Corporate Data Analysis

Importing Libraries

Importing Libraries

In [2]:

```
import matplotlib.pyplot as plt
import seaborn as sns
from matplotlib.ticker import FuncFormatter
import plotly.express as px
from wordcloud import WordCloud
```

Reading DataSet

In [3]:

```
df = pd.read_csv('/kaggle/input/bigpicture-company-dataset/companies-2023-q4-sm.csv')
```

In [4]:

```
df.head()
```

Out[4]:

	handle	name	website	industry	size	type	founded	city	state	count
0	company/&-shayna-solution-partners	& Shayna solution partners	andshayna.com	retail	1-10	Partnership	NaN	NaN	NaN	
1	company/'addinall-management-and-systems'	'Addinall Management and Systems'	NaN	business consulting and services	NaN	NaN	NaN	NaN	NaN	
2	company/'baden-regio'-gemeinden-region-baden-w...	'Baden Regio', Gemeinden Region Baden-Wettingen	baden-regio.ch	NaN	NaN	NaN	NaN	Wettingen	Aargau	
3	company/'friends-with-rice'-stichting-'vriend...	'Friends With Rice' / Stichting 'Vrienden Met ...	vriendenmetrijst.nl	philanthropic fundraising services	1-10	Nonprofit	2014.0	Lisse	South Holland	
4	company/'i-say'-supported-living-services-limited	'I SAY' SUPPORTED LIVING SERVICES LIMITED	NaN	consumer services	NaN	NaN	NaN	Rochester	England	

In [5]:

```
df.shape
```

Out[5]:

```
(17154017, 10)
```

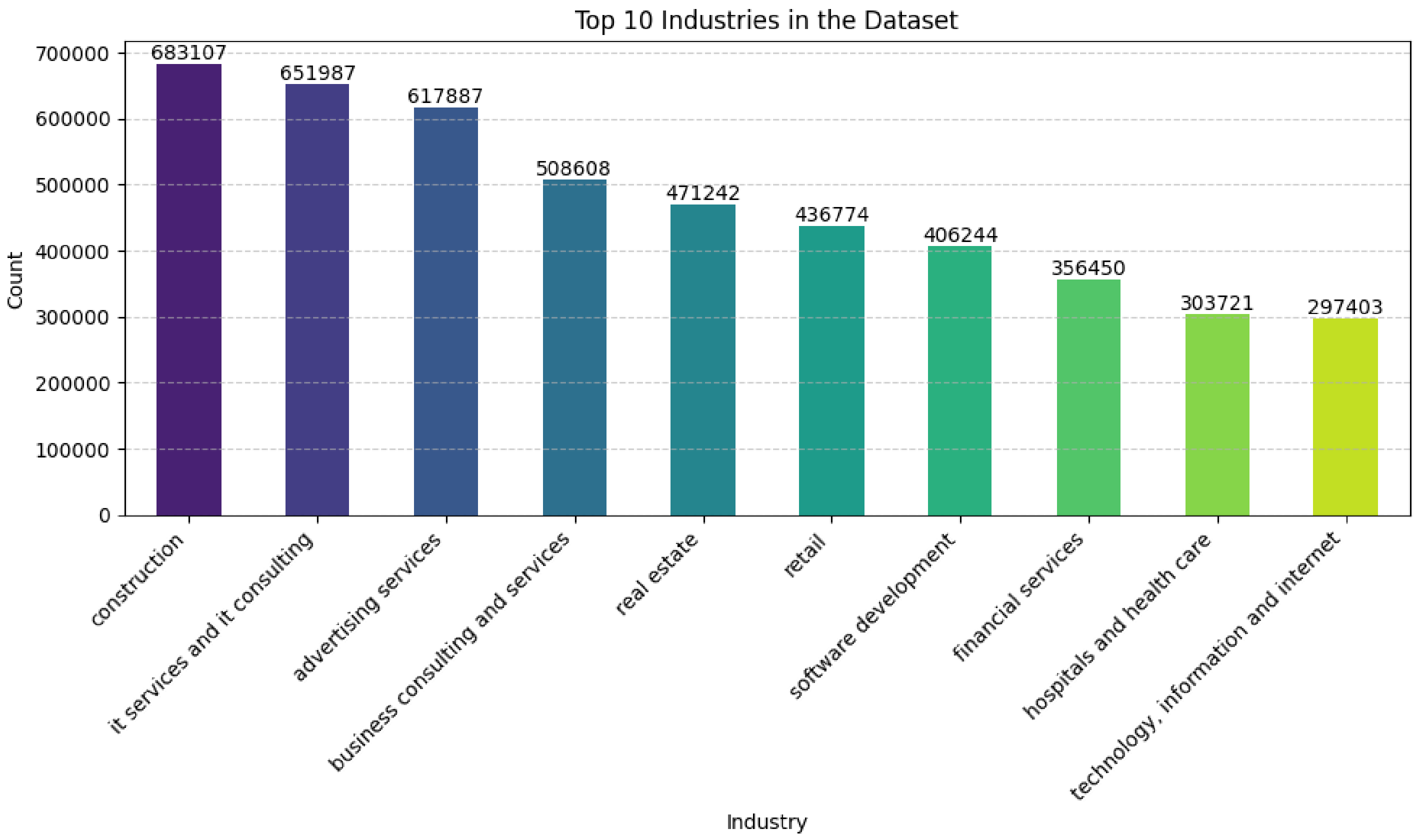
□ Visualization

1. Top 10 Industries

In [23]:

```
industry_distribution = df['industry'].value_counts()
```

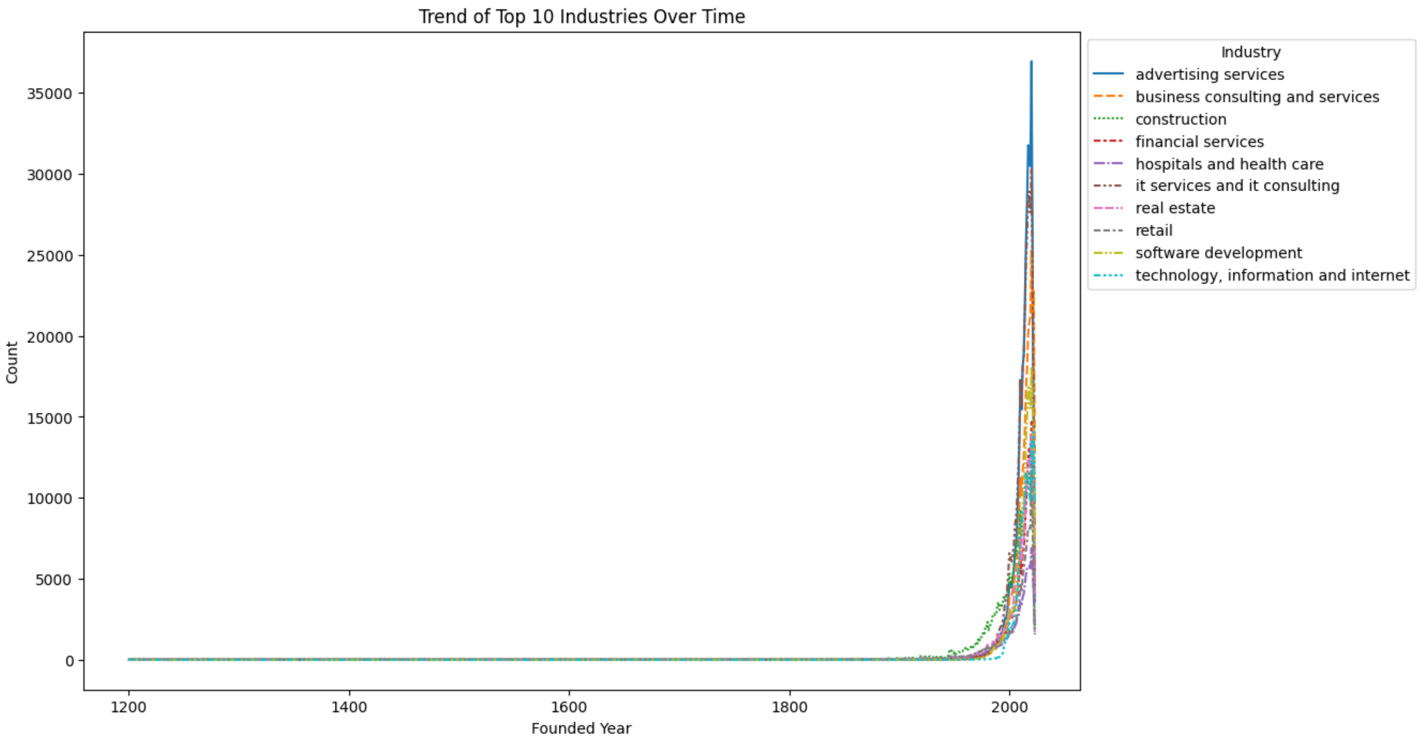
```
# Select the top 10 industries
top_industries = industry_distribution.head(10)

# Use a colorful palette from seaborn
colors = sns.color_palette('viridis', len(top_industries))

# Plot a vertical bar chart for the top 10 industries
plt.figure(figsize=(10, 6))
top_industries.sort_values(ascending=False).plot(kind='bar', color=colors)
plt.title('Top 10 Industries in the Dataset')
plt.xlabel('Industry')
plt.ylabel('Count')
plt.grid(axis='y', linestyle='--', alpha=0.6)

# Display the count values on the bars
for index, value in enumerate(top_industries.sort_values(ascending=False)):
    plt.text(index, value, str(value), ha='center', va='bottom')

plt.xticks(rotation=45, ha='right')  # Rotate x-axis labels for better readability
plt.tight_layout()  # Adjust layout to prevent clipping of labels
plt.show()
```



2. Industry Trend over Time

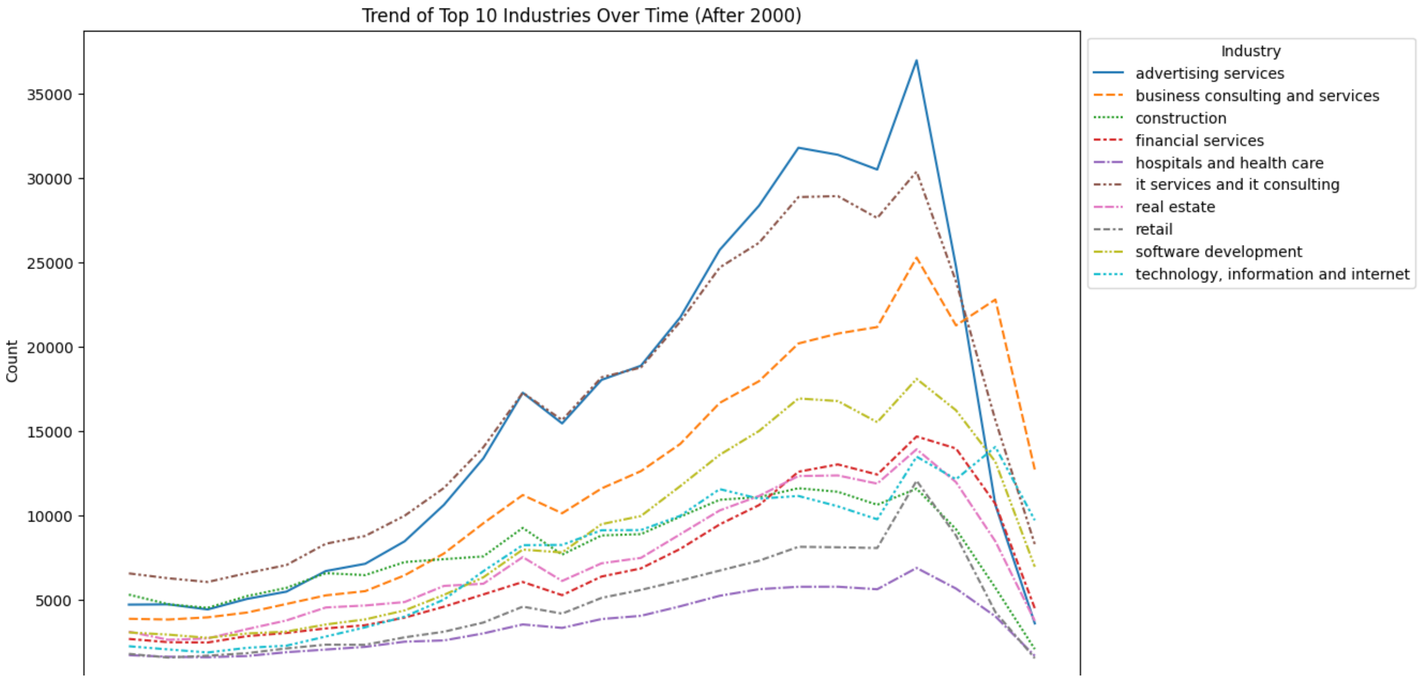
In [8]:

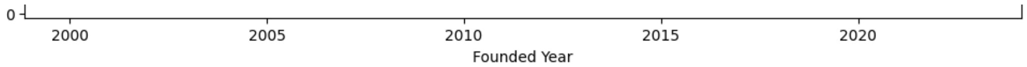
```
top_industries = df['industry'].value_counts().head(10).index

# Filter the dataset for the top 10 industries
top_industries_data = df[df['industry'].isin(top_industries)]

# Group by 'industry' and 'founded' and calculate counts
industry_trends = top_industries_data.groupby(['industry', 'founded']).size().unstack(fi
ll_value=0)

# Plot the trend data
plt.figure(figsize=(12, 8))
sns.lineplot(data=industry_trends.T)  # Transpose the data for better visualization
plt.title('Trend of Top 10 Industries Over Time')
plt.xlabel('Founded Year')
plt.ylabel('Count')
plt.legend(title='Industry', bbox_to_anchor=(1, 1), loc='upper left')
plt.show()
```



In [9]:

```
top_industries = df['industry'].value_counts().head(10).index

# Filter the dataset for the top 10 industries and years after 2000
top_industries_data = df[(df['industry'].isin(top_industries)) & (df['founded'] >= 2000)
]

# Group by 'industry' and 'founded' and calculate counts
industry_trends = top_industries_data.groupby(['industry', 'founded']).size().unstack(fi
ll_value=0)

# Plot the trend data
plt.figure(figsize=(12, 8))
sns.lineplot(data=industry_trends.T)  # Transpose the data for better visualization
plt.title('Trend of Top 10 Industries Over Time (After 2000)')
plt.xlabel('Founded Year')
plt.ylabel('Count')
plt.legend(title='Industry', bbox_to_anchor=(1, 1), loc='upper left')

plt.show()
```





3. Size Distribution

In [10]:

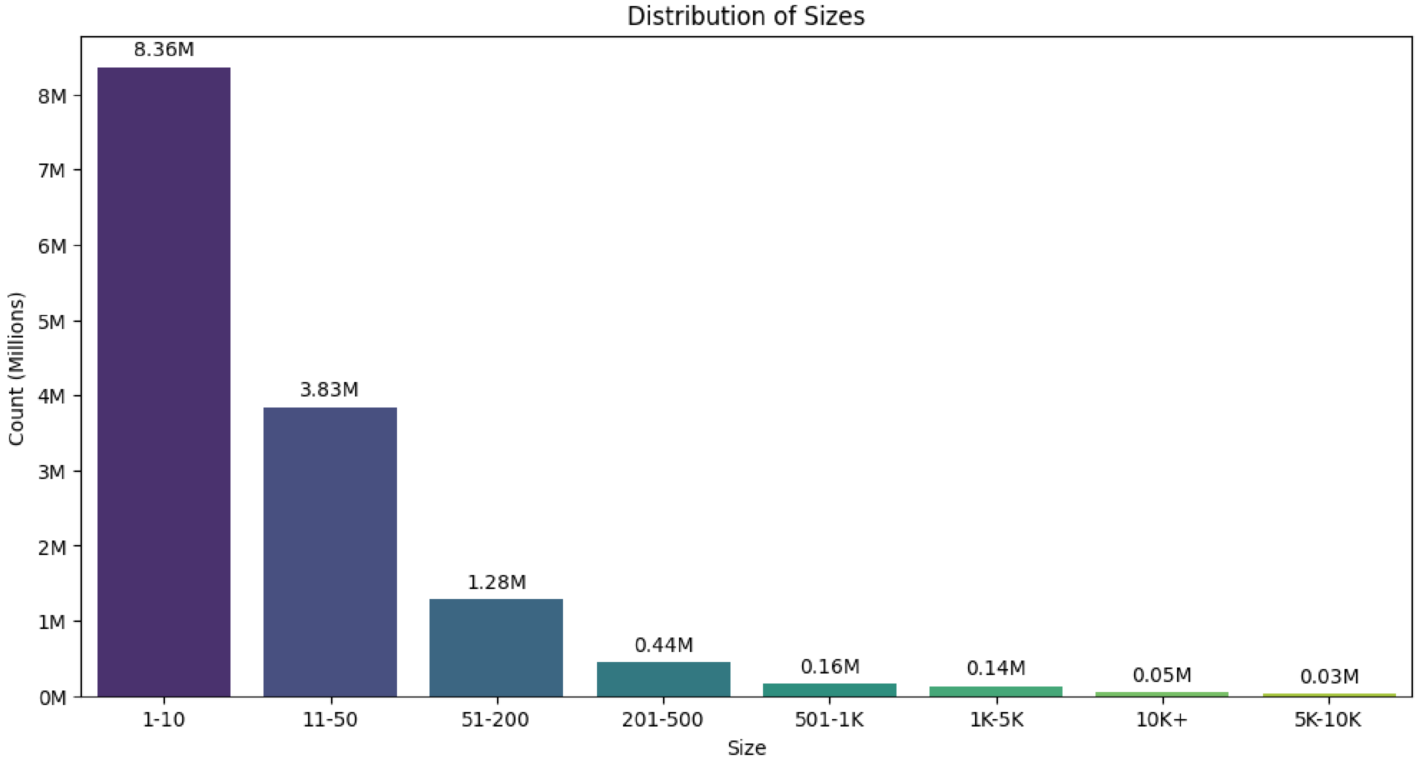
```
df['size'].unique()
```

Out[10]:

```
array(['1-10', nan, '11-50', '1K-5K', '51-200', '201-500', '501-1K',
       '5K-10K', '10K+'], dtype=object)
```

In [11]:

```
sizes = df['size'].dropna()

# Count the occurrences of each size category
size_counts = sizes.value_counts()

# Plot the distribution of sizes with seaborn
plt.figure(figsize=(12, 6))
ax = sns.barplot(x=size_counts.index, y=size_counts.values / 1e6, palette='viridis')

# Display the count values on the bars in millions
for index, value in enumerate(size_counts.values):
    plt.text(index, (value / 1e6) + 0.1, f'{value / 1e6:.2f}M', ha='center', va='bottom'
, fontsize=10)

# Format y-axis to show values in millions
ax.yaxis.set_major_formatter(FuncFormatter(lambda x, _: f'{x:.0f}M'))

plt.title('Distribution of Sizes')
plt.xlabel('Size')
plt.ylabel('Count (Millions)')
plt.show()
```

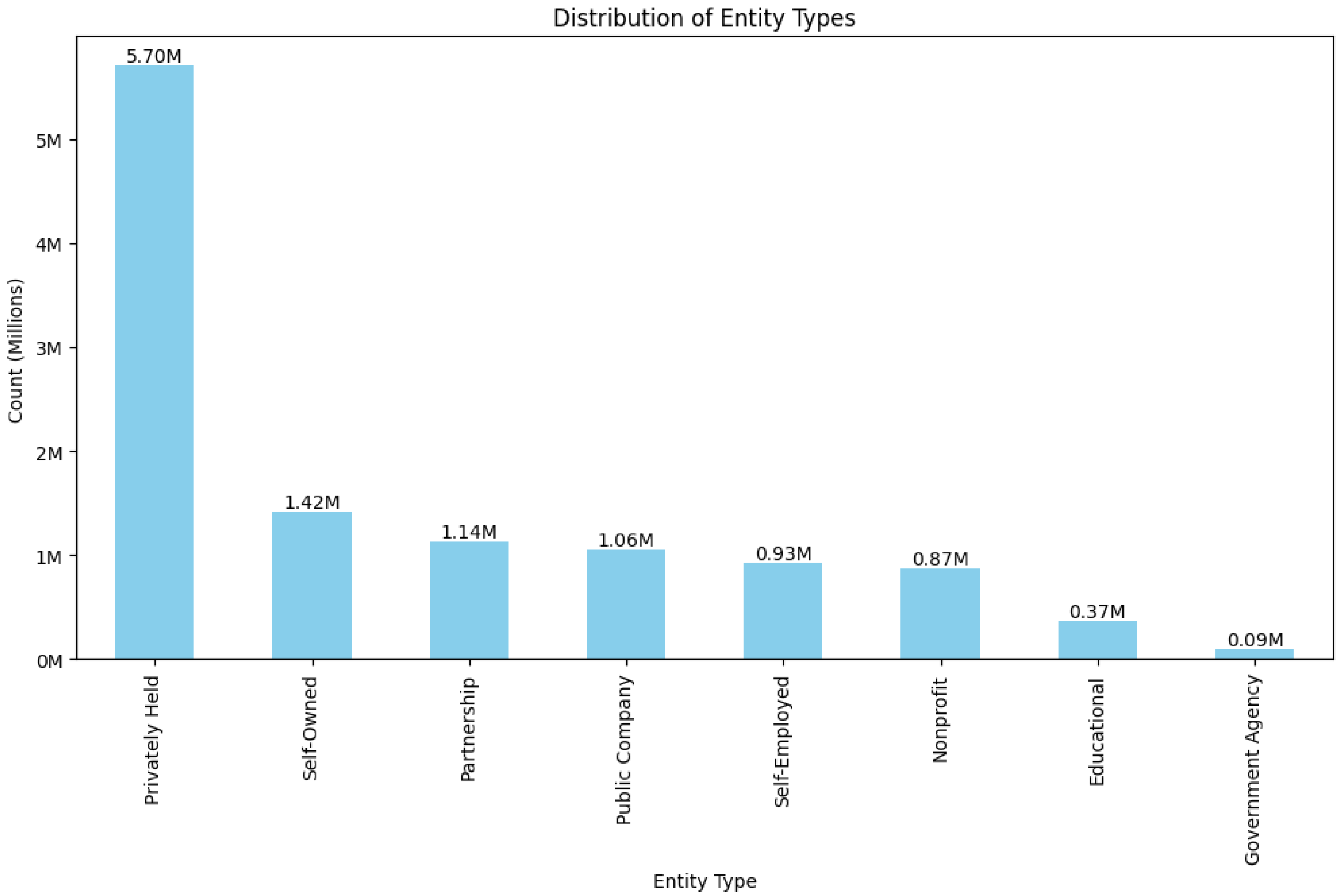


4. Distribution of Entity Types

In [12]:

```
entity_types = df['type'].dropna()
```

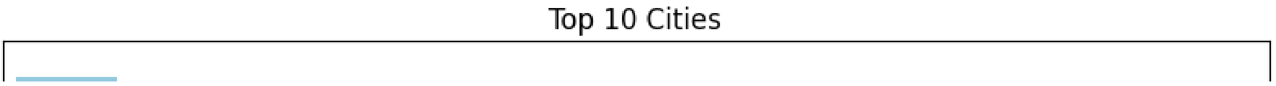
```
# Count the occurrences of each entity type
type_counts = entity_types.value_counts()

# Plot a bar chart to visualize the distribution of entity types with counts in millions
plt.figure(figsize=(12, 6))
ax = type_counts.plot(kind='bar', color='skyblue')

# Display the count values on the bars in millions
for index, value in enumerate(type_counts.values):
    plt.text(index, value + 0.1, f'{value / 1e6:.2f}M', ha='center', va='bottom', fontsize=10)

# Format y-axis to show values in millions
ax.yaxis.set_major_formatter(FuncFormatter(lambda x, _: f'{x / 1e6:.0f}M'))

plt.title('Distribution of Entity Types')
plt.xlabel('Entity Type')
plt.ylabel('Count (Millions)')
plt.show()
```

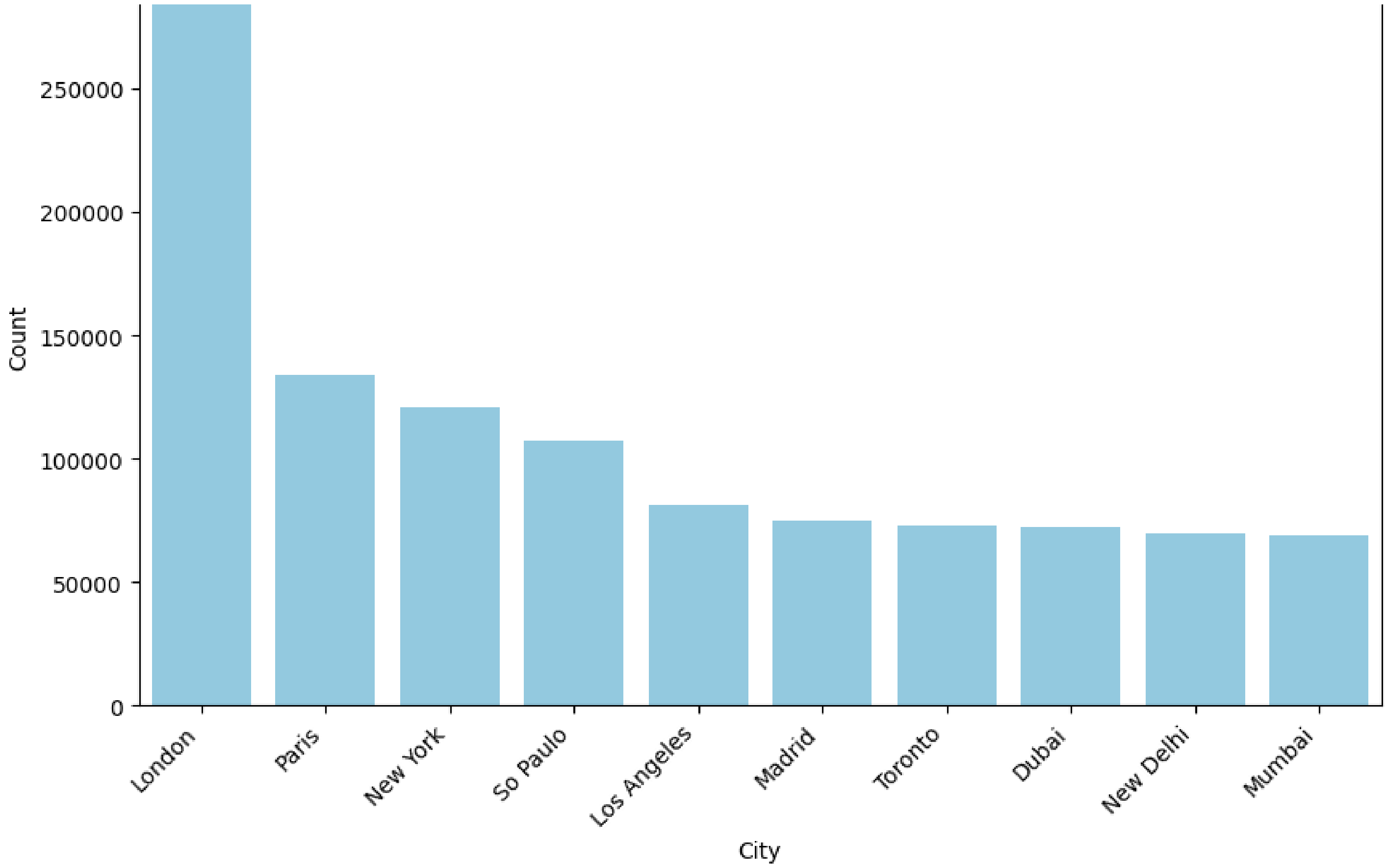


5. Geographical Analysis

In [13]:

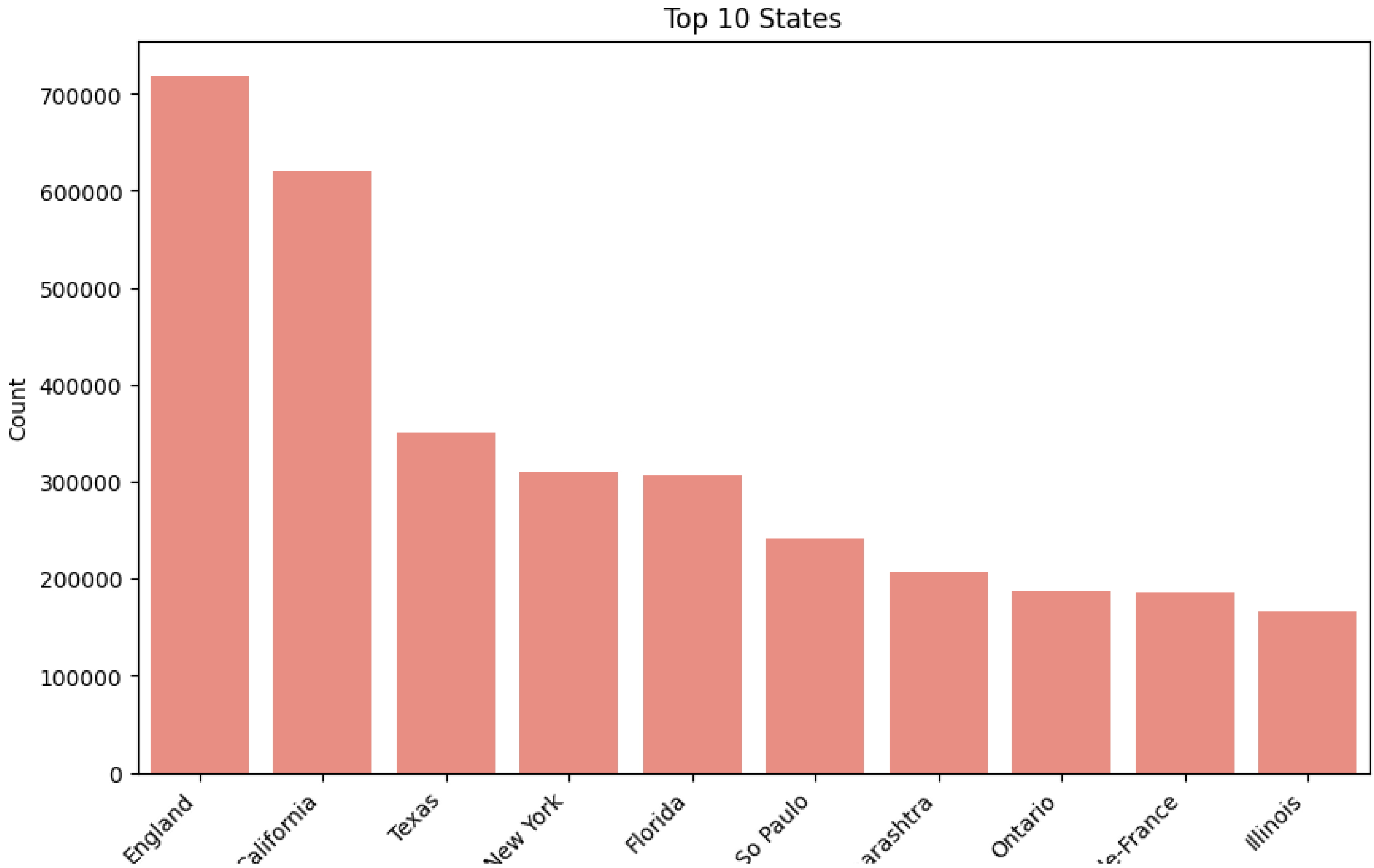
```
cities_distribution = df['city'].value_counts().head(10)

# Plot the distribution of entities across cities
plt.figure(figsize=(10, 6))
sns.barplot(x=cities_distribution.index, y=cities_distribution.values, color='skyblue')
plt.title('Top 10 Cities')
plt.xlabel('City')
plt.ylabel('Count')
plt.xticks(rotation=45, ha='right')
plt.show()
```





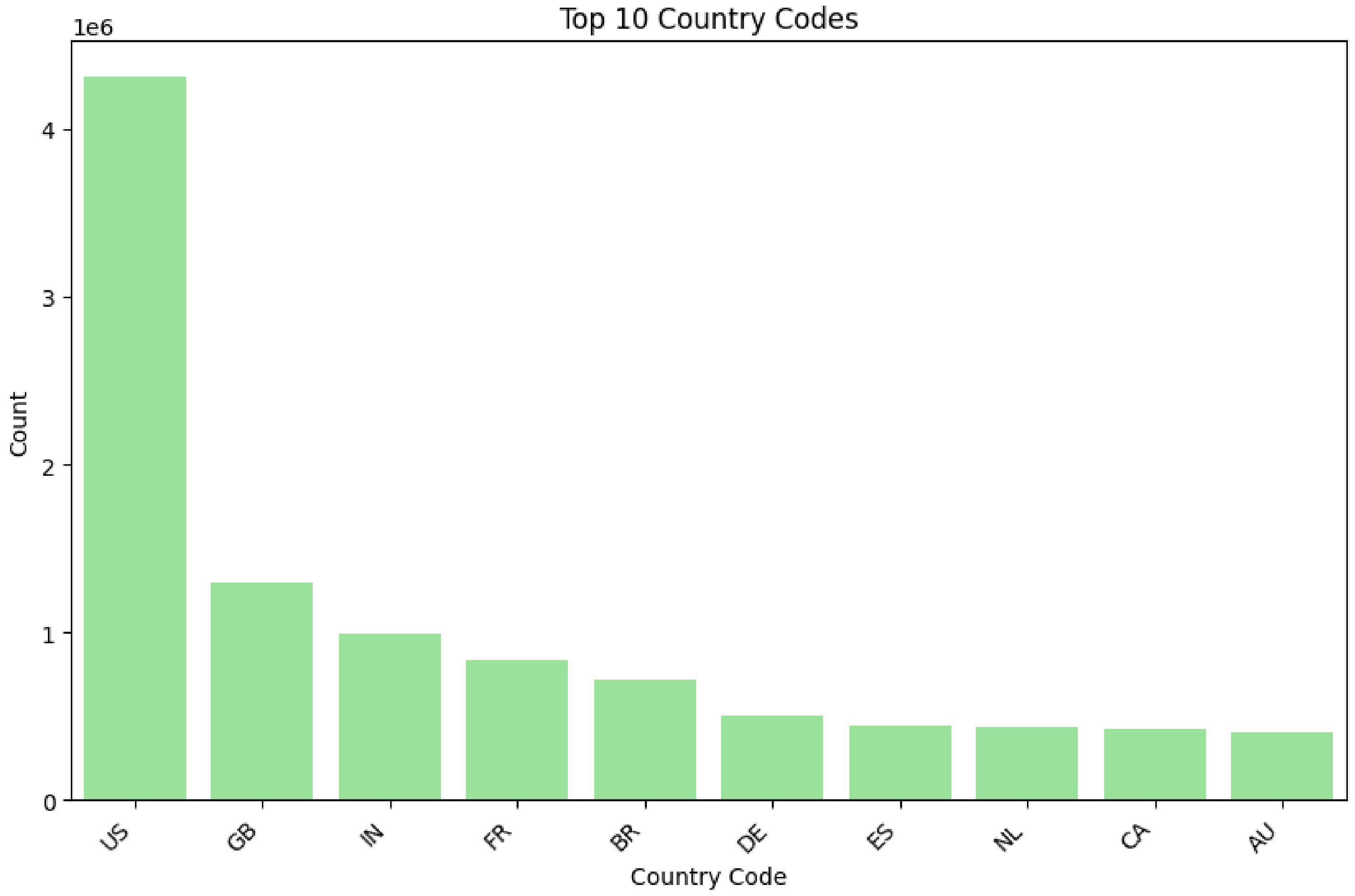
In [14]:

```
states_distribution = df['state'].value_counts().head(10)

# Plot the distribution of entities across states
plt.figure(figsize=(10, 6))
sns.barplot(x=states_distribution.index, y=states_distribution.values, color='salmon')
plt.title('Top 10 States')
plt.xlabel('State')
plt.ylabel('Count')
plt.xticks(rotation=45, ha='right')
plt.show()
```



In [15]:

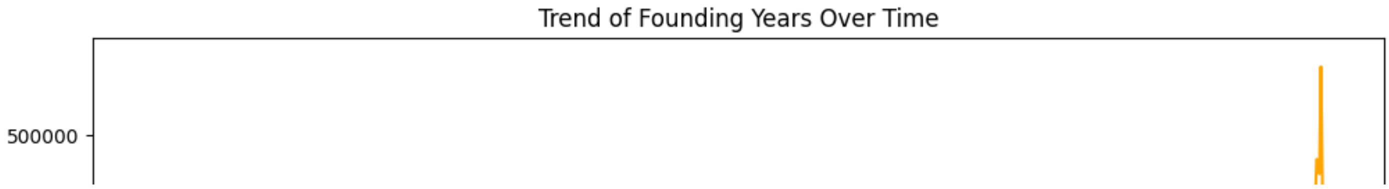
```
countries_distribution = df['country_code'].value_counts().head(10)

# Plot the distribution of entities across country codes
plt.figure(figsize=(10, 6))
sns.barplot(x=countries_distribution.index, y=countries_distribution.values, color='ligh
tgreen')
plt.title('Top 10 Country Codes')
plt.xlabel('Country Code')
plt.ylabel('Count')
plt.xticks(rotation=45, ha='right')
plt.show()
```

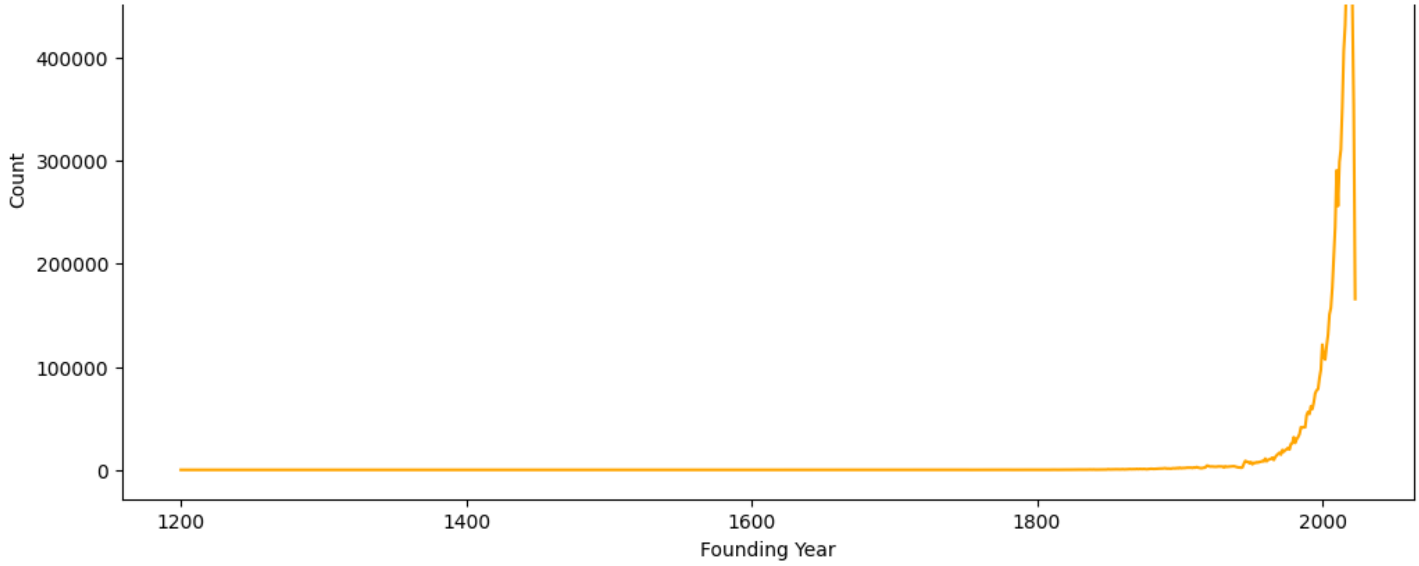


6. Trend of founding year over Time

In [16]:

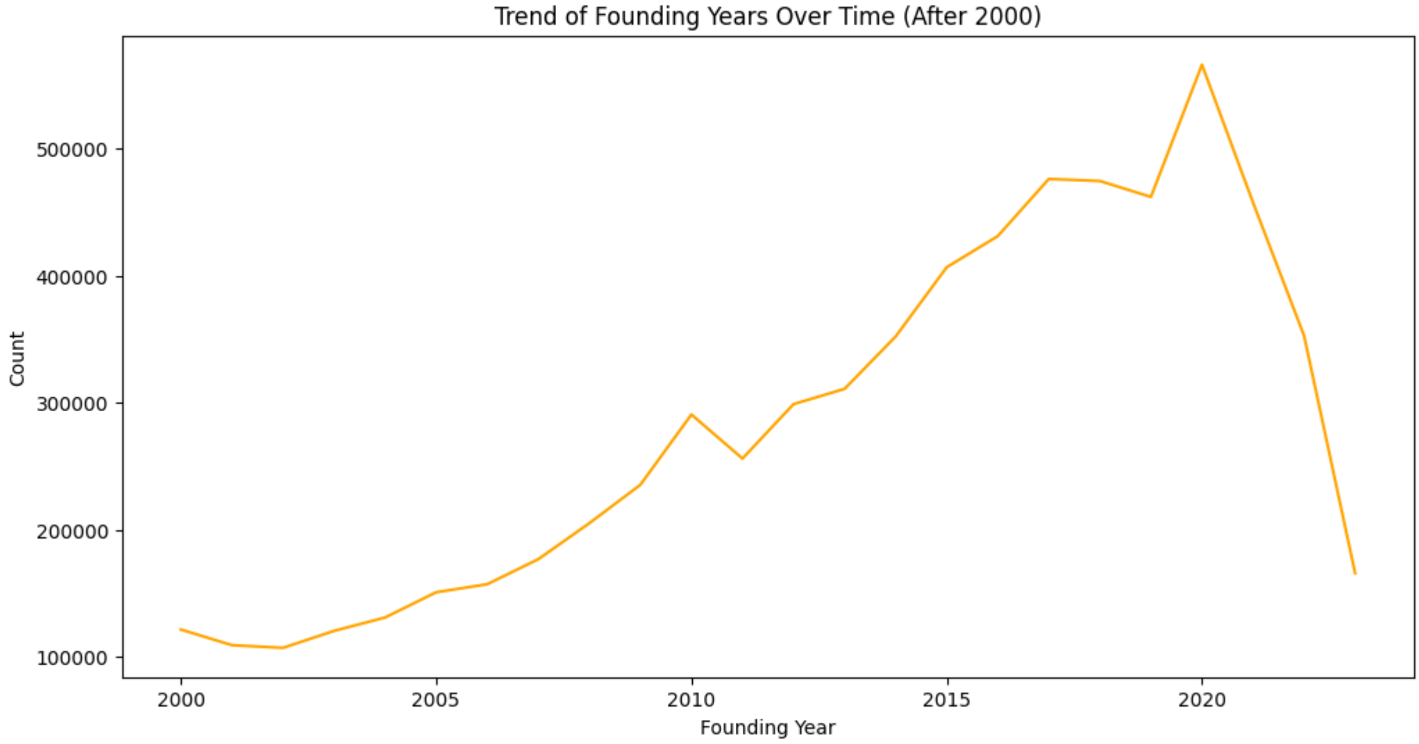
```
# Group by founding year and calculate counts
founding_year_trends = df['founded'].dropna().astype(int).value_counts().sort_index()

# Plot the trend of founding years over time
plt.figure(figsize=(12, 6))
sns.lineplot(x=founding_year_trends.index, y=founding_year_trends.values, color='orange')
plt.title('Trend of Founding Years Over Time')
plt.xlabel('Founding Year')
plt.ylabel('Count')
plt.show()
```





In [17]:

```
founding_years = df['founded'].dropna()

# Filter data for entities founded after 2000
founding_years_after_2000 = founding_years[founding_years >= 2000]

# Group by founding year and calculate counts for entities founded after 2000
founding_year_trends_after_2000 = founding_years_after_2000.astype(int).value_counts().s
ort_index()

# Plot the trend of founding years over time (after 2000)
plt.figure(figsize=(12, 6))
sns.lineplot(x=founding_year_trends_after_2000.index, y=founding_year_trends_after_2000.v
alues, color='orange')
plt.title('Trend of Founding Years Over Time (After 2000)')
plt.xlabel('Founding Year')
plt.ylabel('Count')
plt.show()
```



7. Global Company Distribution by Country

In [18]:

```
# converting iso2 to iso3 country codes because choropleth does not support iso2 code
```

```
iso2_to_iso3 = {
    'US': 'USA', 'GB': 'GBR', 'IN': 'IND', 'FR': 'FRA', 'BR': 'BRA',
    'DE': 'DEU', 'ES': 'ESP', 'NL': 'NLD', 'CA': 'CAN', 'AU': 'AUS',
    'IT': 'ITA', 'CN': 'CHN', 'BE': 'BEL', 'TR': 'TUR', 'ZA': 'ZAF',
    'MX': 'MEX', 'CH': 'CHE', 'AE': 'ARE', 'PL': 'POL', 'ID': 'IDN',
    'AR': 'ARG', 'SE': 'SWE', 'PT': 'PRT', 'PK': 'PAK', 'DK': 'DNK',
    'CO': 'COL', 'NG': 'NGA', 'SG': 'SGP', 'PE': 'PER', 'CL': 'CHL',
    'NO': 'NOR', 'NZ': 'NZL', 'IE': 'IRL', 'AT': 'AUT', 'MY': 'MYS',
    'EG': 'EGY', 'BD': 'BGD', 'IR': 'IRN', 'FI': 'FIN', 'CZ': 'CZE',
    'PH': 'PHL', 'RO': 'ROU', 'IL': 'ISR', 'SA': 'SAU', 'JP': 'JPN',
    'HK': 'HKG', 'VN': 'VNM', 'KE': 'KEN', 'GR': 'GRC', 'UA': 'UKR',
    'HU': 'HUN', 'RU': 'RUS', 'EC': 'ECU', 'LK': 'LKA', 'TH': 'THA',
    'BG': 'BGR', 'RS': 'SRB', 'KR': 'KOR', 'LT': 'LTU', 'HR': 'HRV',
    'GH': 'GHA', 'TW': 'TWN', 'TN': 'TUN', 'SK': 'SVK', 'EE': 'EST',
    'MA': 'MAR', 'UY': 'URY', 'JO': 'JOR', 'CY': 'CYP', 'VE': 'VEN',
    'NP': 'NPL', 'LU': 'LUX', 'SI': 'SVN', 'DZ': 'DZA', 'QA': 'QAT',
    'LB': 'LBN', 'GT': 'GTM', 'LV': 'LVA', 'GE': 'GEO', 'SN': 'SEN',
    'CR': 'CRI', 'DO': 'DOM', 'CI': 'CIV', 'UG': 'UGA', 'KW': 'KWT',
    'TZ': 'TZA', 'ZW': 'ZWE', 'IQ': 'IRQ', 'KH': 'KHM', 'PR': 'PRI',
    'AM': 'ARM', 'CM': 'CMR', 'AO': 'AGO', 'MU': 'MUS', 'AZ': 'AZE',
    'OM': 'OMN', 'PA': 'PAN', 'KZ': 'KAZ', 'BA': 'BIH', 'MM': 'MMR',
    'MK': 'MKD', 'ET': 'ETH', 'ZM': 'ZMB', 'PY': 'PRY', 'SV': 'SLV',
    'MZ': 'MOZ', 'BY': 'BLR', 'CD': 'COD', 'BO': 'BOL', 'TT': 'TTO',
    'IS': 'ISL', 'JM': 'JAM', 'HN': 'HND', 'RE': 'REU', 'BH': 'BHR',
    'AL': 'ALB', 'AF': 'AFG', 'MG': 'MDG', 'BJ': 'BEN', 'MT': 'MLT',
    'UZ': 'UZB', 'MD': 'MDA', 'RW': 'RWA', 'SD': 'SDN', 'BW': 'BWA',
    'MC': 'MCO', 'NI': 'NIC', 'BF': 'BFA', 'LY': 'LBY', 'MV': 'MDV',
    'PG': 'PNG', 'TG': 'TGO', 'PS': 'PSE', 'MW': 'MWI', 'CG': 'COG',
    'SY': 'SYR', 'MQ': 'MTQ', 'GP': 'GLP', 'GN': 'GIN', 'ML': 'MLI',
    'LI': 'LIE', 'AD': 'AND', 'IM': 'IMN', 'GA': 'GAB', 'CW': 'CUW',
    'GI': 'GIB', 'YE': 'YEM', 'HT': 'HTI', 'BM': 'BMU', 'MN': 'MNG',
    'FJ': 'FJI', 'VG': 'VGB', 'ME': 'MNE', 'BS': 'BHS', 'KY': 'CYM',
    'SR': 'SUR', 'CU': 'CUB', 'TJ': 'TJK', 'PF': 'PYF', 'SZ': 'SWZ',
    'LR': 'LBR', 'SL': 'SLE', 'KG': 'KGZ', 'SM': 'SMR', 'AW': 'ABW',
    'BB': 'BRB', 'BZ': 'BLZ', 'GG': 'GGY', 'GY': 'GUY', 'SO': 'SOM',
    'GF': 'GUF', 'GM': 'GMB', 'VI': 'VIR', 'LS': 'LSO', 'MR': 'MRT',
    'TD': 'TCD', 'BN': 'BRN', 'NE': 'NER', 'SS': 'SSD', 'FO': 'FRO',
    'JE': 'JEY', 'BT': 'BTN', 'BI': 'BDI', 'DJ': 'DJI', 'TM': 'TKM',
    'LC': 'LCA', 'NC': 'NCL', 'VU': 'VUT', 'YT': 'MYT', 'GU': 'GUM',
    'SC': 'SYC', 'GD': 'GRD', 'GL': 'GRL', 'LA': 'LAO', 'GQ': 'GNQ',
    'TC': 'TCA', 'VC': 'VCT', 'CV': 'CPV', 'AX': 'ALA', 'MO': 'MAC',
    'BQ': 'BES', 'AG': 'ATG', 'CF': 'CAF', 'SX': 'SXM', 'DM': 'DMA',
    'AI': 'AIA', 'TL': 'TLS', 'KM': 'COM', 'KN': 'KNA', 'MH': 'MHL',
    'GW': 'GNB', 'TUV': 'TUV', 'SB': 'SLB', 'MP': 'MNP', 'CK': 'COK', 'WS': 'WSM', 'USA'
: 'USA', 'MF': 'MAF',
    'PW': 'PLW', 'BL': 'BLM', 'FM': 'FSM', 'ST': 'STP', 'FK': 'FLK', 'IO': 'IOT',
    'WF': 'WLF', 'TF': 'ATF', 'ER': 'ERI', 'KP': 'PRK', 'AS': 'ASM', 'TO': 'TON',
    'PM': 'SPM', 'KI': 'KIR', 'MNE': 'MNE', 'AZE': 'AZE', 'CHE': 'CHE', 'SJ': 'SJM',
    'CX': 'CXR', 'CYM': 'CYM', 'MS': 'MSR', 'VA': 'VAT', 'BLR': 'BLR', 'IND': 'IND',
    'CAN': 'CAN', 'SH': 'SHN', 'NF': 'NFK', 'TK': 'TKL', 'AQ': 'ATA', 'SXM': 'SXM',
    'BGD': 'BGD', 'XK': 'XKX', 'MLT': 'MLT', 'MKD': 'MKD', 'AND': 'AND', 'COL': 'COL',
    'PAN': 'PAN', 'ISR': 'ISR', 'NU': 'NIU', 'UM': 'UMI', 'JOR': 'JOR', 'KEN': 'KEN',
    'MDA': 'MDA', 'NOR': 'NOR', 'MNG': 'MNG', 'SRB': 'SRB', 'MAC': 'MAC', 'CC': 'CCK',
    'PER': 'PER', 'MAR': 'MAR', 'GEO': 'GEO', 'NR': 'NRU', 'EH': 'ESH'
}
```

In [19]:

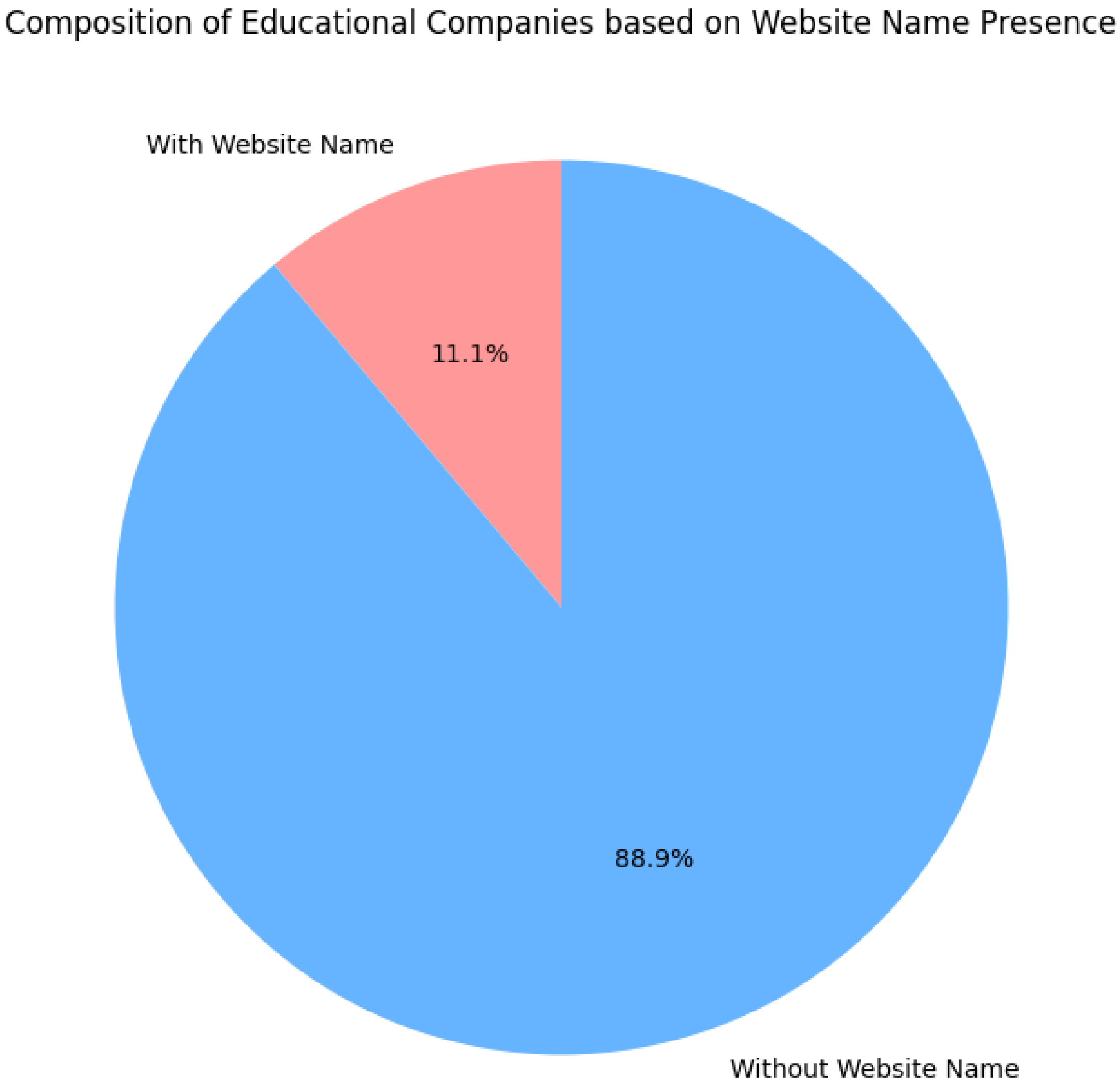
```
df['country_code_iso3'] = df['country_code'].map(iso2_to_iso3)

# Group by country and calculate the count of companies
country_counts = df.groupby('country_code_iso3').size().reset_index(name='company_count'
)

# Use the 'country_code_iso3' column for visualization
fig = px.choropleth(country_counts,
                    locations='country_code_iso3',
                    color='company_count',
                    hover_name='country_code_iso3',
                    title='Global Company Distribution by Country',
                    color_continuous_scale="YlOrRd",
                    projection='natural earth',  # Changed to a different projection
                    locationmode='ISO-3',
                    range_color=(0, 20),
                    template='plotly_dark'  # Dark template for a modern look
                   )

fig.update_geos(
    showcoastlines=True, coastlinecolor="white", showland=True, landcolor="black"
)

fig.update_layout(
    margin={"r":0,"t":40,"l":0,"b":0},
    geo=dict(bgcolor='rgba(0,0,0,0)'),
)

fig.show()
```

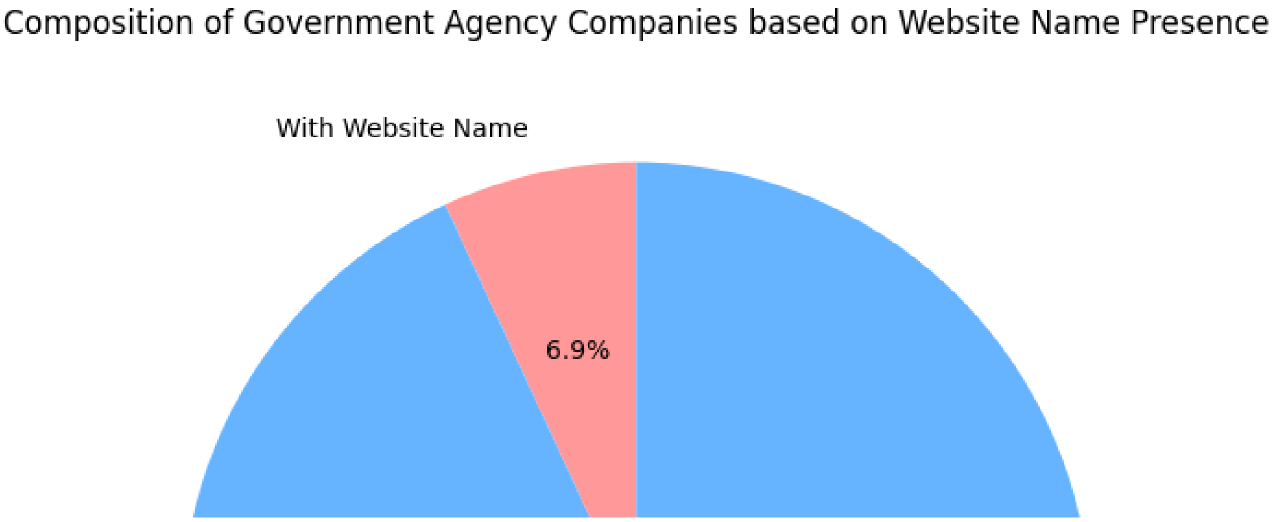
8. Online Presence

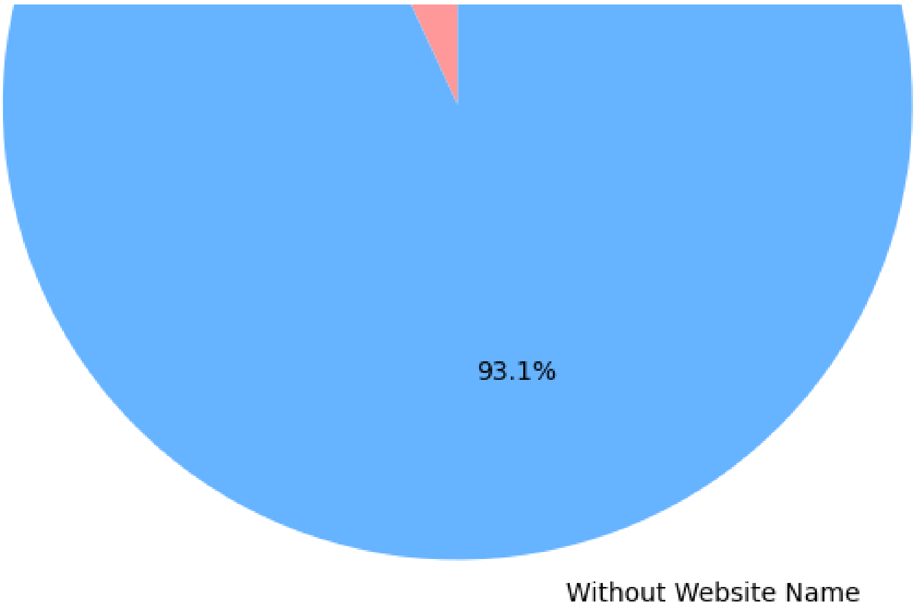
In [20]:

```
# Group by 'type' and calculate the count of companies with and without a website name
composition_df = df.groupby(['type', df['website'].notna()]).size().unstack(fill_value=0
)

# Reset the index to ensure 'type' is a regular column
composition_df = composition_df.reset_index()

# Rename the columns for better clarity
composition_df.columns = ['type', 'with_website_name', 'without_website_name']

# Calculate the total count for each entity type
composition_df['total'] = composition_df['with_website_name'] + composition_df['without_w
ebsite_name']

# Plot pie charts for each entity type
entity_types = composition_df['type']
```

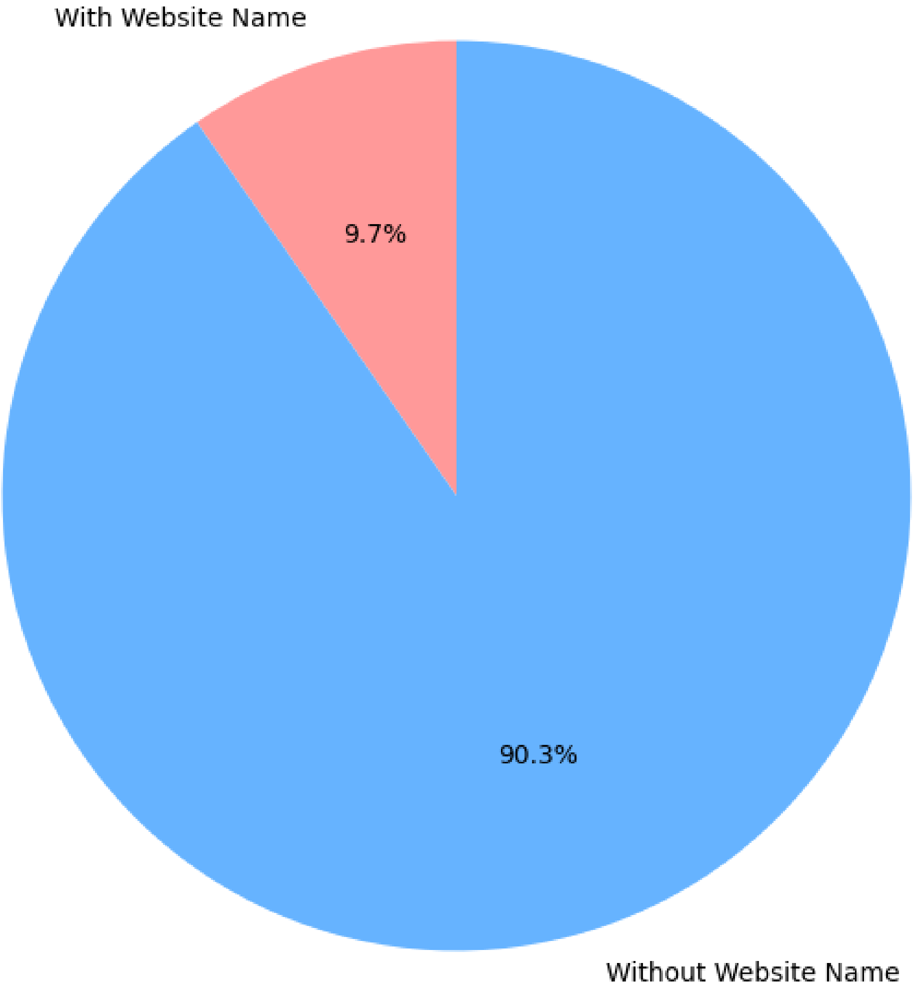
```
colors = ['#ff9999', '#66b3ff']

for entity_type in entity_types:
    labels = ['With Website Name', 'Without Website Name']
    sizes = composition_df.loc[composition_df['type'] == entity_type, ['with_website_nam
e', 'without_website_name']].values.flatten()
    total = sizes.sum()
    percentages = sizes / total * 100

    plt.figure(figsize=(8, 8))
    plt.pie(sizes, labels=labels, autopct=lambda p: '{:.1f}%'.format(p) if p > 0 else ''
, colors=colors, startangle=90)
    plt.title(f'Composition of {entity_type} Companies based on Website Name Presence')
    plt.show()
```



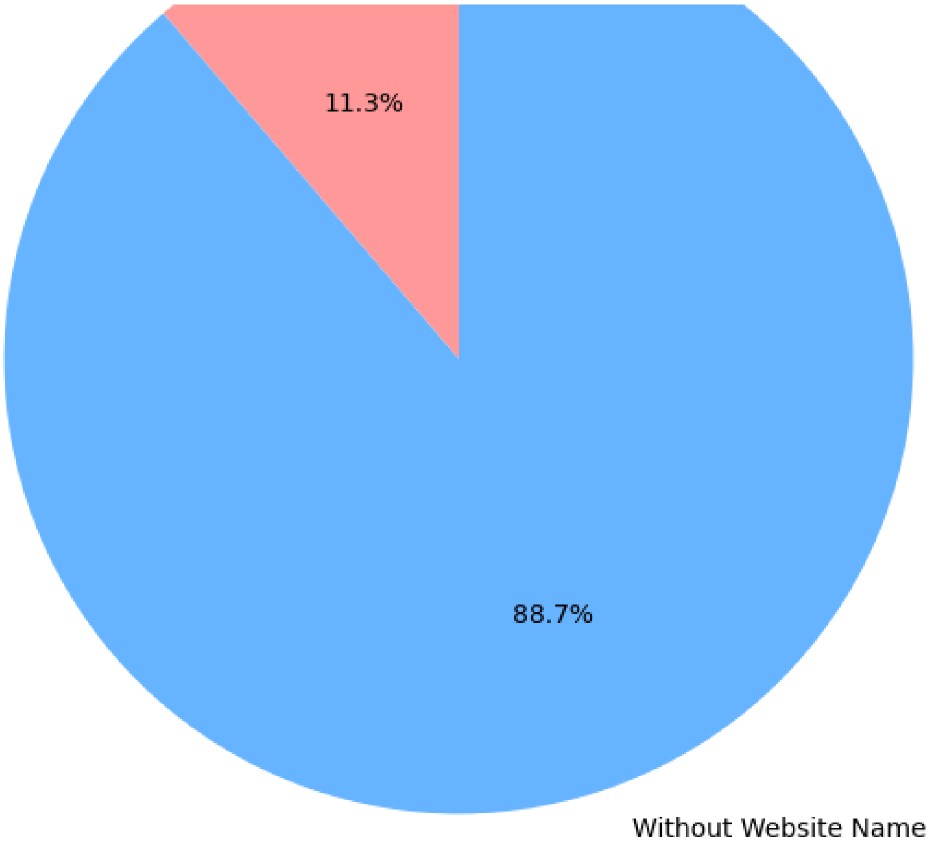




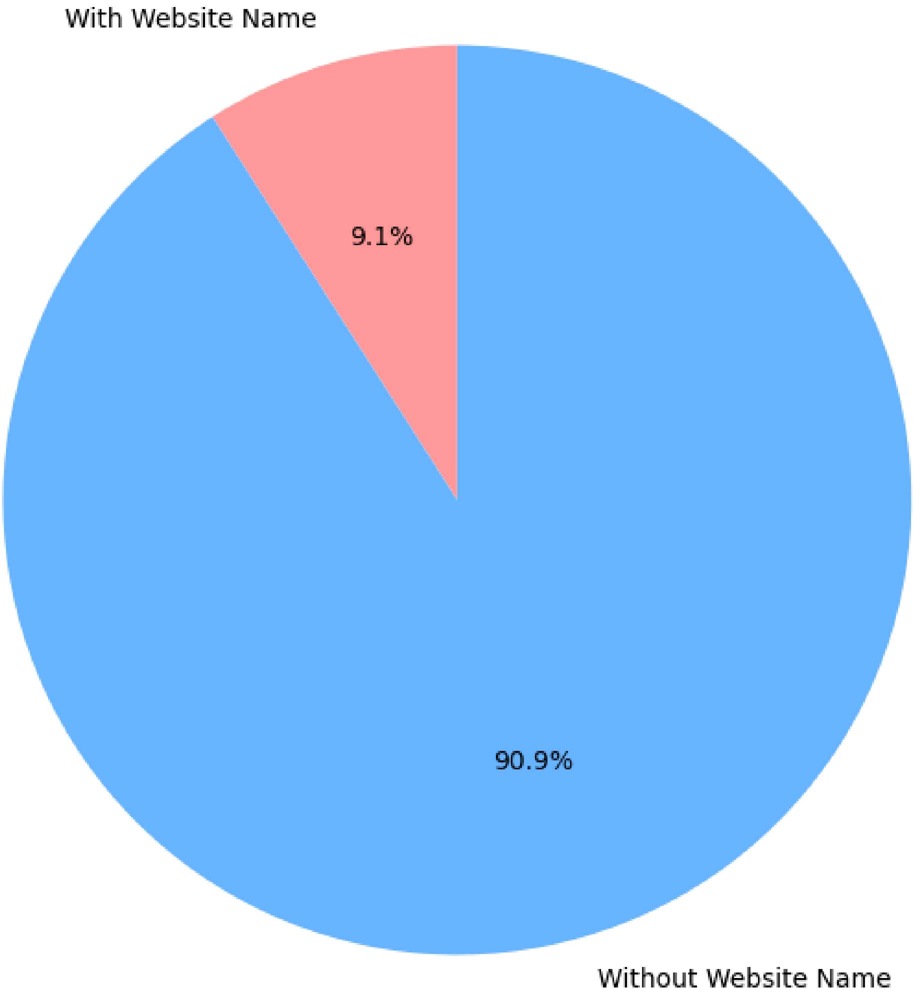
Composition of Nonprofit Companies based on Website Name Presence



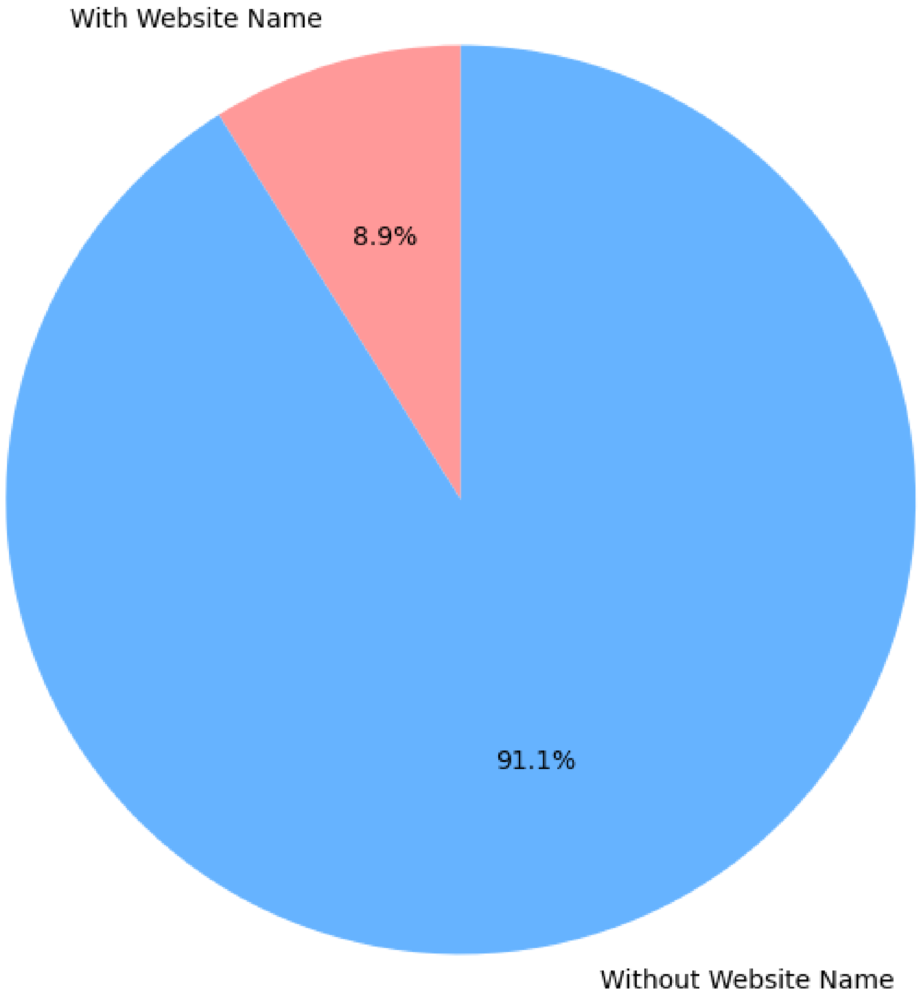
Composition of Partnership Companies based on Website Name Presence



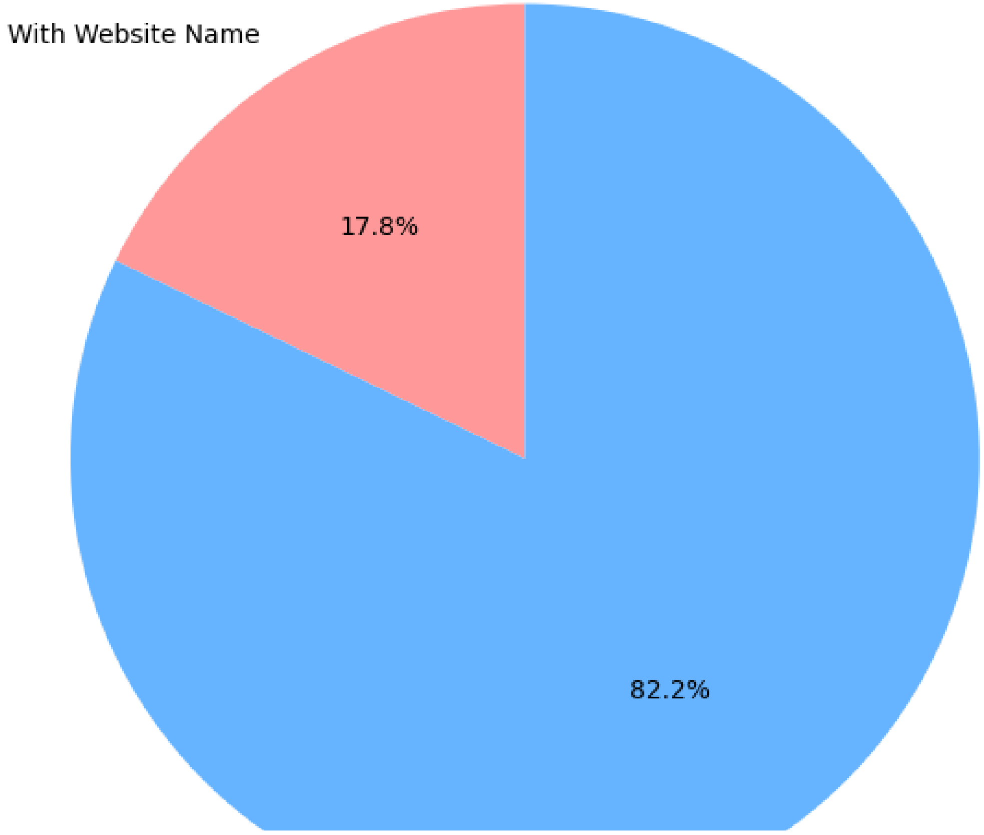
Composition of Privately Held Companies based on Website Name Presence

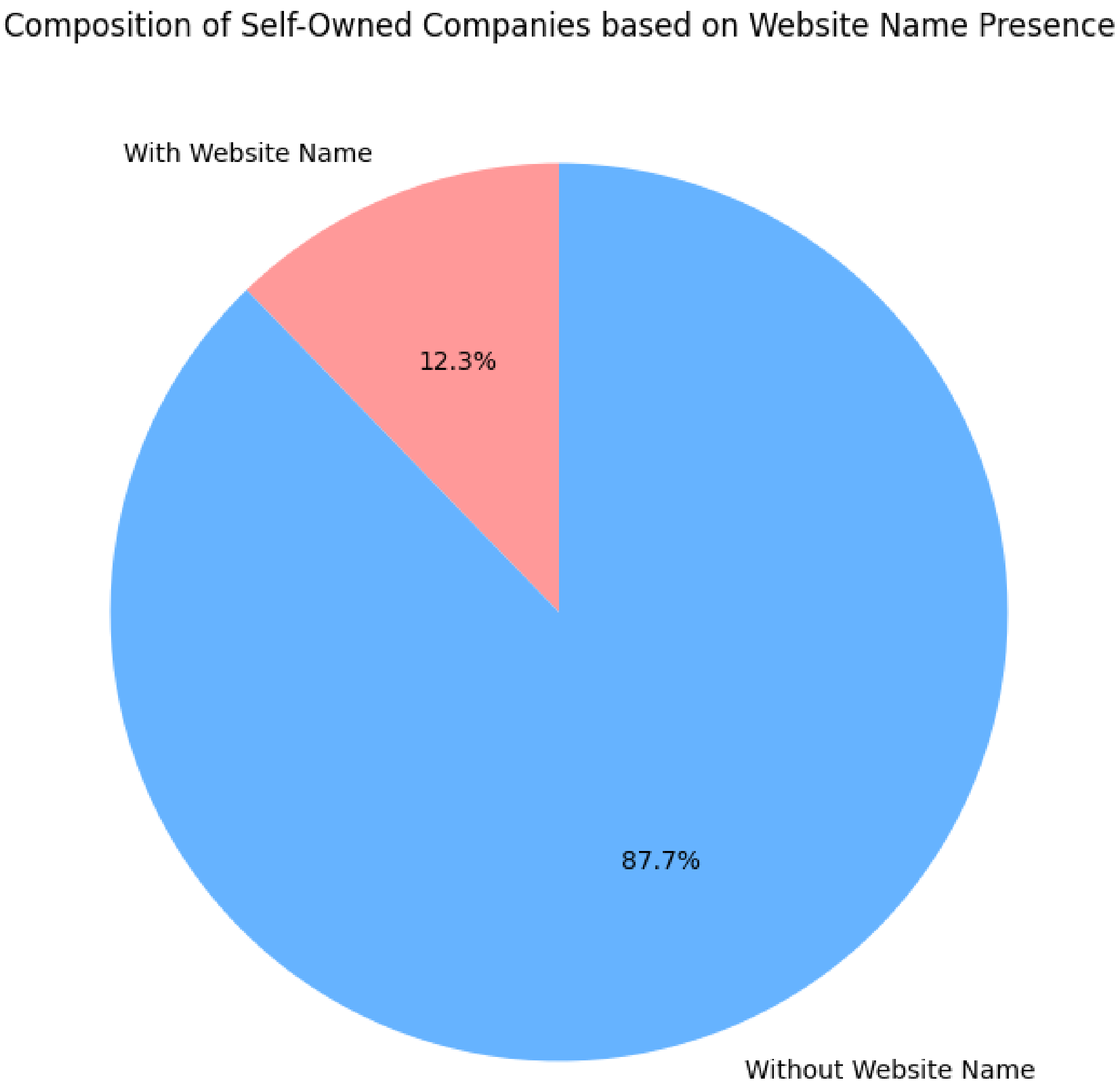


Composition of Public Company Companies based on Website Name Presence



Composition of Self-Employed Companies based on Website Name Presence

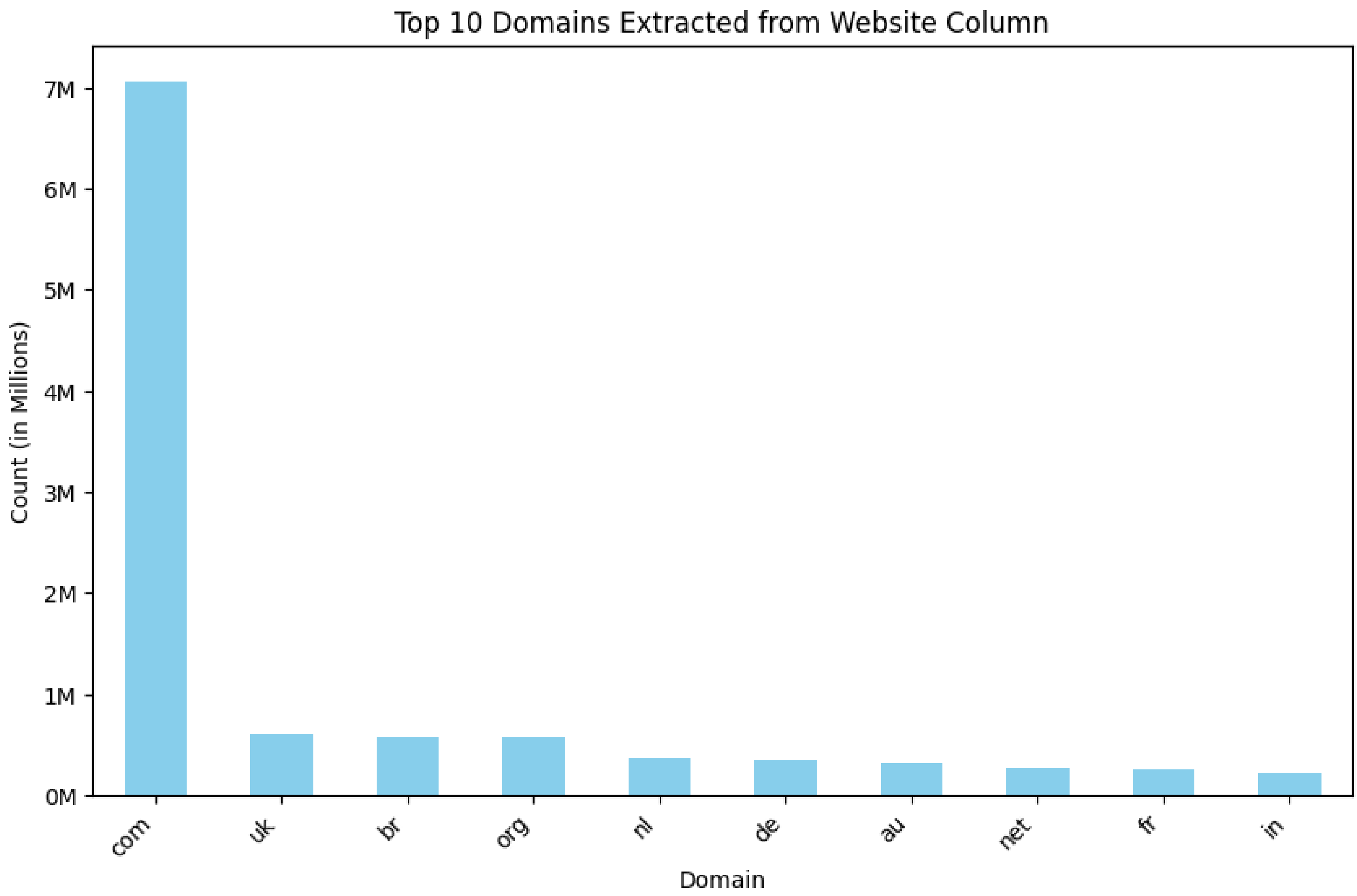




9. Top 10 domains used

In [22]:

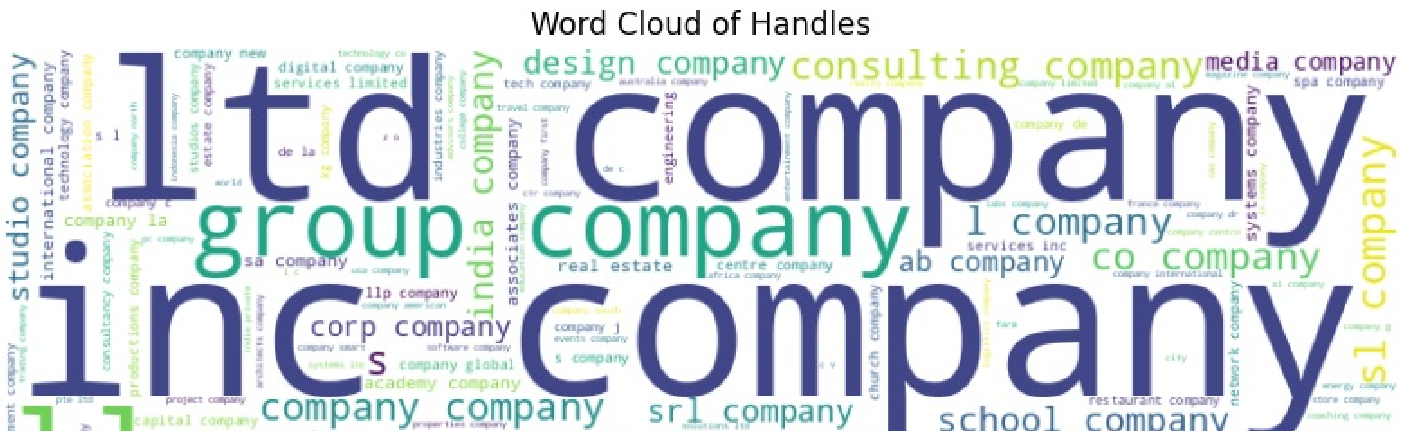
```
# Extract domains from the 'website' column
df['domain'] = df['website'].str.split('.').str[-1]

# Count the occurrences of each domain
top_domains = df['domain'].value_counts().head(10)

# Plot the top 10 domains
plt.figure(figsize=(10, 6))
top_domains.plot(kind='bar', color='skyblue')

# Format y-axis labels in millions
def millions_formatter(x, pos):
    return f'{x/1e6:.0f}M'

plt.gca().yaxis.set_major_formatter(FuncFormatter(millions_formatter))

plt.title('Top 10 Domains Extracted from Website Column')
plt.xlabel('Domain')
plt.ylabel('Count (in Millions)')
plt.xticks(rotation=45, ha='right')
plt.show()
```

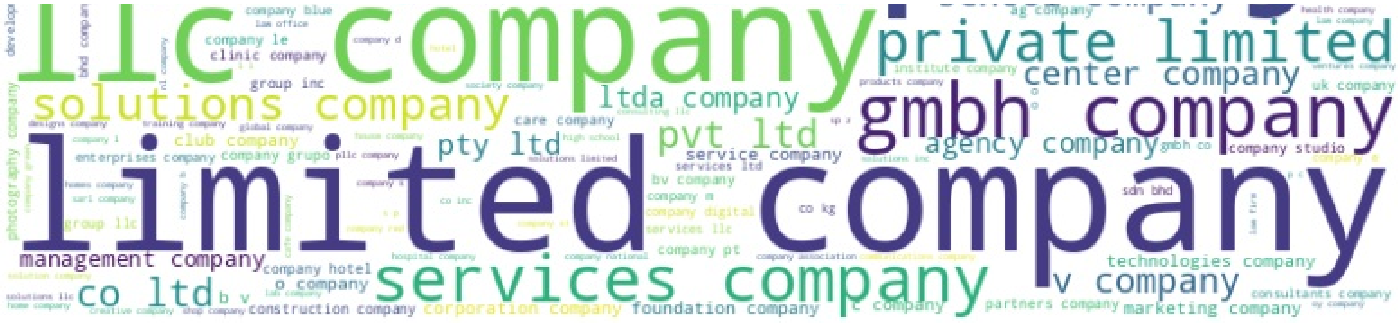


10. Handles Word cloud

In [6]:

```
# Sample a fraction of the data
sampled_df = df.sample(frac=0.4, random_state=42)  # 10% of the data

# Combine all handles into a single string
all_handles = ' '.join(sampled_df['handle'].dropna())

# Generate a word cloud
wordcloud = WordCloud(width=800, height=400, background_color='white').generate(all_handl
es)

# Plot the word cloud
plt.figure(figsize=(10, 6))
plt.imshow(wordcloud, interpolation='bilinear')
plt.axis('off')
plt.title('Word Cloud of Handles')
plt.show()
```





Conlusion

Thank you for accompanying me through this enlightening journey of exploratory data analysis (EDA). Even though I have only scratched the surface of the dataset's potential, I have gained the insights I sought. This exploration has bestowed upon me valuable knowledge and answered the questions that plagued my mind. While there are numerous other possible conclusions and analyses, I have decided to end my EDA here.

I trust that you found my notebook engaging and, more importantly, beneficial. I welcome any feedback you may have, and I assure you that I read and respond to each one with utmost sincerity.

I wish you the best of luck in your endeavors!

In [ ]:

```

```