.
- I've cleaned the data using python to remove all the null values from the columns and rows to reduce redundancy and dimensionality.
- I also created new calculated columns such as days\_to\_update (seen below) and succeeded by mapping existing values and grouping them to category keys.

```
In [14]: Prjts.sort_values(by='id',axis=0).head()
```

```
Out[14]:
```

id	organization_id	description	created_at	updated_at	state	user_id	project_inquiries_count	project_category_id	timeline	days_to_update
31	35	multipage brochure design	2014-08-19 14:53:23.622273	2015-02-20 19:59:24.590494	completed	1301	1	14	2	185
32	36	print design	2014-08-19 14:53:23.661564	2015-02-20 19:59:24.614798	completed	1302	1	14	2	185
33	37	NaN	2014-08-19 14:53:23.668844	2015-06-28 02:48:38.165214	completed	1303	1	20	2	312
34	477	Marketing consultation for campaign design	2014-08-19 14:53:23.683657	2015-02-20 19:59:24.628209	completed	1304	1	10	2	185
35	39	photography	2014-08-19 14:53:23.697066	2015-02-20 19:59:24.639884	closed	1305	0	13	2	185

```
In [21]: User_Inqry = User_Inqry.drop(labels=['scheduled_for', 'decision_deadline', 'conference_line_id', 'hours', 'pbc_rating',
      'npo_rating', 'satisfaction_rating', 'pbc_review', 'archived', 'time_slots'], axis=1)
User_Inqry['created_at'] = pd.to_datetime(User_Inqry['created_at'], format="%Y-%m-%d %H:%M:%S.%f")
User_Inqry['updated_at'] = pd.to_datetime(User_Inqry['updated_at'], format="%Y-%m-%d %H:%M:%S.%f")
User_Inqry['days_to_update'] = (User_Inqry['updated_at'] - User_Inqry['created_at']).dt.days
```

```
In [22]: User_Inqry['state'].unique()
```

```
Out[22]: array(['rejected', 'pbc_expired', 'npo_expired', 'cancelled', 'completed',
      'failed', 'accepted', 'admin_close', 'npo_rescheduled',
      'confirmed', 'applied', 'pbc_rescheduled', 'missed'], dtype=object)
```

```
In [23]: mapping={
      'rejected': 'inqry_failed',
      'pbc_expired': 'inqry_failed',
      'npo_expired': 'inqry_failed',
      'cancelled': 'inqry_failed',
      'failed': 'inqry_failed',
      'admin_close': 'inqry_failed',
      'missed': 'inqry_failed'
    }
User_Inqry['inqry_failed'] = User_Inqry['state'].map(mapping) == 'inqry_failed'
User_Inqry["inqry_failed"] = User_Inqry["inqry_failed"].astype(int)
```

- Example of some of the data preprocessing of the user\_inqry dataset and a glance of the dataset as a sanity check that the data looks valid.

```
In [24]: User_Inqry.tail()
```

```
Out[24]:
```

	id	user_id	project_id	qualifications	created_at	updated_at	state	days_to_update	inqry_failed
25079	26952	178353	11395	I have design, content generation, and proofre...	2019-11-20 22:00:51.252953	2019-12-11 19:59:09.406476	pbc_expired	20	1
25080	26920	4172	11396	I live in Silicon Valley and work in tech as w...	2019-11-19 12:00:24.619799	2019-11-28 00:35:09.857962	accepted	8	0
25081	27064	182933	11450	I began my post-graduate professional career w...	2019-11-28 04:14:16.024452	2019-11-28 22:11:00.901167	rejected	0	1
25082	27033	174579	4129	I am an integrated communications expert with ...	2019-11-25 23:09:52.848121	2019-11-28 23:42:01.560910	accepted	3	0
25083	27069	182947	11796	Hello,\nMy background is in Business Analysis ...	2019-11-28 17:41:20.908411	2019-12-10 03:57:53.690976	accepted	11	0

# Data Prep and Visualization

- I'm using Python to clean and process the data due to its flexibility and ease of documentation.
- Tableau is used for data visualization due to its user friendly and intuitive GUI and its beautiful visuals.

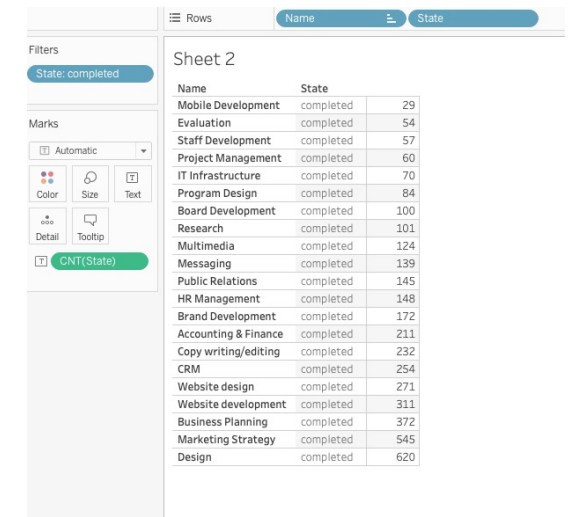


Tableau interface showing a table of project data. The table has columns for Name, State, and a numerical value. The filter 'State: completed' is applied. The marks card shows 'Automatic' and 'CNT(State)'.

Name	State	
Mobile Development	completed	29
Evaluation	completed	54
Staff Development	completed	57
Project Management	completed	60
IT Infrastructure	completed	70
Program Design	completed	84
Board Development	completed	100
Research	completed	101
Multimedia	completed	124
Messaging	completed	139
Public Relations	completed	145
HR Management	completed	148
Brand Development	completed	172
Accounting & Finance	completed	211
Copy writing/editing	completed	232
CRM	completed	254
Website design	completed	271
Website development	completed	311
Business Planning	completed	372
Marketing Strategy	completed	545
Design	completed	620

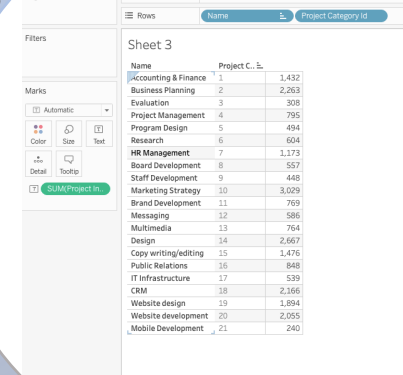
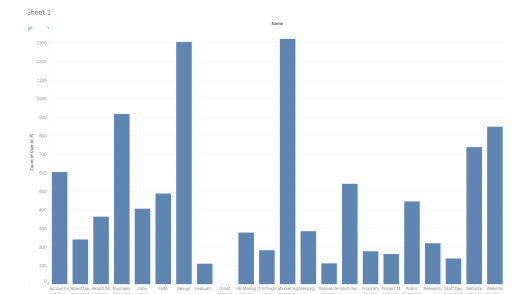


Tableau interface showing a table of project data. The table has columns for Name, Project Category Id, and a numerical value. The filter 'State: completed' is applied. The marks card shows 'Automatic' and 'SUM(Project Id)'.

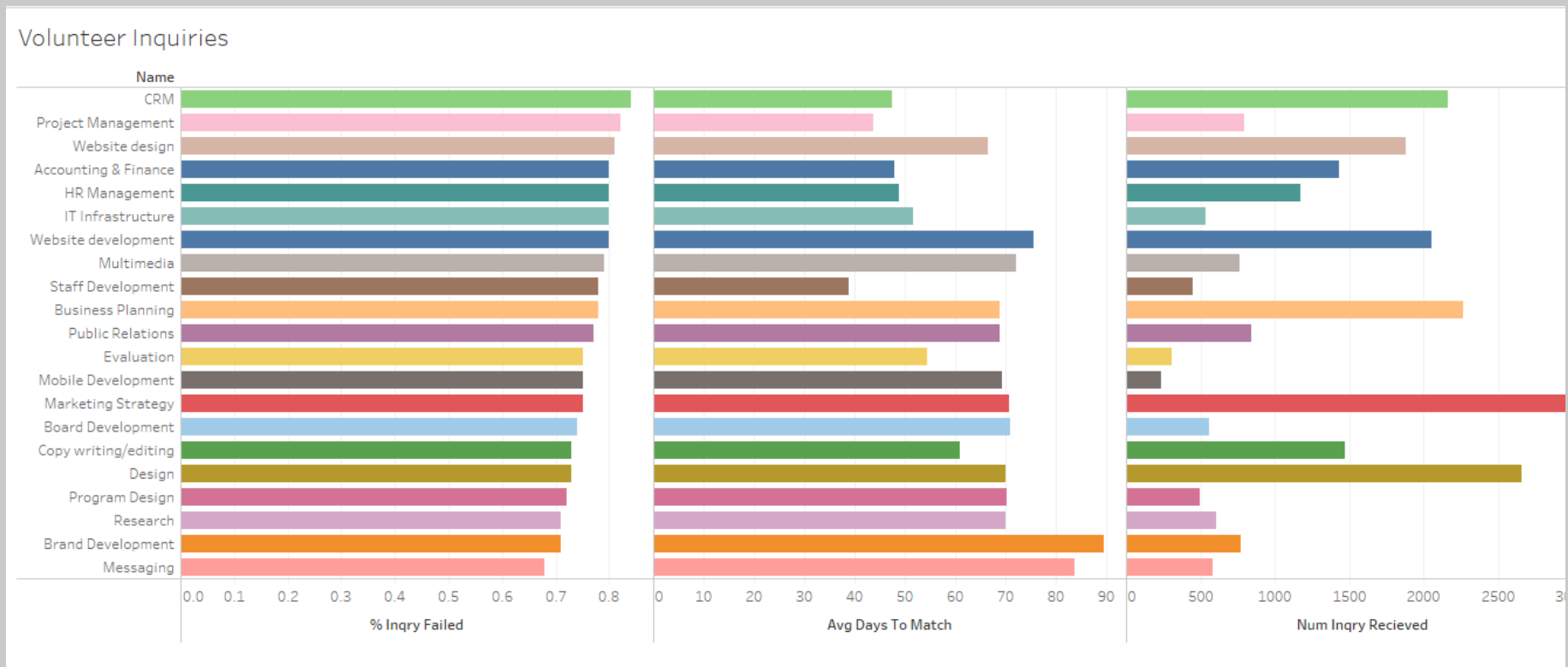
Name	Project Category Id	
Accounting & Finance	1	1,432
Business Planning	2	2,263
Evaluation	3	308
Project Management	4	795
Program Design	5	494
Research	6	604
HR Management	7	1,173
Board Development	8	557
Staff Development	9	448
Marketing Strategy	10	3,029
Brand Development	11	769
Messaging	12	586
Multimedia	13	764
Design	14	2,567
Copy writing/editing	15	1,476
Public Relations	16	848
IT Infrastructure	17	539
CRM	18	2,166
Website design	19	1,894
Website development	20	2,055
Mobile Development	21	240



## Q.1 Which project types produce the best outcomes in survey data?

- We can see from the graph that Copy Writing/Editing has on average the best outcomes with a 59% success rate among all the project categories.
- Interestingly, most project categories had an average success rate below 50%, with the Marketing group category taking both the top and bottom spots with a 29% success rate of Multimedia Development alongside Copy Writing/Editing in the top spot.





Q.2 Which project types perform better on the platform?

Match Rate, Days To Match, # of Inquiries Received.

- It doesn't appear there's a correlation between number of volunteer inquiries received and the days taken to match a volunteer to a project.
- Most volunteer inquiries don't result in being matched with a project. Regardless of category, volunteers have between a 65-80% chance of not working on a project.

### Q.3 Which project types take the longest to complete? Shortest?

- We can see from the scatter plot that Public Relations takes longest time to complete with an average of 178 days.
- Staff Development takes the shortest time with 99 days on average.
- Across all categories a project takes on average 140 days.
- Or, put another way, each project takes on average just over half a year to complete from the moment a project is posted.

Project Success vs. Days to Completion

