SYNOPSIS REPORT

ON

Analysis on Startup Funding

SUBMITTED BY

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UNDER THE GUIDANCE OF

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SUBMITTED IN THE PARTIAL FULFILMENT OF

MSc COMPUTER SCIENCE Semester III

FOR THE ACADEMIC YEAR 2019-2020

UNIVERSITY OF MUMBAI

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ACKNOWLEDGEMENT

I have taken efforts in this project research. It would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to all of them. I wish to express my sincere gratitude to Ms. Nilofar Shaikh, who has helped me to understand this project in a very easy manner. She made things easier, that is the reason I developed a great interest in this topic of my project. Under her guidance, I had increased knowledge of how Data analysis is done in the real world. Big Data was a new subject for us and the concepts within it were made simpler and were well explained by our teacher.

I would also wish to express my appreciation to The Principal Sir, Coordinator Arti Ma'am, and all the teaching staff of the college. They all helped me and contributed to a great extent for making me familiar with this topic and provided all the necessary support to me whenever I needed it. Last but not least I would like to thank all my classmates who have helped me a lot to understand and make things easier at a student level.

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TITLE

Project synopsis on “Analysis on Startup Funding”

INDEX

INTRODUCTION

A startup or start-up is a company or project initiated by an entrepreneur to seek, effectively develop, and validate a scalable business model. While entrepreneurship refers to all new businesses, including self-employment and businesses that never intend to grow big or become registered, startups refer to the new businesses that intend to grow large beyond the solo founder. Startups face high uncertainty and have high rates of failure, but a minority of them do go on to be successful and influential. Some startups become unicorns, i.e. privately held startup companies valued at over US$1 billion.

Startups typically begin by a founder (solo-founder) or co-founders who have a way to solve a problem. The founder of a startup will begin market validation by problem interview, solution interview, and building a minimum viable product (MVP), i.e. a prototype, to develop and validate their business models. The startup process can take a long period of time (by some estimates, three years or longer), and hence sustaining effort is required. Sustaining effort over the long term is especially challenging, because of the high failure rates and uncertain outcomes.

A startup is a young company founded by one or more entrepreneurs in order to develop a unique product or service and bring it to market. By its nature, the typical startup tends to be a shoestring operation, with initial funding from the founders or their families.

KEY TAKEAWAYS

- A startup is an entrepreneurial venture in search of enough financial backing to get off the ground.
- The first challenge for a startup is to prove the validity of the concept to potential lenders and investors.
- Startups are always risky propositions but potential investors have several approaches to determining their value.
- One of the startup's first tasks is raising a substantial amount of money to further develop the product. In order to do that, they have to make a strong argument, if not a prototype, that supports their claim that their idea is truly new or better than anything else on the market.

Understanding the Startup

In the early stages, startup companies have little or no revenue coming in. They have an idea, and they have to develop it, test it, and market it. That takes considerable money, and startup owners have several potential sources to tap.

Traditional funding sources include small business loans from banks or credit unions, government-sponsored Small Business Administration loans from local banks, and grants made by nonprofit organizations and state governments.

So-called incubators, often associated with business schools and other nonprofits, provide mentoring, office space, and seed funding to startups.

Venture capitalists and angel investors actively seek out promising startups to bankroll in return for a stake in the company once it gets off the ground.

Valuing the Startup

Startups have no history and less profit to show. That makes investing in them risky. If an idea seems to have merit, potential investors may use any of several approaches to estimate how much money it could take to get it off the ground.

The cost to duplicate approach looks at the expenses the company has already incurred to develop its product or service and purchase physical assets. This valuation method doesn't consider the company's future potential or intangible assets.

The market approach considers the acquisition costs of similar companies in the recent past. This approach may be stymied if the startup idea really is unique.

The discounted cash flow approach looks at the company's expected future cash flow. This approach is highly subjective.

The development stage approach assigns a higher range of potential value to a startup that is more fully developed. Even if it's not profitable, a startup that has a website and can show some sales and traffic would get a higher valuation than one that merely has an interesting idea.

Because startups have a high failure rate, would-be investors consider the management team's experience as well as the idea. Even angel investors don't invest money they cannot afford to lose.

Some Successful Startups

Some of history's most successful entrepreneurs created startups called Microsoft, founded by Bill Gates, Ford Motors, founded by Henry Ford, and McDonald's, founded by Ray Kroc.

Here are some startups that you may not have heard of yet, but LinkedIn bets that you will someday. They are among its picks for 2018's Top Startups.

Rubrik, a cloud data management company founded in 2014

Aurora, a developer of hardware and software for self-driving vehicles

Glossier, a skincare and beauty product company

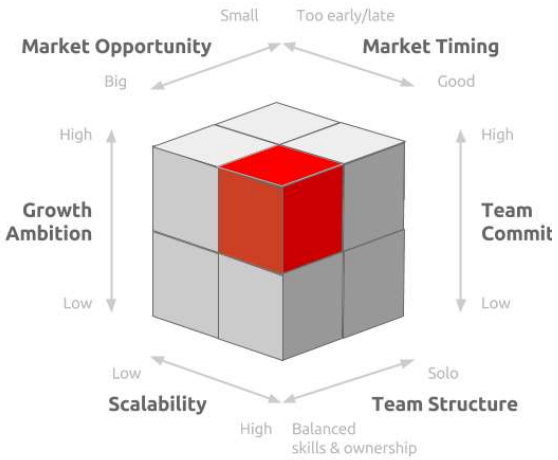
Ripple, a network that uses blockchain technology to process currency exchange transactions

Why Startups?

Startups are "optimal" vehicles to validate and bring new innovations to the markets. Especially more disruptive innovations. Startups encapsulate all but only relevant things for what's needed to build new innovations with minimum "wasted resources" combined with maximum drive & motivation.

Startups create most of new jobs, attract international talent and foreign direct investments. "Over the last twenty-five years, almost all of the private sector jobs have been created by businesses less than five years old. Between 1988 and 2011, companies more than five years old destroyed more jobs than they created in all but eight of those years." - Source: study by Kauffman Foundation and the Institute for Competitiveness & Prosperity

Ideas are cheap. Execution is everything. It's all about the people,' I only invest when I think I have found the right team for the right business." – Chris Sacca



Action Plan of Startup India Scheme

The action plan of Startup India is based on the following factors:

1. Simplification of Work

This initiative simplifies the work for the new entrants in order to motivate them. This includes following steps taken by the government:

Firstly, the government has set-up Startup India hubs where all the works related to incorporation, registration, grievance handling, etc.

Secondly, an application and an online portal is set-up by the government to facilitate registration from anywhere and anytime.

Thirdly, the patent acquisition and registration is now fast for the startups.

Lastly, according to the Insolvency and Bankruptcy Bill, 2015 facilitates fast winding up of the startups. A new startup can wind-up itself within 90 days of the incorporation.

2. Finance Support

In order to motivate the startups, the government provides various financial supports. These steps taken by the government are as follows:

The government has set up a corpus of Rs.10,000 crores for 4 years (Rs.2500 crore each year). From such fund, the government invests in various startups.

Special funds are provided, investment in which leads to exemption from the income tax on the Capital Gain.

Income tax exemption is available for the startups for the first 3 years after the incorporation.

Under The Income Tax Act, where a Startup (company) receives any consideration for issue of shares which exceeds the Fair Market Value of the shares, such excess consideration is taxable in the hands of the recipient as Income from Other Sources.

Investment by venture capital funds in Startups is exempted from the application of this provision. The same extends to the investment made by incubators in the Startups.

In order to meet the objectives of the initiative, Government of India Action Plan that addresses all aspects of the Startup ecosystem has been announced. With this Action Plan the Government hopes to accelerate spreading of the Startup movement:

- From digital/ technology sector to a wide array of sectors including agriculture, manufacturing, social sector, healthcare, education, etc.; and
- From existing tier 1 cities to tier 2 and tier 3 cities including semi-urban and rural areas.

The Action Plan is divided across the following areas:

- Simplification and Handholding
- Funding Support and Incentives

- Industry-Academia Partnership and Incubation

Government Initiatives For Business Development

- SETU (Self Employment and Talent Utilization)

Benefits of Startup India

- Financial Benefits
- Income Tax Benefits
- Registration Benefits
- Government Tenders
- Huge Networking Opportunities

1. Financial Benefits

Most of the startups are patent based. It means they produce or provide unique goods or services. In order to register their patents, they have to incur a heavy cost which is known as the Patent Cost.

Under this scheme, the government provides 80% rebate on the patent costs. Moreover, the process of patent registration and related is faster for them. Also, the government pays the fees of the facilitator to obtain the patent.

2. Income Tax Benefits

Startups enjoy a good amount of benefits under the Income Tax head. The government exempts their 3 years income tax post the incorporation year.

But they can avail it only after getting a certificate from the Inter-Ministerial Board. Also, they can claim exemption from tax on Capital Gains if they invest money in specified funds.

3. Registration Benefits

Everyone believes that incorporation and registration of business are far more difficult than running it. It is because of the long and complex steps of registration.

Under the Startup India scheme, an application is there to facilitate registration. A single meeting is arranged to at the Start-up India hub. Also, there is a single doubt and problem-solving window for them.

4. Government Tenders

Everyone seeks to acquire Government tenders because of high payments and large projects. But it is not easy to acquire the government tenders.

Under this scheme, the startups get priority in getting government tenders. Also, they are not required to have any prior experience.

5. Huge Networking Opportunities

Networking Opportunities means the opportunity to meet with various startup stakeholders at a particular place and time. The government provides this opportunity by conducting 2 startups fests annually (both at domestic as well as the international level).

Startup India scheme also provides Intellectual Property awareness workshop and awareness.

Registration of the Startup can be done only from following types of companies

1. Partnership Firm
2. Limited Liability Partnership Firm
3. Private Limited Company

Eligibility for Registration under Startup India Scheme

1. Firstly, the company to be formed must be a private limited company or a limited liability partnership firm.

2. Secondly, the firms should have obtained approval from the Department of Industrial Policy and Promotion.

3. Thirdly, it must have a recommendation letter by an incubation.

4. The firm must provide innovative schemes or products.

5. It should be a new firm or not older than five years.

6. The total turnover of the company should be not exceeding 25 crores.

7. Lastly, it should not be a result of splitting up, or reconstruction, of a business already in existence.

RELATED WORK

Start-up Funding via Equity Crowdfunding in Germany – A Qualitative Analysis of Success Factors

Entrepreneurs often struggle to find sufficient funding for their start-ups. A relatively new way for companies to attract capital is via an internet platform, locating investors who in return receive something in return for their ventures. Equity crowdfunding is one of several types of crowdfunding, and is also known as crowd investing in the German-speaking realm. This article predominantly advances the scientific knowledge regarding the success factors of equity crowdfunding for German start-ups. The study conducted nine qualitative interviews with start-ups and crowd investing platforms. Its first result is that German start-ups select crowd investing because (1) it is a funding opportunity and (2) it has an expected marketing effect. To organize the results of relevant success factors, the Crowd investing Success Model was designed by the researchers. This supports German entrepreneurs by presenting 20 important success elements that help to increase the capital collected during a campaign. The key finding is that an attractive business model, an appropriate preparation in the pre-campaign period, ongoing activities during the campaign, and corresponding advertising activities have a positive impact on a German start-up's crowd investing campaign's chances of success. The article closes with implications for theory and practice, as well as further research suggestions.

Crowd investing is no longer a fad. It's a real phenomenon changing the way start-ups raise capital. With that being said, established companies are also looking for financing options for new products. So crowd investing has gone from being an investment opportunity to a vital source of venture capital (Tomzcak & Brem, 2013). Developed within this decade, it's a relatively new research field (Hagedorn & Pinkwart, 2013), with the amount of academic literature on the topic increasing notably over the last five years (Moritz & Block, 2014 and Bouncken et al. 2015). The word "crowdfunding" basically originates from crowdsourcing, albeit with a focus on investment rather than getting users involved in product development. Crowdfunding can be defined "as the act of acquiring third-party financing from the general public via an intermediary, generally in the form of a web-based platform" (Tomczak & Brem, 2013, p. 339). This kind of matchmaker platform gives investors direct access to projects that are seeking funding, while the company seeking funds obtains access to truly interested customers (Ordanini et al., 2011). Moreover, there are investment (Schwienbacher & Larralde, 2012). The research in this article is focused on equity investments, which is commonly categorized under crowd investing (Berm et al., 2014).

Hence, we further consider reward crowdfunding, which is commonly used to support the product development, and crowdlending, which obliges start-ups to pay predetermined interest rates (Hemer, 2011; Hornuf & Schwienbacher, 2015a).

Determinant of Start-ups' Fund-raising Value: Entrepreneur and Firm Characteristic

Technology advancement or what so-called "creative disruption" is the major force of economic growth in the world of capitalism. Nonetheless, innovation and R&D activities are often difficult to finance in a freely competitive marketplace. The "disruptive innovations" tend to be produced by the small firm, or the 'outsider', who able to disrupt the incumbent firm, to create new progression to the world.

One way to manage technology is to create the business model of the venture that able to transit innovation freely. Startup is one of the business models that help propel the diffusion of technology.

Financing startup is not an easy task as most of the bank churn away from the project due to high risk with no collateral of the project. The empirical studies suggest that the small innovative firm often depend on equity financing rather than debt.

Within the equity fund raising activities, the question of 'How much the company worth?" always be the key question in fund raising activities. Knowing what the key determinant of the fund-raising activities is will help entrepreneur able to finance through valleys of death.

Despite the importance of the fund-raising activities on startup company stand point, valuation always be a challenging task for both investor and entrepreneur.

The challenging in valuation of start-ups is stem from the core problem of corporate finance which are 1) the asymmetric information that could lead to adverse selection, 2) the agency problem and the characteristic of the startup company also embedded the challenge in determining uncertainty into the equation. However, the problem is more pronounce when considering startup firm characteristic of lack of historical data and track record and the high uncertainly of business nature of the new venture. Moreover, many of the small startup firms do not have audited financial statements that can be shared with any provider of outside; partly due to cost outweigh benefit of verification.

Traditional valuation methodologies believe that key challenge on future research of valuation and fund rising activities are lie in four areas. First, the shift of investment from developed market to emerging market (such as South East Asia). Second, the valuation of the young companies which is lack of profit stream and Third, the inability to rely on the financial statement called for the dynamic valuation model rather than static model we are using and Lastly, there is a gap in converting the corporate strategy that driving growth to excess return which drive the value of firm. We therefore attempted to fill up the gap based on both practitioners and researchers by considering the non-financial information factors in the context of ASEAN countries by uniquely collected data.

Data Driven Analysis of Startup Accelerators

Startup accelerators have become the topic of a lot of discussion in the media lately. Because of their novelty, they have not been studied as thoroughly as other forms of business mentorship programs such as small business mentorships. Many experts have made remarks on whether the accelerators are good or not. For example, says that 90% of the accelerators fail but do not provide any form of concrete data to back it up. Few like have taken specific accelerators and shown their successes. However, the availability of analysis of aggregate of accelerators was missing. This paper fills that gap by exploring startup accelerators (or accelerators), by understanding their successes and their growth trends.

Most startups face problems such as lack of experienced management, processes and resources. The problem is compounded by the fact that technology startups usually require a lot more resources in the development phase. As such startups need a partner that understands the perils of a startup and is willing to take various forms of risk with the startup. Startup founders usually are unable to produce enough collateral for a traditional business loan because of expensive nature of technology development. Hence, most of the startups are funded by Venture Capitalists at the growth phase. However, recent trend shows that VCs invest more on later stage startup and the dollar amount of investment usually exceeds 1-2 Million Dollars. As such the need for organization willing to help startups in their early stage with small sums of money and other resources arises. Accelerators fill that need. Accelerators support startups until they are ready to acquire VC funding

OBJECTIVE

Data Analysis is the practice of collecting information or data generated by sites like Kaggle, git-hub and attempting to spot a pattern, or trend, in the information.

The aim of this project is to analyze the Startup funding information on basic characteristics including startup name, investment amount, location, investor.

The “csv file output from Python” and “R queries” will be passed as a input for visualization in software packages like R or python or Tableau to perform further analysis in the form of charts and Graphs

Possible questions which could be answered through analysis are:

- How does the funding ecosystem change with time?
- Do cities play a major role in funding?
- Which industries are favoured by investors for funding?
- Who are the important investors in the Indian Ecosystem?
- How much funds do start-ups generally get in India?
- What is the average Duration of Start-up’s?
- What is the Average Investment?

METHODOLOGY

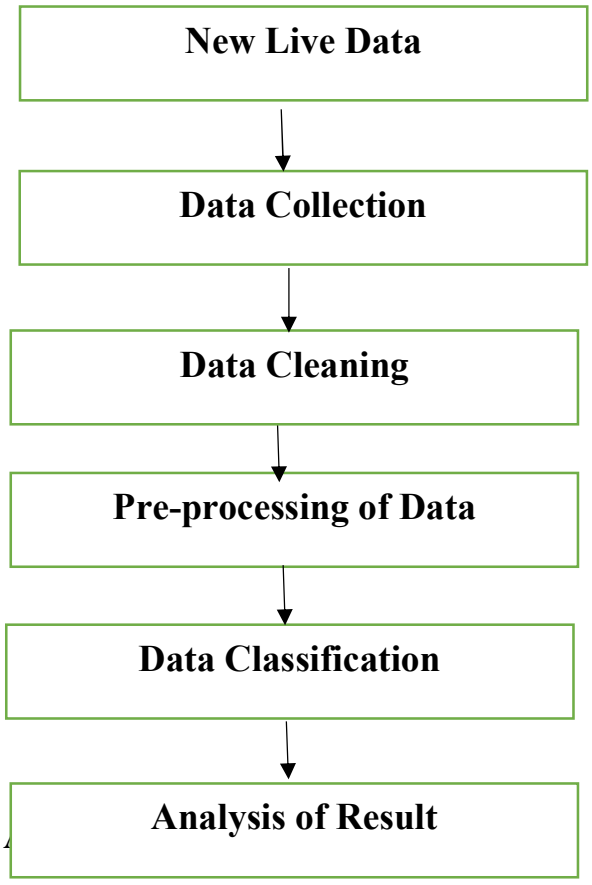
A startup is a young company founded by one or more entrepreneurs in order to develop a unique product or service and bring it to market. By its nature, the typical startup tends to be a shoestring operation, with initial funding from the founders or their families.

Startup India Scheme is an initiative by the Government of India for generation of employment and wealth creation. The goal of Startup India is the development and innovation of products and services and increasing the employment rate in India. Benefits of **Startup India Scheme** is Simplification of Work, Finance support, Government tenders, Networking opportunities. Startup India was launched by Prime Minister Shri. Narendra Modi on 16th January 2016. Let us learn more about Benefits and Eligibility of Startup India.

This dataset has funding information of the Indian startups from January 2015 to August 2017. It includes columns with the date funded, the city the startup is based out of, the names of the funders, and the amount invested (in USD).

SYSTEM ARCHITECTURE

The following diagram illustrates the working of the process of project



As the name suggests Data Collection you must get all the data needed to solve the problem. Collecting data is not very easy because most of the time you won't find data lying in a database, waiting for you. Instead, you'll have to do some research and collect the data or scrape it from the internet. Data used in this project is a set Indian startup funding from Kaggle. Each startup includes the following information:

1) Start-up Name
2) Start-up Date/Month/Year
3) Industry Vertical
4) Sub Vertical
5) City Location
6) Investors Name
7) Investment Type
8) Amount in USD

A. Pre-processing of data

The data pre-processing is responsible for preparing a data for further processing. Classification will be based on various reviews and rating of customer. In Data processing the input data. the customer reviews dataset is pre-processed to improve the classification results. The process of data pre-processing includes two main steps. One is Parts of Speech Tagging which is mainly for positive phrases. To find the phrases with negative prefixes we use Negation Phrase Identification algorithm. Data pre-processing is done to eliminate the incomplete, noisy and inconsistent data a stop word. POS tagging is the process of marking a word in a text as corresponding to a particular part of speech as its context i.e. relationship with adjacent and related words in a phrase, sentence or a paragraph Parts of speech include nouns, verbs, adverbs, adjectives, pronouns, conjunction, prepositions and determiners

B. Data Cleaning

Data cleaning is the process of preparing data for analysis by removing or modifying data that is incorrect, incomplete, irrelevant, duplicated, or improperly formatted. This data is usually not necessary or helpful when it comes to analyzing data because it may hinder the process or provide inaccurate results. There are several methods for cleaning data depending on how it is stored along with the answers being sought.
Data cleaning is not simply about erasing information to make space for new data, but rather finding a way to maximize a data set's accuracy without necessarily deleting information in order to prevent wrongful predictions, it is important to get rid of any inconsistencies in the data.

C. Data Classification

After cleaning of our dataset, we move on to our data processing part or we can use algorithm on our dataset which can further classify our data set on basis of positive and negative comments. We need algorithms to classify our text.

In Data Classification Opinions are given by the user through various sources about the product and their services. Machine learning techniques like Naive Bayes (NB), maximum entropy (ME), and support vector machines (SVM) have achieved great success in sentiment analysis.

Sentiment analysis that saves running time and reduces computational complexity is the analysis done.

Naive Bayes classifier

Naïve Bayes is an algorithm of probability based on Bayes theorem of learning. It aims to create a model in the form of probability. The advantage of Naïve Bayes is an effective method which is easy processing. In other words, classification features are independent of each other given the class. In the context of text classification, NB adopts the Bag-of-Words (BOW) approach. More specifically, the features of the model are the individual words of the text. The data is typically represented by a 2-dimensional word x document matrix. In the Bernoulli NB model, an entry in the matrix is a binary value that indicates whether the document contains a word or not (i.e., {0,1}). The Multinomial NB, on the other hand, uses normalized frequencies of the words in the text to construct the word x document matrix

Support Vector Machines (SVM):

SVM is a supervised machine learning algorithm that is used for classification and regression analysis in multidimensional data spaces. SVM attempts to find optimal hyperplanes for linearly separable patterns in the data and then maximizes the margins around these hyperplanes. Technically, support vectors are the critical instances of the training set that would change the position of the dividing hyperplane if removed. SVM classifies the data by mapping input vectors into an N-dimensional space, and deciding on which side of the defined hyperplane the data instance lies. SVMs have been empirically shown to be effective in domains where the data is sparse and highly dimensional.

SVM and NB have been found to work well with short text. Short-text is a relatively recent Natural Language Processing (NLP) type of text that has been motivated by the explosive growth of micro-blogs on social media (e.g. Tweets and YouTube and Facebook comments) and the urgent need for effective methods to analyze such large amounts of limited textual data. The main characteristics of short-text include data sparsity, noisy content, and colloquial terminologies. In what follows, we investigate the performance of these two classifiers in detecting useful feedback present in comments.

- **K-means cluster**

K-means clustering is a type of unsupervised learning, which is used when you have unlabelled data (data without defined categories or groups). The goal of this algorithm is to find groups in the data, with the number of groups represented by the variable *K*. The algorithm works iteratively to assign each data point to one of *K* groups based on the features that are provided. Data points are clustered based on feature similarity.
K-means clustering is used to classify the retrieved dataset through a certain number of clusters.

D. Analysis of Result: -

You now have a nice dataset so this is a good way to start exploring it by building graphs. When you're dealing with large volumes of data, visualization is the best way to explore and communicate your finding. In order to understand data, it is often useful to visualize it. Normally in Big Data applications, the interest relies in finding insight rather than just making beautiful plots

Data Exploration and Feature Selection

- **Correlation Analysis**
  We plotted the unscaled 'Amount Raised' against all unscaled numerical features, and found no linear correlations. We then plotted the unscaled 'Amount Raised' against all numerical features normalized using transformation, and again found no linear correlations. We did not find linear correlations for scaled 'Amount Raised' against unscaled features either. We did find some homoscedastic correlations for scaled 'Amount Raised' against scaled features', but unfortunately these slopes were flat. From our correlation analysis, we infer that using SVR may be a better method for predictive modelling than linear regression. Code for correlation analysis is here.

- **PCA**
  Principal Component Analysis (PCA) tries to isolate a handful of linear combinations of features that "explain" most variances in the data. This is a descriptive, not predictive, technique, and it operates on the whole dataset without the training/testing division. Moreover, PCA is more informative if all features are suitably normalized, so no single feature can dominate the total variance. We then use Box Cox transformation on each column (the library chooses an appropriate parameter, different for each column, to make the resulting transformation approximately Normal.) The exception is the funding raised, which we use the log transformation (which is also a special case of Box Cox). This is justified because our plot shows that log(funding) looks Normal, and when we predict log(funding), reversing the function to get funding is more expedient. Our PCA shows that only a few (aggregated) features explain most of the variance. 3 top features explain 95% of the variance, while 5 top features explain 98% of the variance. The python notebook for PCA is here.

Predictive Modeling

- **Linear Regression**

SVR: We suspect that the problem is not linear, so we turn to Support Vector Regression (SVR). We split the data into the training data and the testing data, standardize the numerical features of each of the two datasets separately. We try three choices of kernels - rbf, linear and polynomial. For each choice of kernel, we use GridSearchCV with 5-fold cross validation to find the optimal parameters of the predictor over a reasonable (pre-determined) range of parameters. We then fit the predictor to the training data, predict it on the test data, and evaluate it by computing RMSE on log(funding). We found that rbf predictor with C=100 and gamma=0.01 is the best, with RMSE around 1. This result is comparable to linear regression. The python notebook for PCA is here (same notebook as PCA).

System Requirement Specification

A software requirements specification is a description of a software system to be developed it lays out functional and non- functional requirements, and may include a set of use cases that describe the interaction that the software must provide.
software requirements specification establishes the basis for an agreement between customers. and contractors or suppliers (in market-driven projects. These roles may be played by the marketing and development divisions) on what software product is done as well as what is not expected to do, software requirements specifications permit a rigorous assessment of requirements Before the design can begin and reduces later redesign. It should also provide a realistic basis for estimating product costs, risks, and schedules

System Specification:

- **R**

R is a free and open source software programming language and software environment for statistical computing and graphics. Distributed under the GNU General Public License version 2, R is an easy language to learn and commonly used for developing data analysis and statistical software. R compiles and runs on a wide variety of UNIX platforms, Windows and MacOS.

R is designed to allow users to add additional functionality by defining new functions. Much of the system is itself written in the R dialect of the S programming language. For computationally-intensive tasks, C, C++ and Fortran code can be linked and called at run time. Advanced users can write C code to manipulate R objects directly. This programming language was named R, based on the first letter of first name of the two R authors (Robert Gentleman and Ross Ihaka), and partly a play on the name of the Bell Labs Language S.

- **Python**

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its high-level built in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together. Python's simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. Python supports modules and packages, which encourages program modularity and code reuse. The Python interpreter and the extensive standard library are available in source or binary form without charge for all major platforms, and can be freely distributed. Python has been built with extraordinary Python libraries that are used in Big Data every day for solving problems. which are following

- TensorFlow
- NumPy
- SciPy
- Pandas
- Matplotlib

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