INVESTMENT CASE STUDY

SUBMISSION

Group Members:

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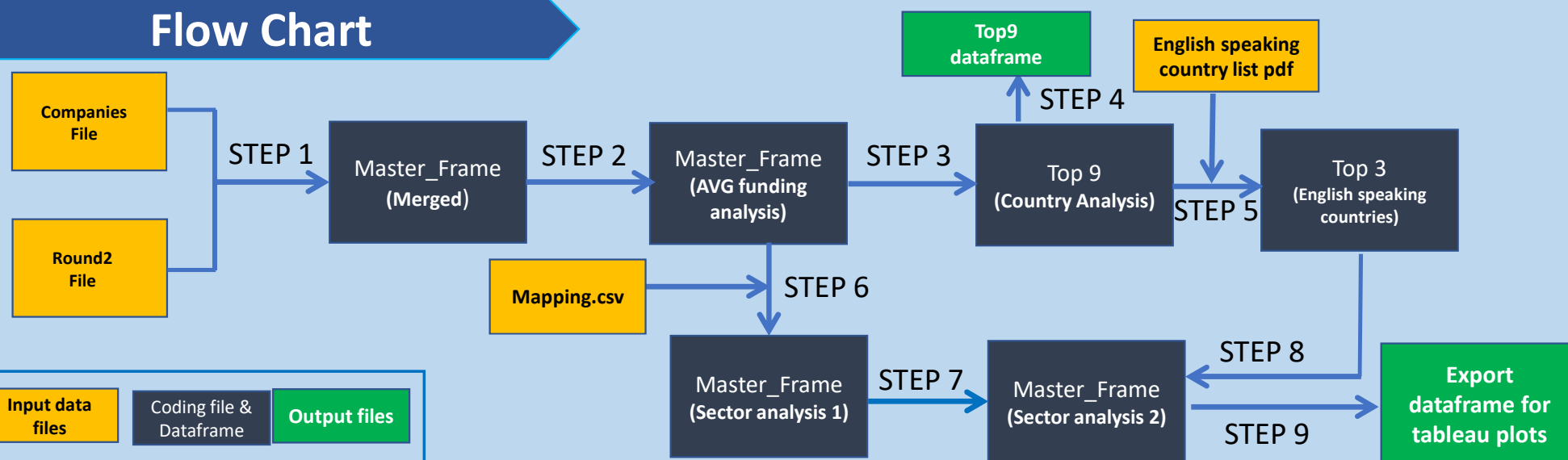   Shaik Shah

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❑ A detailed assessment of the global investment based on different funding type has been performed

❑ Funding type was decided from the four types of global investments: private equity, angel, seed, venture

❑ Total investments from the selected fund type was assessed for Top 9 countries

❑ Sectoral Analysis of the investment fund type for top three countries : USA, GBR, IND

❑ Top companies funded in the top sectors of top 3 countries assessed

❑ Recommendations for Investment

PROBLEM SOLVING APPROACH

Flow Chart

Companies File → STEP 1 → **Master_Frame (Merged)** → STEP 2 → **Master_Frame (AVG funding analysis)** → STEP 3 → **Top 9 (Country Analysis)** → STEP 4 → **Top9 dataframe**

Round2 File

English speaking country list pdf → **Top 3 (English speaking countries)**

STEP 5

Mapping.csv → STEP 6 → **Master_Frame (Sector analysis 1)** → STEP 7 → **Master_Frame (Sector analysis 2)** → STEP 8

STEP 9 → **Export dataframe for tableau plots**

Legend:
- **Input data files**
- **Coding file & Dataframe**
- **Output files**

STEP 1:
a) Data files loaded & encoded
b) Checked for data frame details
c) Merged to form Master_frame

STEP 2:
a) Data was cleaned from NULL values
b) Avg funding amount for fund types determined
c) Funding type within 5-15million was derived

STEP 3:
Top 9 countries with highest investments determined

STEP 4: Export Top9 Country dataframe

STEP 5: Finding the Top 3 English Speaking countries from the PDF file

STEP 6: Importing the mapping.csv file

STEP 7: Mapping the categories with sectors for the investments in Master_frame Dataframe

STEP 8: Creating the top 3 country dataframe for investment & sector analysis for venture fund type

STEP 9: Exporting of Master_Frame, D1, D2, D3 for top 3 countries, as csv file for tableau & excel plots

PROBLEM SOLVING APPROACH

Checkpoint 1 : To create Master Dataframe

- The 2 CSV files – Companies/Rounds2 were read
- Encoding issues were resolved while reading the file
- The columns permalink & company_permalink were converted into lower case to have correct match while merging
- The 2 files were then merged into a new Dataframe called **Master_Dataframe** which will be used as a base throughout the analysis
- Duplicates were removed and row count was taken

Checkpoint 2 : Data Clean up & Determination of Funding Type

- Null counts for each column were calculated and it was found that funding_round_Code had very high % of nulls (72%) followed by founded_at & raised_amount_usd.
- It was decided to drop funding_round_code & founded_at columns since they were not data points for our analysis
- Next for column Raised_Amount_usd we decided to drop rows having null values since this was an important data point for us and amount = 0 did not have any inference for us. We discussed between dropping rows/imputing values and then decided for dropping of rows since imputing would have impacted averages/totals.
- We left the columns state_code, region, city since they were < 10% and had no impact on our analysis
- We decided not to clean up the ~6% data of country_code since we would have lost important data for USD amounts in these rows.
- Averages for different funding types were calculated & 'Venture' came out as the funding type for Spark.

Checkpoint 3 : Find Top3 English speaking countries for 'Venture' Type

- For Venture FT, companies were grouped by country code and sum was calculated for each country
- Top 9 companies which came out were USA,CHN,GBR,IND,CAN,FRA,ISR,DEU,JPN
- Then, manually, PDF was checked for English speaking countries & top 3 identified were – **USA, GBR, IND**

Checkpoint 4 : Find 'Main Sector' from 'Category List'

- A new column Primary Sector was created in the master dataframe from category_list column by taking the 1st string before the '|' symbol.
- For identification of Main Sector, a new CSV – mapping.csv was read & transformed to get 1-1 mapping of primary sector against Main sector
- Mapping DF was cleaned by replacing '0' with 'na' as we found there were data quality issues with the mapping file. Special case of 'Enterprise 2.0' was not transformed and taken care of.
- Blank row from category list was cleaned up from Mapping DF.
- The master dataframe was then merged with this mapping file to get the Main Sector for each primary sector in Master Dataframe using inner join. Any sector not present in Mapping file was omitted from the file.

Checkpoint 5 : Find number of investments in Top 3 sectors of Top 3 Countries

- 3 new DataFrames were created one for each USA/GBR/IND for Funding type = 'Venture' & funding range 5 to 15 million USD inclusive
- Then 2 new columns 'Total number of investments' & 'Total amounts invested' were added by grouping on 'Main Sector' and counting/summing the rows respectively
- Top 3 Main Sectors were then identified for each country individually based on raised amount
- Note : Since 'Others' is a combination of multiple categories we did not project it as one of the 'heavily invested sectors' ('Others' topped for some of the countries)

Global Investments based on Fund Type
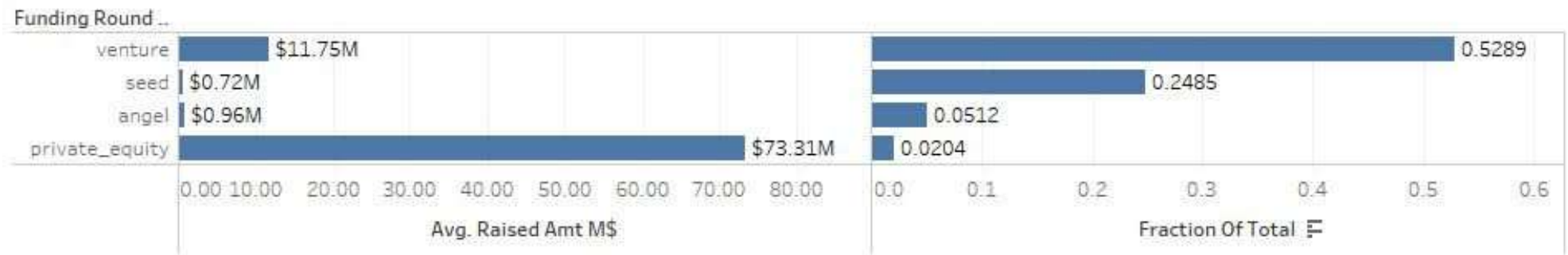
- Maximum amount of investments are towards venture funding (52.89%)

- Maximum average investments raised in private equity ($73.3million)

- Considering the funding range per investment 5million to 15million USD, the recommendation is to Fund "Venture" type investments where the average funding per investment is $11.75million
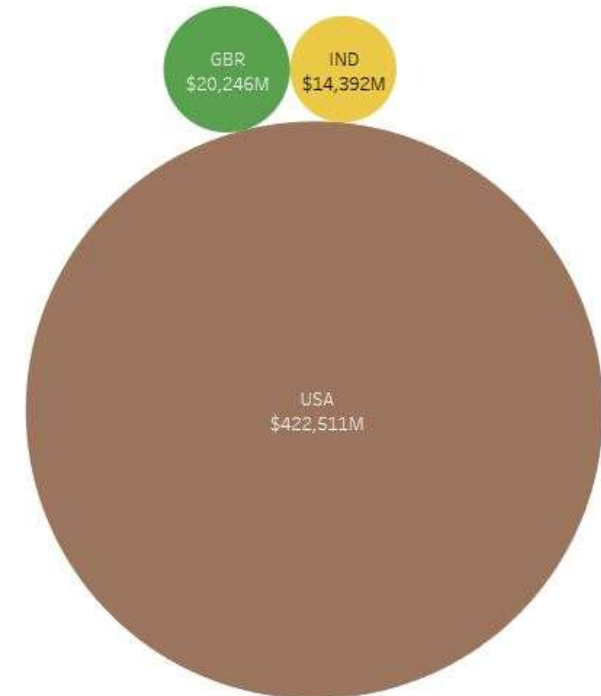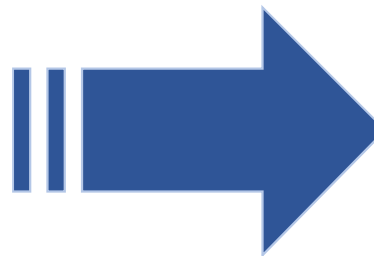
Recommendation to Spark Fund on Fund Type: Venture

Countries with Top Venture Type Funding

Top 9 Venture Funded Countries
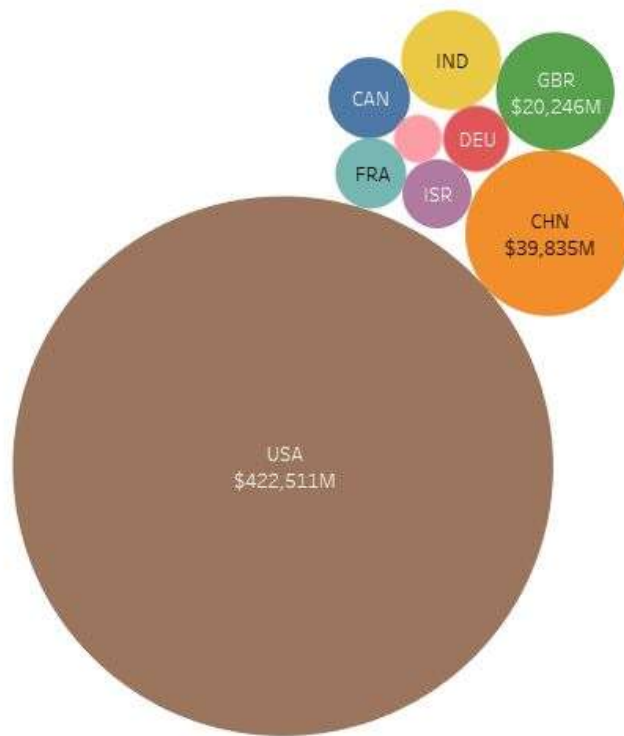
**Top 3 Venture funded Countries
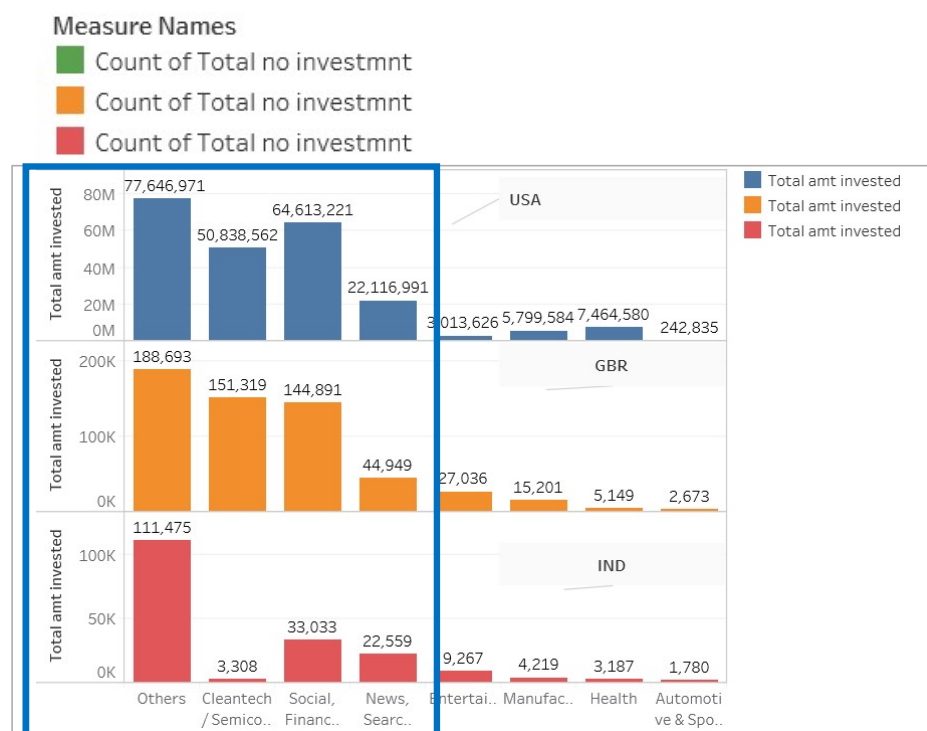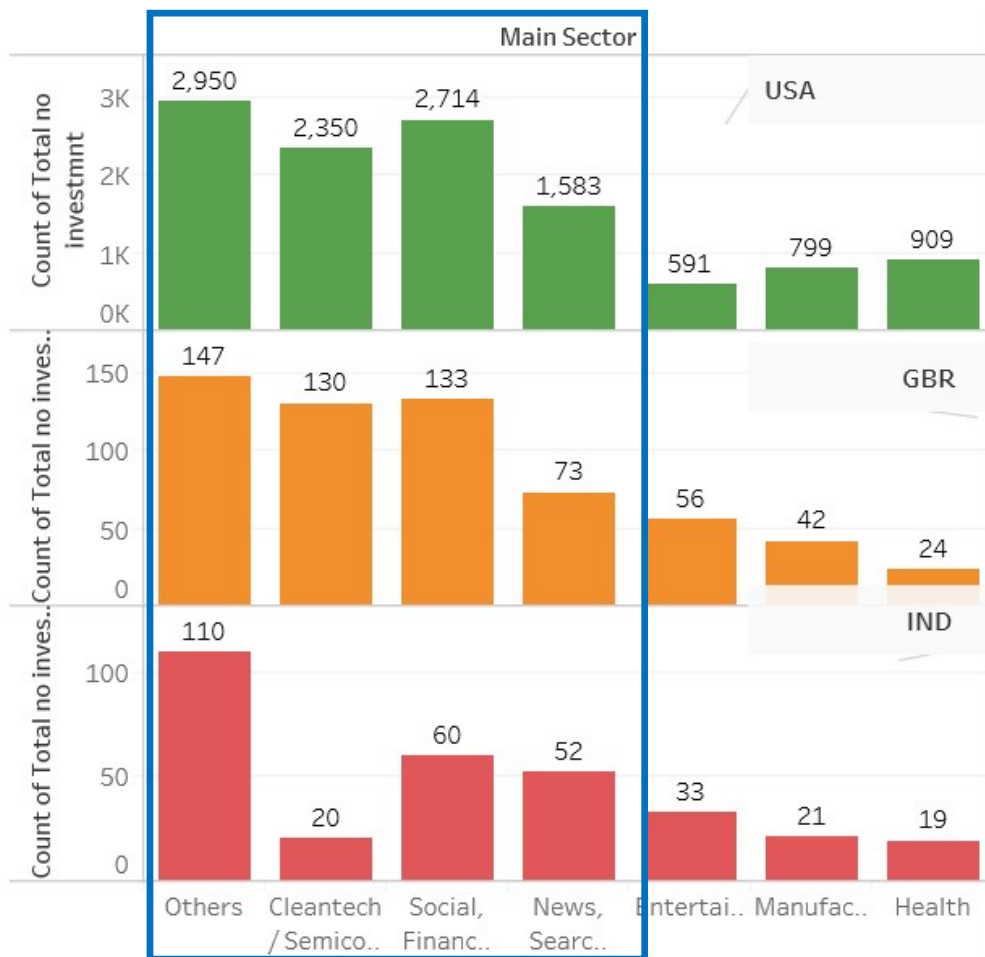(English speaking)**

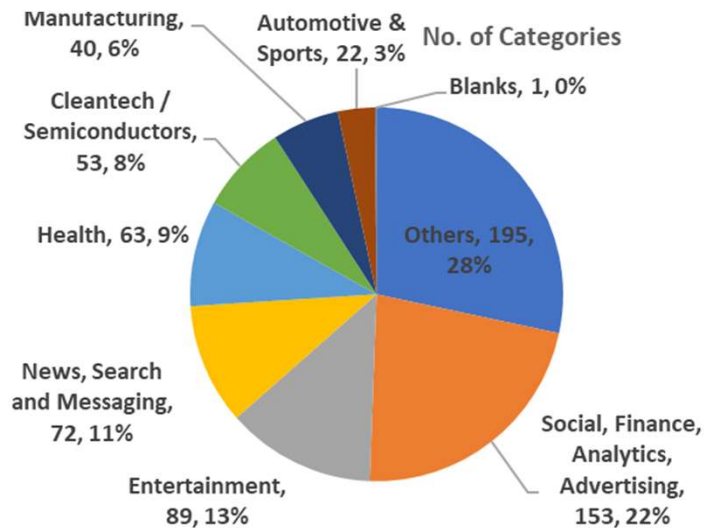**Recommendation: Venture type investments in USA, Great Britain, India**

Top Sectors for Venture Investment in Top Three Countries

Top Sectors in terms of number of Investment & amount of investment across USA, GBR, IND:

- **Others**
- **Social, Finance, Analytics, Advertising**
- **Cleantech / Semiconductors**
- **News, Search and Messaging**

Deep Dive into "Others" Sector in Sectoral Analysis

Number of Categories forming Main Sectors (as taken from Mapping details)

Pie chart data:
- Manufacturing, 40, 6%
- Automotive & Sports, 22, 3%
- No. of Categories
- Blanks, 1, 0%
- Cleantech / Semiconductors, 53, 8%
- Health, 63, 9%
- Others, 195, 28%
- News, Search and Messaging, 72, 11%
- Entertainment, 89, 13%
- Social, Finance, Analytics, Advertising, 153, 22%

- Others sector has diverse categories ranging from e-commerce, education, web services, telecom, hospitality, enterprise, security, logistics, web services, etc.

- Looking at mapping, Others comprises of 28% of categories from diverse industries.

- Multiple Companies from diverse primary sectors appear to have received maximum funding.

Above points indicate a conclusive decision cannot be taken if "Others" is considered among the Top Sectors in Sectoral analysis of USA, GBR, IND.

Recommendation: Considering "Others" Sector in investments is inconclusive

Top Sectors for Venture Investment in Top Three Countries (excluding Others Category)
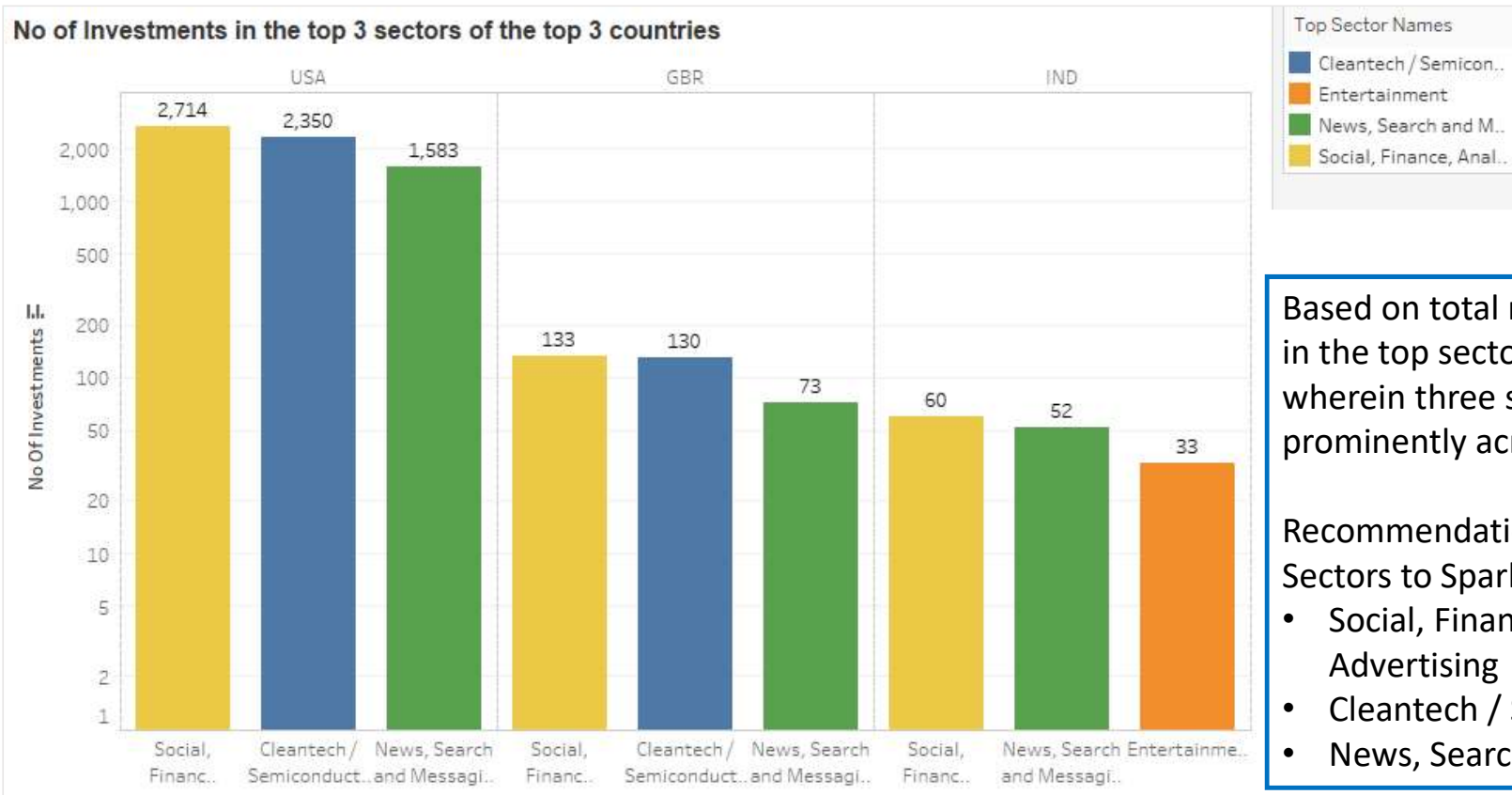
Based on total number of investments in the top sectors, a **clear trend** is seen wherein three sectors show up prominently across USA, GBR, IND.

Recommendation for Top Three Sectors to Spark Fund:
- Social, Finance, Analytics, Advertising
- Cleantech / Semiconductors
- News, Search and Messaging

Top Companies in Top TWO Sectors of Top Three Countries

UpGrad

Multiple companies have received same maximum investment amount.

Top Companies were shortlisted based on following:

1. Top two Sector of respective country
2. Maximum Total Investment amount
3. Company Status - Operating
4. Recent Funding - 2015 or 2014

name	status	country_c	funded_a	raised_am	primary_s	Main_Sector
Talkdesk	operating	USA	09-06-15	15000000	customer	Social, Finance, Analytics, Advertising
Talkdesk	operating	USA	07-10-15	6000000	customer	Social, Finance, Analytics, Advertising
PeerNova	operating	USA	24-09-15	5988164	big data	Social, Finance, Analytics, Advertising
PeerNova	operating	USA	01-04-15	5000000	big data	Social, Finance, Analytics, Advertising

name	status	country_c	funded_a	raised_am	primary_s	Main_Sector
WISErg	operating	USA	05-10-15	13372313	clean tech	Cleantech / Semiconductors
Agrivida	operating	USA	05-01-15	12348733	biotechno	Cleantech / Semiconductors
Biodesix	operating	USA	12-01-15	12000000	biotechno	Cleantech / Semiconductors
Biodesix	operating	USA	23-06-15	11000000	biotechno	Cleantech / Semiconductors
WISErg	operating	USA	24-03-15	11000000	clean tech	Cleantech / Semiconductors
Agrivida	operating	USA	18-08-15	10700000	biotechno	Cleantech / Semiconductors
Kanyos Bio	operating	USA	12-06-15	10399876	biotechno	Cleantech / Semiconductors
Vigeo Ther	operating	USA	12-06-15	10000000	biotechno	Cleantech / Semiconductors
Vigeo Ther	operating	USA	02-06-15	10000000	biotechno	Cleantech / Semiconductors
Intellicyt	operating	USA	22-10-15	7400000	biotechno	Cleantech / Semiconductors
Kanyos Bio	operating	USA	12-06-15	6009268	biotechno	Cleantech / Semiconductors
RetroSens	operating	USA	12-11-15	6000000	biotechno	Cleantech / Semiconductors
RetroSens	operating	USA	08-01-15	6000000	biotechno	Cleantech / Semiconductors
Intellicyt	operating	USA	28-07-15	5444672	biotechno	Cleantech / Semiconductors

name	status	funding_r	funded_a	raised_am	primary_s	Main_Sector
Manthan Systems	operating	venture	09-12-09	15000000	analytics	Social, Finance, Analytics, Advertising
Manthan Systems	operating	venture	15-02-12	15000000	analytics	Social, Finance, Analytics, Advertising
Manthan Systems	operating	venture	20-11-09	15000000	analytics	Social, Finance, Analytics, Advertising
Komli Media	operating	venture	19-01-11	15000000	advertising	Social, Finance, Analytics, Advertising
inTarvo	operating	venture	17-09-09	14000000	consulting	Social, Finance, Analytics, Advertising
Grameen Financial	operating	venture	16-05-14	13500000	finance	Social, Finance, Analytics, Advertising
BankBazaar.com	operating	venture	13-01-14	13000000	credit card	Social, Finance, Analytics, Advertising
Microland	operating	venture	09-08-06	11000000	analytics	Social, Finance, Analytics, Advertising
Eka Software Solu	operating	venture	01-01-09	10000000	analytics	Social, Finance, Analytics, Advertising
Qyuki	operating	venture	16-01-15	10000000	collaborat	Social, Finance, Analytics, Advertising
Grameen Financial	operating	venture	04-12-13	8056050	finance	Social, Finance, Analytics, Advertising
inTarvo	operating	venture	16-10-07	7900000	consulting	Social, Finance, Analytics, Advertising
Microland	operating	venture	14-01-05	7300000	analytics	Social, Finance, Analytics, Advertising
Komli Media	operating	venture	01-01-08	7000000	advertising	Social, Finance, Analytics, Advertising
Eka Software Solu	operating	venture	01-01-05	6000000	analytics	Social, Finance, Analytics, Advertising
Komli Media	operating	venture	14-07-10	6000000	advertising	Social, Finance, Analytics, Advertising
BankBazaar.com	operating	venture	18-03-11	6000000	credit card	Social, Finance, Analytics, Advertising
Manthan Systems	operating	venture	01-03-07	5700000	analytics	Social, Finance, Analytics, Advertising
Qyuki	operating	venture	14-02-12	5400000	collaborat	Social, Finance, Analytics, Advertising

name	status	funding_r	funded_a	raised_am	primary_s	Main_Sector
Bluestone.com	operating	venture	24-01-12	5000000	curated w	News, Search and Messaging
Bluestone.com	operating	venture	18-03-14	10000000	curated w	News, Search and Messaging
Quikr	operating	venture	09-05-11	8000000	curated w	News, Search and Messaging
Quikr	operating	venture	31-03-10	6000000	curated w	News, Search and Messaging
GupShup	operating	venture	14-10-08	11000000	mobile	News, Search and Messaging
GupShup	operating	venture	02-03-10	12000000	mobile	News, Search and Messaging
GupShup	operating	venture	22-12-06	10000000	mobile	News, Search and Messaging
SMS GupShup	operating	venture	20-01-10	12000000	mobile	News, Search and Messaging
SMS GupShup	operating	venture	31-08-11	10000000	mobile	News, Search and Messaging
Roadrunnr	operating	venture	21-06-15	11000000	delivery	News, Search and Messaging
Roadrunnr	operating	venture	26-10-15	10000000	delivery	News, Search and Messaging
hike	operating	venture	31-03-14	14000000	messaging	News, Search and Messaging
hike	operating	venture	25-04-13	7000000	messaging	News, Search and Messaging
Matrimony.com	operating	venture	06-02-08	11750000	classifieds	News, Search and Messaging
Matrimony.com	operating	venture	02-08-06	8650000	classifieds	News, Search and Messaging

name	status	country_d	funded_at	raised_amount_usd	primary_sector	Main_Sector
SimilarWeb	operating	GBR	25-11-14	15000000	advertising	Social, Finance, Analytics, Advertising
Zopa	operating	GBR	01-03-06	15000000	finance	Social, Finance, Analytics, Advertising
OpenGamma	operating	GBR	08-08-12	15000000	financial services	Social, Finance, Analytics, Advertising
myThings	operating	GBR	20-03-12	15000000	accounting	Social, Finance, Analytics, Advertising
SportPursuit	operating	GBR	22-11-15	14448230	advertising	Social, Finance, Analytics, Advertising
VisualDNA	operating	GBR	25-02-09	13550000	advertising	Social, Finance, Analytics, Advertising
PurpleBricks	operating	GBR	18-08-14	13364740	business services	Social, Finance, Analytics, Advertising

name	status	country_d	funded_at	raised_amount_usd	primary_sector	Main_Sector
Apitope	operating	GBR	29-09-15	13456610	biotechnology	Cleantech / Semiconductors
Autifony Therapeutics	operating	GBR	10-07-15	12336350	biotechnology	Cleantech / Semiconductors
Oxford Photovoltaics	operating	GBR	06-03-15	12114420	clean technology	Cleantech / Semiconductors
GEV Global	operating	GBR	29-10-15	8264273	energy	Cleantech / Semiconductors
Abcodia	operating	GBR	18-05-15	8259067	biotechnology	Cleantech / Semiconductors
NovaBiotics	operating	GBR	19-01-15	7569850	biotechnology	Cleantech / Semiconductors
Oxford Photovoltaics	operating	GBR	08-10-15	6705937	clean technology	Cleantech / Semiconductors
Quartet Medicine	operating	GBR	07-10-15	6000000	biotechnology	Cleantech / Semiconductors
Arvia Technology	operating	GBR	01-04-15	5928678	clean technology	Cleantech / Semiconductors

USA

Social, Finance, Analytics, Advertising: TalkDesk

CleanTech: WISErg

GBR

Social, Finance, Analytics, Advertising: SimilarWeb

CleanTech: Oxford Photovoltaics

IND

Social, Finance, Analytics, Advertising: Manthan Systems

News, Search, Messaging: Hike and RoadRunnr

From the detailed assessment of the global investments following recommendations are being made to Spark Funds:

- Venture type funding in USA, Great Britain, India in main sectors:

  1. Social, Finance, Analytics, Advertising (USA, GBR, IND)
  2. News, Search and Messaging (USA, GBR, IND)
  3. Cleantech / Semiconductors (USA, GBR)
  4. Entertainment (IND)

- Investments recommended in following **operating companies** that **received total highest funding in recent years** from the **top two se**ctors:

USA	GBR	IND
TalkDesk	SimilarWeb	Manthan Systems
WISErg	Oxford Photovoltaics	Hike & Roadrunnr