SPARKS FUND

INVESTMENT CASE STUDY GROUP SUBMISSION

Date: 06-May-2018

Team:

- **Manjula Raman**
- **Srinivas Panganamala**
- **Greenu Sharma**
- **Vishnu Das**

Abstract

Sparks Funds is an asset management company that wants to study Global trends in investment and take investment decisions based on the trends

We have been provided with data of

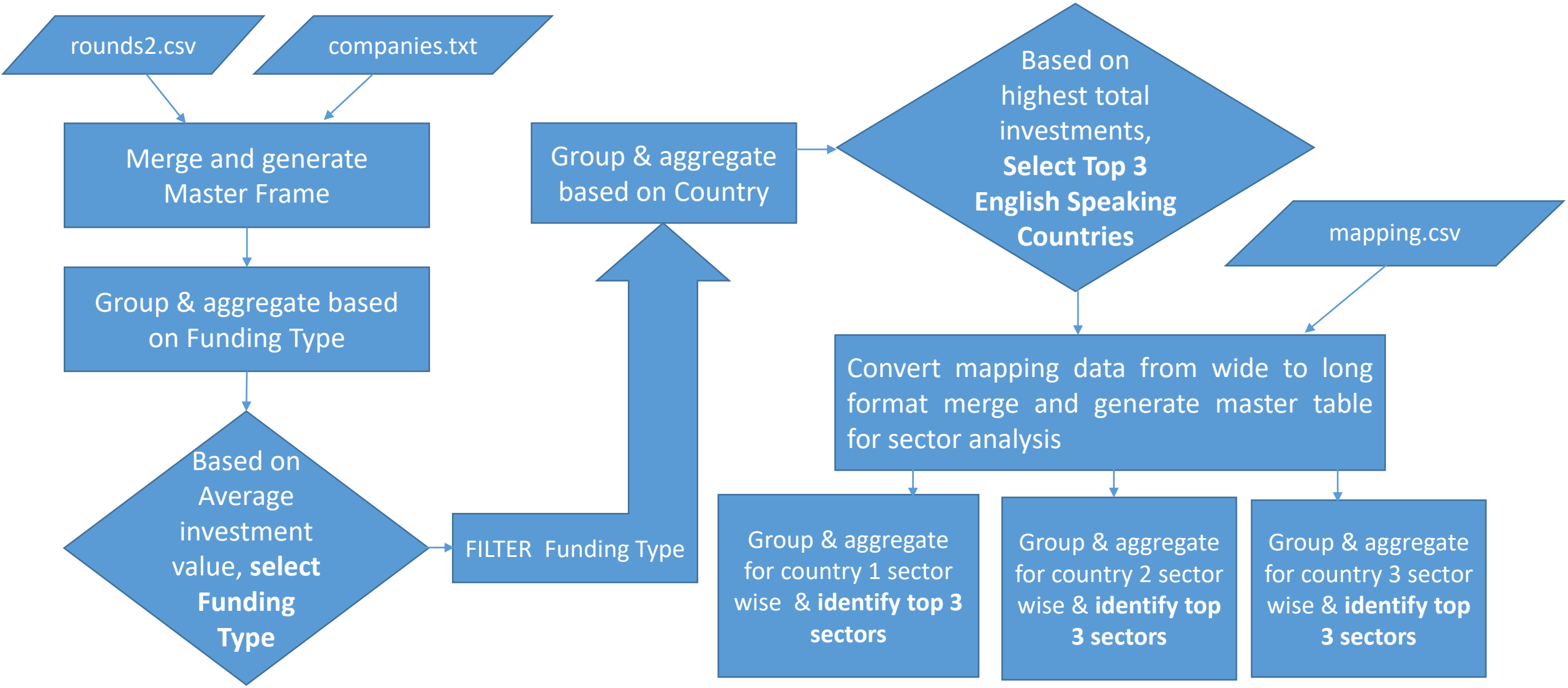
- Companies in which investors invest
- Amounts invested
- Type of funding and
- Sectors in which the companies operate

We have been told by Sparks funds that it prefers to invest in

1) **English Speaking** countries
2) Range of amounts between **5M and 15M USD**

Objective: The aim of this study is to analyse the data and give investment guidance to Sparks Funds

Problem Solving Methodology



Analysis

Data Cleaning

Step1 : Data Understanding

3 Tables were provided to us

- **Fact Table – rounds2**

  The main fact variable was the column "***raised_amount_usd***", Primary key : ***company_permalink***

- **Dimension Tables**

  1)companies.txt : Primary key *: permalink*

  2)mapping.csv : Primary key : *category_list*

Description of Companies Table

Attribute	Description
Permalink	Unique ID of company

Description of rounds2 Table

Attributes	Description
company_permalink	Unique ID of company

Step2: Merging the 'rounds2' with 'companies' to get master_frame

- Here, we had to convert the 2 columns *company_permalink* and *permalink* to lower case in order to merge
  - companies$permalink <- str_to_lower(companies$permalink)
  - rounds2$company_permalink <- str_to_lower(rounds2$company_permalink)

  After merging, Number of observation= 114949

- After removing the null/NA values in the *raised_amount_used* column
  - master_frame <- master_frame[!(master_frame$raised_amount_usd == "" | is.na(master_frame$raised_amount_usd)),]

  Number of observations=94959

  Unique companies in rounds2 & companies file = 66368

Analysis

Funding Type

Step 3: Choice of best funding type based on the average value of investments

After grouping based on funding type & aggregating the average funding value, private equity funding turned out have the highest funding, but the funding type most suitable for Spark investments is '**venture**' because their average investment amount is 11.75M USD that is within 5M-15M USD range preferred by Spark

- *funding_round_type_group<-group_by(master_frame,funding_round_type)*
- *summarise(funding_round_type_group,mean(raised_amount_usd,na.rm=T))*

	funding_round_type	FundAverage
1	private_equity	73308593.0
2	venture	11749083.5
3	angel	958694.5
4	seed	719818.0

Analysis

Top Countries

Step4 :Country analysis after filtering investment type

First filtering based on the funding type, grouping by country code and aggregating the sum of investments, top9 countries were derived.
Note: Here there were countries with blank and NA country codes

```
venture_country_summary <- venture_country_summary[!(venture_country_summary$country_code == "" | is.na(venture_country_summary$country_code)), ]
```

By manually searching from English Speaking Country List provided , the

Top 3 English speaking countries were selected:

- ✓ **USA**
- ✓ **GBR**
- ✓ **IND**

	country_code	TotalInvestment
1	USA	422510842796
2	CHN	39835418773
3	GBR	20245627416
4	IND	14391858718
5	CAN	9583332317
6	FRA	7259536732
7	ISR	6907514579
8	DEU	6346959822
9	JPN	3363676611

Analysis

Sectors

Step 5: Sector Mapping

- ***"Mapping.csv"*** dimension table was read in, converted from wide to long format

	category_list	Main_Sector
1	Adventure Travel	Automotive...Sports
2	Aerospace	Automotive...Sports
3	Auto	Automotive...Sports
4	Automated Kiosk	Automotive...Sports
5	Automotive	Automotive...Sports

- Primary sector column was generated in ***master_frame*** data frame by splitting the category_list at "|"

```
master_frame_primary_sector <-
separate(master_frame,category_list,c("primary_sector","other1","other2"),sep="\\|",extra="merge",fill="right")
```

- ***Master frame*** was merged to ***Mapping*** and NULL values removed

23	Air Pollution Control	Cleantech...Semiconductors
24	Aquaculture	Cleantech...Semiconductors
25	Bio-Pharm	Cleantech...Semiconductors

```
master_frame_mapped <- merge(master_frame_primary_sector,mapping,by.x="primary_sector",by.y="category_list")

master_frame_mapped <- master_frame_mapped[!(master_frame_mapped$raised_amount_usd == "" |
is.na(master_frame_mapped$raised_amount_usd)), ]
```

- After merging the table has **87190** observations

684	Social Television	Social..Finance..Analytics..Advertising
685	Social Travel	Social..Finance..Analytics..Advertising
686	Stock Exchanges	Social..Finance..Analytics..Advertising
687	Venture Capital	Social..Finance..Analytics..Advertising

Analysis

Sectors

Step 6: Country wise sector analysis

The table with sector mapped is filtered for Top 3 countries[USA,GBR,IND], grouped on main_sector

Eg:

```
D1 <- filter(master_frame_mapped_venture_5to15M,country_code=="USA")
D1_main_sector_group <- group_by(D1,main_sector)
D1_summary <-
summarise(D1_main_sector_group,total_number_of_investments=n(),total_amount_invested=sum(raised_amount_usd))
```

Top 3 sectors are derived and for each sector , top company is derived for Top 3 Countries

```
D1_others <- filter(D1,main_sector=="Others")
D1_others_group <- group_by(D1_others,permalink)
D1_others_summary <- summarise(D1_others_group,total_investment=sum(raised_amount_usd))
D1_others <- arrange(D1_others_summary,desc(total_investment))
D1_others[1, ]
```

Analysis

Sector-wise Investment

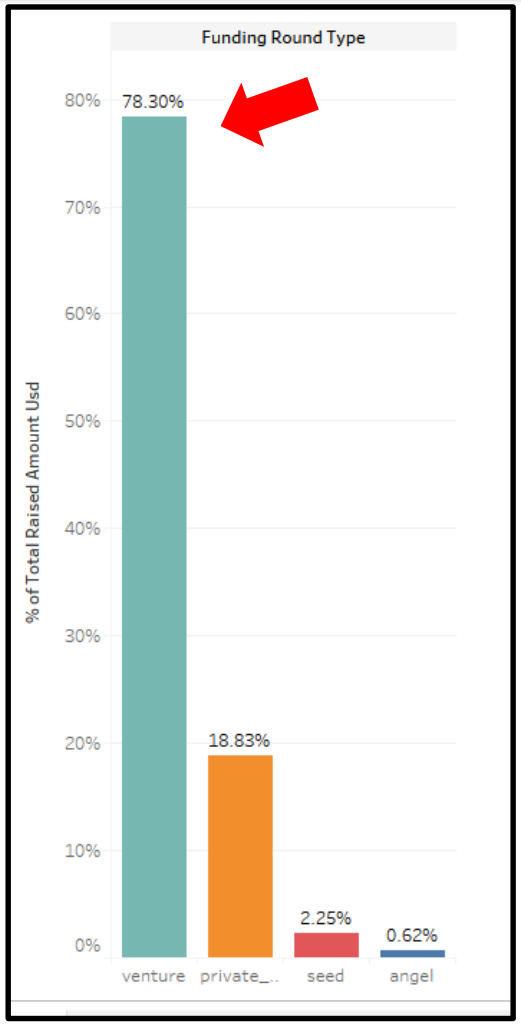
Top 3 Countries Sector wise Investment results

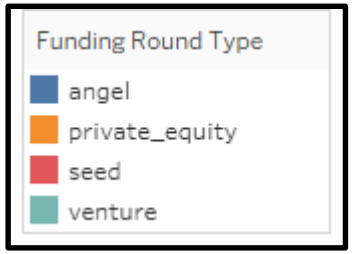
Sector-wise Investment Analysis				
Sl.no	**Questions**	**USA**	**GRB**	**IND**
1	Total number of Investments (count)	11149	577	299
2	Total amount of investment (USD)	99661524549	5028704358	2683537552
3	Top Sector name (no. of investment-wise)	Others	Others	Others
4	Second Sector name (no. of investment-wise)	Cleantech...Semiconductors	Cleantech...Semiconductors	News..Search.and.Messaging
5	Third Sector name (no. of investment-wise)	Social..Finance..Analytics..Adve	Social..Finance..Analytics..Advertising	Entertainment
6	Number of investments in top sector (3)	2923	143	109
7	Number of investments in second sector (4)	2297	127	52
8	Number of investments in third sector (5)	1912	98	33
9	For point 3 (top sector count-wise), which company received the highest investment?	/organization/virtustream	/organization/electric-cloud	/organization/firstcry-com
10	For point 4 (second best sector count-wise), which company received the highest investment?	/organization/biodesix	/organization/eusa-pharma	/organization/gupshup-technology-india-pvt-ltd

PLOTS

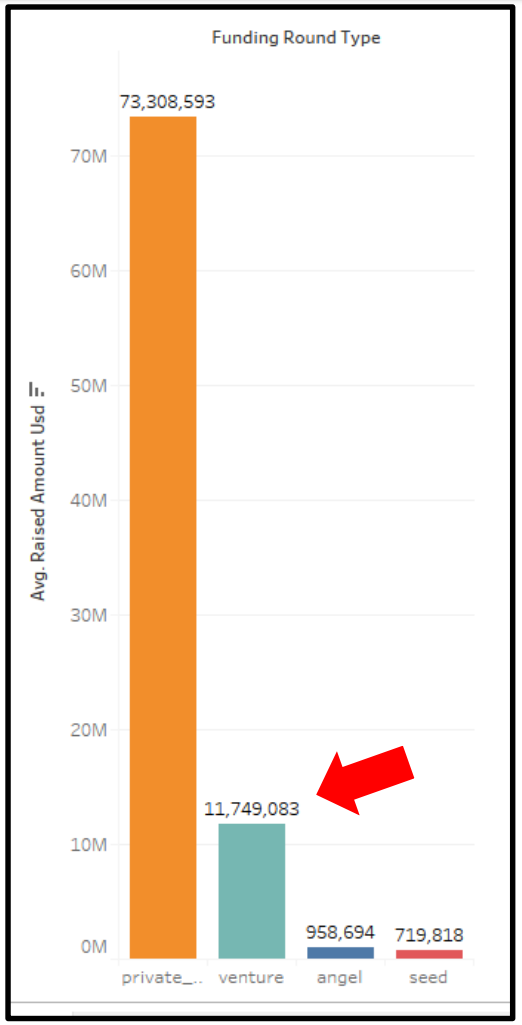
Funding Type

Fraction of Total Investments (globally)



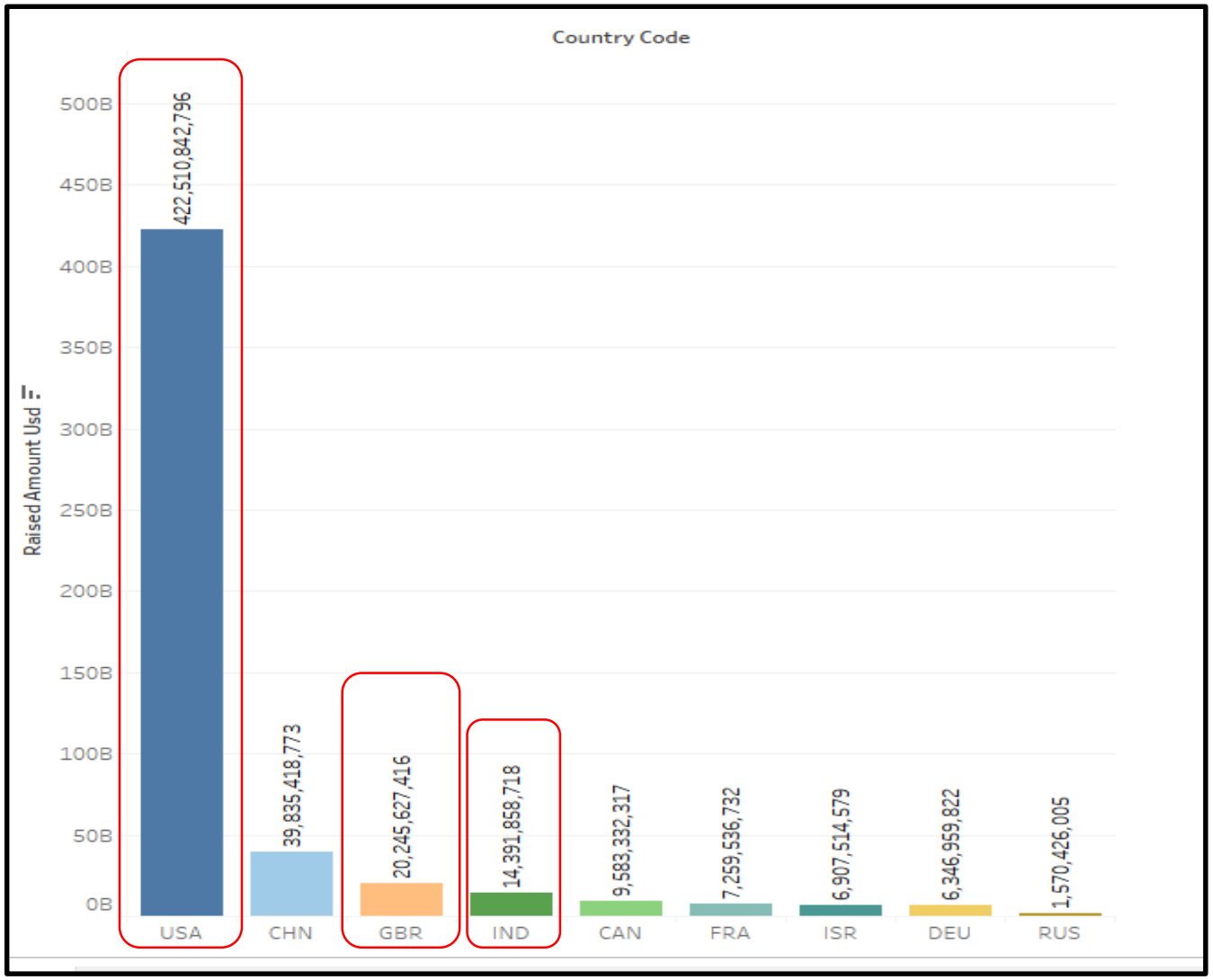


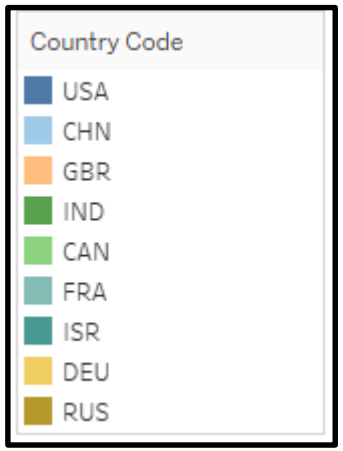
Average Amount of Investment



PLOTS

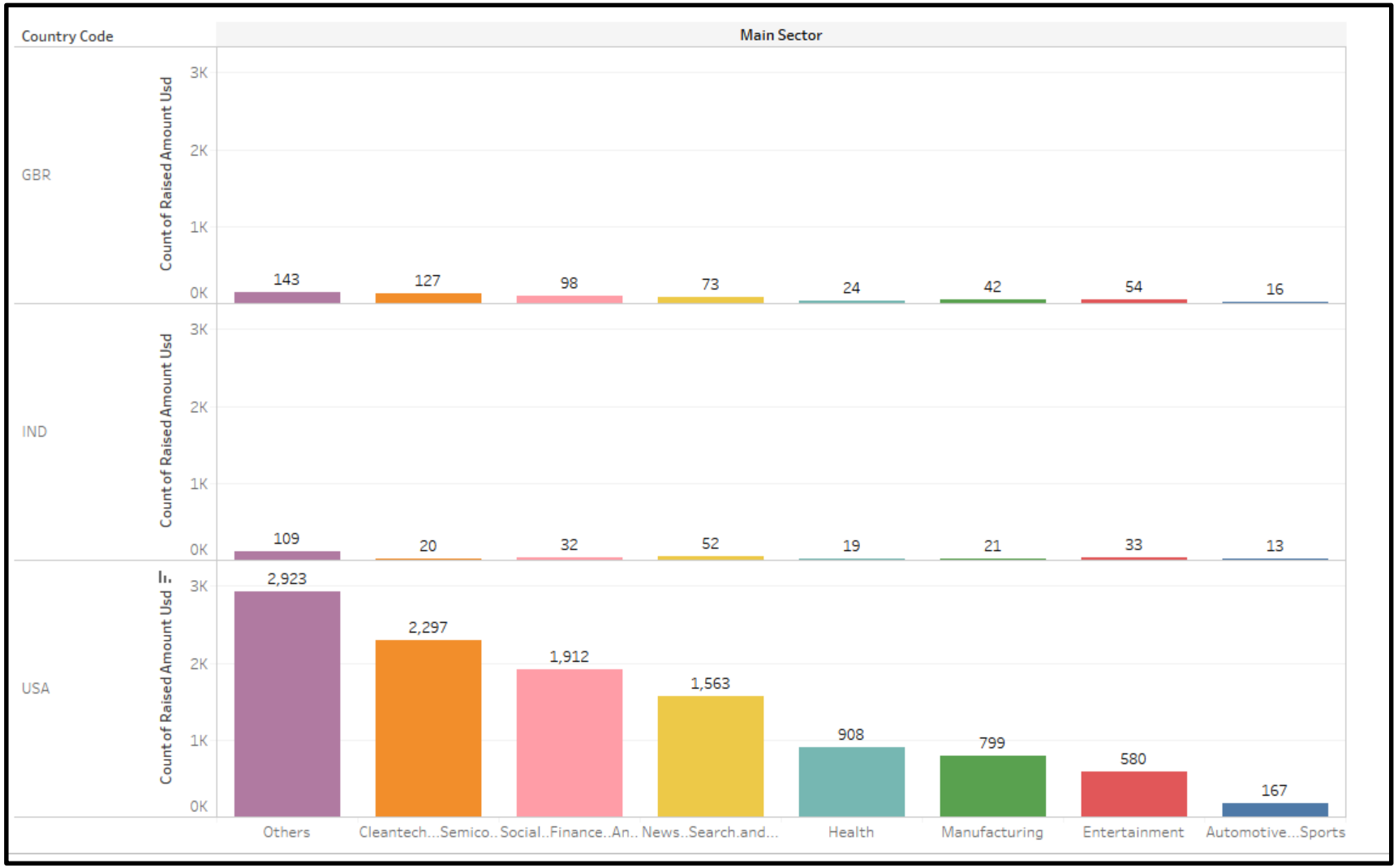
Top 9 Countries

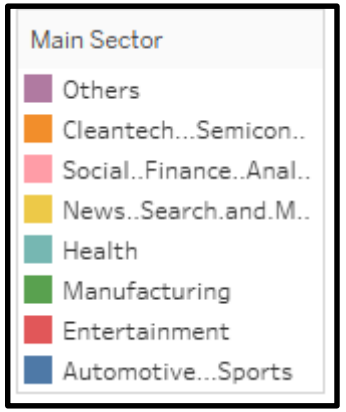




PLOTS

Top 3 Sectors/ Countries





Conclusions

1. "**venture**" type funding is most suitable for Spark Funds due to
    1. The Average funding value for "venture" type funding is 11.75M USD, which is in the range preferred by Spark Funds
    2. The fraction of total investments (globally) is very much higher (78.30%) for venture compared to other funding types
2. The Top three English speaking countries where highest investments are taking place are
    1. **USA**
    2. **GBR**
    3. **IND**
3. The top sectors to invest in USA are
    1. Others
    2. Cleantech...Semiconductors
    3. Social..Finance..Analytics..Advertising
4. The top sectors to invest in GBR are
    1. Others
    2. Cleantech...Semiconductors
    3. Social..Finance..Analytics..Advertising
5. The top sectors to invest in IND are
    1. Others
    2. News..Search.and.Messaging
    3. Entertainment