Fundementals of Digital Archeaology Final Project Proposal - Analysis of Tech Company Metrics to Gauge Affect on Success and Failure

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***Abstract*— In the following document, an analysis considering factors affecting success and failure of tech companies is proposed. An observation of starup industry of involvement, date of founding, initial funding, and country of origin will be performed. Herein the proposed comparison of these metrics is discussed.**

I. BACKGROUND

Tech companies have been exploding in growth over the past couple decades. They operate in an expansive and diverse range of industries and are formed and operated in a number of locations. Furthermore, many seek funding in their initial operation, further complicating the possible dynamic for fledgling tech companies.

According to the Bureau of Labor Stastics, 220,000 small companies were formed in the first quarter 2014 while 189,000 were disbanded during that quarter. The rate of tech company success has almost consistently outpaced the rate of tech companies death over the past two decades, with the exception of the dot-com bubble and Great Recession of 2008. These astoudning rates of tech company creation and death leave one in awe, and might lead one to wonder, what factors contribute to the success and failure of a tech comapny? In the proposed project, we look to answer this very question.

II. METHODS

A. Comparison and Metrics

In the proposed study, an analysis of a number of metrics and their affect on the success and/or failure of tech company will be performed. Though these factors are not nebulous, they provide a solid baseline off of which various tech companies might be compared. With this baseline, further study on these or other metrics might be performed to establish a more comprehensive understanding on how such subjective metrics affect the success and/or failure of a tech company.

Presently, the proposed factors which will be used for this analysis include the following:

- Country of origin - the country of origin of a sample of tech companies will be analyzed to observe whether or not tech companies established in certain countries are more likely to succeed or more likely to fail. This could be further expounded upon by studying which regions in particularly selected countries offer greater rates of success, and which offer greater rates of failure. This methodology could be extended to much finer granularity, all the way to studying how rates of success and failure of tech companies that originate in different districs of particular cities compare.
- Initial Funding - the initial funding for a sample of tech companies will be analyzed to observe whether or not a company that receives more initial funding is more or less likely to preservere, or whether a company that receives less initial funding is more or less likely to preservere (this might be the case since investors occasionally put greater demand on founders and sway the trajectory of a company, possibly contributing to its demise; this would be a highly favourable candidate for further study, though it is beyond the scope of this study).
- Date Founded - the date of foundation for a sample of tech companies will be analyzed. This will offer insight into how tech companies fare across the span of time and in different climates of innovation, investor interest and confidence, consumer confidence, and even economic climate.
- Category of organization - the category of a sample of tech companies (i.e. organizations) will be observed to determine whether companies in certain categories are more or less likely to succeed than companies in other categories. Of particular interest is how companies in categories with more established markets (such as medical) will compare to companies in categories of emerging markets (such as autonomous vehicles).

In order to determine how the metrics of interest affect rates of success for tech companies, the observation of the average funding of groupings of tech companies that fall in the same class when considered from the perspective of the above metrics will be performed. For example, when analyzing how country of origin affects tech companies success, the average funding of tech companies in each given country will be computed, then these results will be comnpared across countries. This methodology of comparison will be propagated across all the above proposed metrics, with a comparison between classes resulting for each metric. In

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this manner, the average success of companies in each class for the given metrics will be established by observing the resulting average funding for said class, which will then be compared to the remaining classes. It should be noted that companies that have closed will be omitted from this sample, as a company has not succeeded by this definition if it has closed.

In order to determine how the above metrics affect rates of success for tech companies, the average rates of closure for groupings with respect to the metrics of interest will be analyzed. For example, when analyzing how area of industry affects startup failure, the average rate of closure of tech companies for each given industry, the results of these averages will then be compared across industries. In this manner, the affect of all metrics of interest will be compared across classes. In this manner, the average failure of companies in each class will be established for the given metrics. As with rates of success, the resulting average rate of closure of companies in each given class will be noted and compared to the all other classes for the given metric.

Following the computation of the averages for classes in each given metric, the averages will be plotted in such a way to demonstrate the disparity between classes for each metric. Two graph will result for each of the metrics of interest - one for analyzing the metric's average affect on tech company success, and one for analyzing the metric's average affect on tech company failure.

Companies with IPOs will be filtered out of the data, so pre-IPO companies can be the focus of the comparison.

B. Data Sources

The Crunchbase information platform will be used to obtain the data for this study. As per Crunchbase, "Crunchbase is the destination for discovering industry trends, investments, and news about hundreds of thousands of public and private companies globally." Though Crunchbase provides information on publically trades companies, the focus of this study will be pre-IPO companies (see *Assumptions* for further discussion).

The data will be obtained via Excel export. Crunchbase provides its data in this format, and it is up to date to the very day its exported. Obtaining the data in this format provides the most flexibility and power in analyzing and curating the data. For a detailed discussion on this decision, see *Tools of Analysis*.

C. Tools of Analysis

Due to the large amount of data, Microsoft Excel will be the primary software used in analyzing data due to its ability to produce multiple styles of graphs as well as its provision of built-in filtering tools to further segregate data as needed. However, for collaboration between group members, Google Sheets will be used to store raw data, and possibly build graphs if the software allows for it. If deemed necessary, Python may be used for data retrieval to obtain more stylized results, but only in the event that data retrieved from the source has formatting problems due to using the provided export tool.

III. HYPOTHESIS

It has been hypothesized that initial funding will increase success in tech companies. Additionally, it is surmised that certain locations will see greater rates of success, while other locations see greater rates of failure. Furthermore, it is predicted that certain industries will result in greater rates of funding - likely the more established industries such as medical, finance, and consumer electronics.

IV. CONCLUSIONS

This study will indeed shine some light on contributing factors which make for a successful tech company. It is certainly the case that raw talent, determination, and original ideas play a major role in determining a tech company's ability to succeed. This study, though, should provide insight into the more subjective factor's which play into a tech company's success. Namely, it will reveal to what extent the carefully selected metrics contribute to the success or failure of a tech company.

By understanding how these metrics play into a tech company's ability to succeed (or whether they furnish the propensity to fail), further systematic study can be perfermed to determine the cause of this . If location is indeed a factor, it might then be necessary and possible to examine what contributing environmental factors might have possibly made a difference in regards to whether a startup did well or not in further studies. Ultimately, the data should provide a good idea of which contributing factors make the most difference in a tech company's success, barring factors that cannot be measured such as a single individual's potential and motivation to make the company succeed.

V. TIMELINE

Extract Data - 10/13
Organize Data - 10/27
Create Visual Representations of Data - 11/03
Analyze Results - 11/10
Complete Report - 11/30

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