
# HSBC Financial Technology Innovation Hackathon Competition

## Financial investment evaluation system

## Business plan

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| project name: | Financial investment evaluation system |
| Project manager: | 李竑緯 |

二〇一九年四月

# 一、Technological progress and use

### 1.1 Existing technology and resources

There is an unknown knowledge value in Internet financial data, but there is also a huge amount of data redundancy. Through Python, Internet financial data can be acquired, parsed, extracted, and stored. The method is flexible and diverse, and there are many open source libraries available. When using Python, you can determine the data you need to collect based on the actual research content. Python is the tool for obtaining Internet data and the cornerstone for analyzing Internet financial data. At the same time, the financial statements submitted by listed companies on time provide a good reference for the company's operational analysis.

### 1.2 Technical brief description of this project

The project technology is based on the company's annual financial report related information, through the integration of relevant information and the use of relevant financial calculation formula to obtain the asset-liability ratio, the five financial ratios, using data to show the operation of the company, and finally analyze the stock trend, comprehensive consideration to judge the company Is it worth investing? In the past corporate financial reports, due to the large number of projects involved in the report, the information is complicated, often requires us to spend a lot of time and energy to extract relevant information for analysis. In the existing financial analysis display, the results are often still only Separate projects such as “enterprise debt ratio” and “enterprise net interest rate”, although much more intuitive than direct reporting, are still not clear enough to show the correlation between the various items, so we are based on traditional analysis. Divide the data into four categories: “enterprise profitability”, “enterprise solvency”, “enterprise economic efficiency” and “enterprise financial structure”, so that major banks or investment banks can be more intuitive. Analyze corporate data more clearly.

In the data analysis of the financial report, if the basic data of the report is the first level data, the data calculated by the simple formula such as “debt rate” and “profit rate” is called the second level data, our analysis is intended to construct Based on the third level of data on “profit-making”, “solvency”, “economic efficiency” and “financial structure”.

The significance of the third-pole data is to integrate the second-level data and integrate the related second-level data to obtain higher-order data that is more intuitive, stereoscopic, comprehensive and easy to analyze for each enterprise.

In the construction of the third-level data, we combine the three core activities of the enterprise: “business activities”, “investment activities”, “funding activities”, and “balance sheet” of the financial statements, “profit statement” and “ The cash flow statement", extracting important second-level data is finally divided into four items.

**In the Profitability Analysis**，We selected operating gross profit margin, operating net profit margin, and return on equity and asset return rate as the basis to reflect whether the cost of the

enterprise is controlled, whether the business is profitable, and the financing ability and asset allocation efficiency of the enterprise. The three-dimensional explanation of the overall profitability of the company.

**In the "solvency analysis"**，We have chosen both the current ratio and the interest coverage ratio to reflect the ability of the company to repay short-term debt and pay interest, and to fully demonstrate the company's ability to face debt problems.

**In the "economic efficiency analysis"**，We selected the inventory turnover rate, accounts receivable turnover rate and total asset turnover rate to reflect the “money making” efficiency of the enterprise, the efficiency of marketing and the efficiency of the overall operation. The combination of the three aspects can make the analyst easier. Faster control of the efficiency of the entire enterprise.

**In Financial Structure Analysis**，We selected the owner's equity ratio and the debt ratio to reflect the proportion and role of shareholder investment or self-profit in the operation, as well as the debt situation of the entire enterprise, and generally show the financial structure of the enterprise.

# 二、Innovative methods and practicality

In the era of big data, data analysis is very necessary. People's judgment on a certain hypothesis is often based on data analysis. Data analysis can help people to formulate corresponding plans for the conclusions obtained. The organic combination of data collection, analysis, and simulation makes it easier for researchers to grasp the company's pulse and trends, giving the investment industry an investment reference, and allowing the company to realize its own potential problems and further generate solutions. Today, with the popularity of the Internet and the extensive Internet finance, it is possible to build a platform for data collection, processing and anticipation of integration, which will undoubtedly help more enterprises and individuals.

# 三、Project expansion space

In the current analysis, we combined four third-level data and used four data as criteria to judge the overall situation of the company. However, the current problem is to establish four standards for data assessment, so In the time, our aim is to extract data in real time, establish standards, and make it easier for investors to compare, judge and select different companies. Therefore, we will start from the following aspects:

**2.1 artificial intelligence**

Machine learning and deep learning have high accuracy in the prediction of time series data and have been widely used in financial institutions. There are a large number of studies to further improve the accuracy of financial data correlation models. In the future, the stacked neural network architecture in the AlphaAI project can be combined with financial statements to predict

the future price of multiple stocks.

Based on the architecture of the stacking neural network, you can use crawler technology to crawl articles about each company on the network, use natural language processing (NLP) to classify articles into positive and negative, and then use this data to join The weight of the neural network makes the prediction result more accurate.

**2.2 Quantification**

We intend to give investors the most intuitive judgment by establishing a score, so the next step is to “quantify” the four data. Profitability scores, solvency scores, economic efficiency scores, and financial structure scores are established by establishing formulas. And a total score of five. In the establishment of each score, we need to assign appropriate weights to the selected second-level data. In the simplest mode, we will distribute the average. What we need to do is to find the appropriate scale factor and establish a suitable one. Allocate the plan so that our analysis is more realistic.

After creating a score by creating a formula, we can get five scores, so investors can unilaterally understand the score status of each item and get the total score of the company. The digitization and fractionation of enterprise analysis will greatly simplify the analysis of the company and reduce the cost of analyzing the enterprise.

**2.3 Industrialization**

As we all know, different industries are likely to make a big difference in the representation of financial data, so it is unrealistic to unilaterally reflect the status of all enterprises with one standard. Therefore, in our analysis, we must more reflect the differences in the industry, and the comparison between the industry is more convincing. Therefore, in the subsequent improvement, it is also very important to establish different scoring standards for different industries and to establish an image to reflect the intuitive comparison of enterprises in the same industry.

# 四、Social and industry influence

With the development of the Internet and the popularity of mobile applications, Internet finance has been greatly developed, accompanied by large-scale data. Financial practitioners must obtain valuable information through data mining and big data analysis to complete accurate marketing. In turn, reduce marketing costs and improve performance. At this time, an important pre-work is the collection of data for subsequent data analysis, especially real-time data analysis.

Data analysis can make network marketing more smooth, according to the data appearing on the network, analyze people's needs, and then develop a consumer circle to ensure the greater benefits of network marketing. Therefore, data analysis is very important for people, and the emergence of data analysis software has brought a lot of convenience to people. According to the data analysis software, the existing data is reasonably and accurately analyzed, so that people want it. As a result, this is the charm of data analysis.