

# ***Financial Predictors Using the IRS Form 990***

*Frances Enid Rivera Henchys*

*Master of Engineering in Computer Engineering*

*Advisor: Othoniel Rodríguez Jiménez, Ph.D.*

*Electrical & Computer Engineering and Computer Science Department*

*Polytechnic University of Puerto Rico*

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**Abstract** — *The purpose of this project is to create a solution in the form of an application to the problem for finding sustainability in universities. Creating an application that states the financial predictors of any university in formulas solved this problem. These predictors were selected after revising and studying the IRS form 990. The IRS form 990 is the document that the IRS uses to gather tax information from organizations that are exempt from paying it and the necessary requirements to comply with tax laws. Universities are the focus of this project. The university that served as the guide to show that the calculations are correct was the Polytechnic University of Puerto Rico, from 2015 to 2017. As a result of this project, I found that finance is an important part of sustainability for any university. These predictors help universities know what area is lacking in findings and find solutions to increase it.*

**Key Terms** — *Financial Predictors, IRS Form 990, Solutions, Universities.*

## **INTRODUCTION**

Imagine being the founder of the first university. It makes a difference, especially in education. As time passes, the university grows in monetary reasons, such as income, tuitions, and student attendance. This growth also leads to the creation of other universities, making them competition. For the university to be economically stable so that it can continue to function, it needs to be informed of its financial stability and its sustainability.

Financial stability is described as the being resistant to economic shocks and being able to fulfill its daily activities [1]. Sustainability is defined as the ability to continue at a particular level for a period of time [2]. To find out about the university's sustainability, you can use the IRS

form 990. This document gathers the data of gross income, receipts, and other similar information to carry out the interval revenue laws.

For this project, the sustainability of a university will be calculated. This will be done using the IRS form 990 as a guide for the information, specifically the financial predictors. These predictors will be selected following the methodology written by Dr. Paul G. Leaman in his thesis titled Predictors of Private School Sustainability Using IRS Form 990.

The purpose of this project is to create a solution that will find the sustainability of an organization using financial predictors. Predictors are used as financial forecasts. These are described as an estimate of future financial outcomes for an organization [3]. These predictors will be in formulas that will calculate the sustainability.

The organization that will be used for this project is a university that has already written the IRS form 990 for. The data that will be represented as example for the application is from the IRS form 990 of the years 2015, 2016, and 2017. If an organization wants to be stable, it needs to know its sustainability to function properly and for years.

## **BACKGROUND**

To understand this study, it is important to have basic knowledge about:

- IRS Form 990
- Section 501(c)(3)
- Section 527
- Section 6033
- Gathering data
- Analyze data
- Predictors
- Sustainability

The IRS form 990 is a document that is filed by tax-exempt organizations, nonexempt charitable trusts, and section 527 political organizations [4]. This document is used to gather information about tax-exempt organizations, educating about tax law requirements, promoting compliance. It is also used as a medium to share information to the public about the organizations [5]. Tax-exempt is defined as income or transactions that are free from tax at the federal, state, or local level [6].

Section 501(c)(3) refers to political organizations that are identified in their tax filings with the Internal Revenue Service. The number "527" is a reference to the section of the tax code that governs these entities [7]. Section 6033 refers to Returns by exempt organizations. This means to file an annual return that includes gross income, receipts, and other similar information [7]. Gathering data and analyzing data are part of statistics.

Gathering data, or data collection, is the process of gathering and measuring information on variables of interest that enables one to answer stated research questions, test hypothesis, and evaluate outcomes [8]. Analyzing data, or data analysis, is the process of applying statistical and logical techniques to describe and evaluate data [9].

Predictors are financial forecasts for the purpose and use of this project. It is an estimate of future financial outcomes for an organization [3]. Predictors are also describing in the thesis from Dr. Paul Leaman and it states that predictors are these predictors are used as indicators in the formulas. Sustainability is the main purpose of making this project. It is the ability to continue at a particular level for a period of time [2].

## **PROBLEM**

The purpose of this project is to create an application that solves the problem. The problem is that they're not an easy manner to know if an organization is sustainable. The IRS form 990 is used to gather tax information but it does not establish if the organization is sustainable. To solve

this problem, the data that is gathered in the IRS form 990 will be used to calculate the sustainability of any organization that is a university. The data to be gathered will be from the latest three year, 2015, 2016, and 2017. The data will be compared, and conclusions will be created.

## **METHODOLOGY**

The first thing to do is to read the thesis that describes how to create predictors for the sustainability of private schools. These will serve as guides to select the predictors for universities. The second thing to do is to read the IRS form 990 to see and know the information that any university has to fill out. The section to focus is section 501(c)(3). The third thing to do is to read and familiarize myself with the term of sustainability.

The fourth thing to do is to decide the correct predictors to be used for predicting sustainability for universities. These predictors can be found by using the IRS Form 990. The fifth thing to do is to create the formulas to be used to calculate and find sustainability. The formulas will be created based on the predictors that were chosen to find sustainability in universities.

The sixth thing to do is to decide the type of application to create. It is important to know the type of application to create by knowing the advantages and disadvantages. The seventh thing to do is to decide the environment to be used to create the application. The environment will help to create a user-friendly program. The eighth things to do is to decide the programming language to create the code of the application. Every language has their advantages and disadvantages.

The ninth thing to do is to choose a university to test the application. It is important to decide on a university that has the three latest years available in the IRS form 990. The tenth thing to do is to test the application with the data from three years of the IRS form 990 of the chosen university. The eleventh thing to do is to present the application with the calculated results. The client must be satisfied with the application. If not, then

communicate with the client about the changes to be made or any correction that are necessary for the application or the project.

## RESULTS AND DISCUSSION

This project has significant contributions in the field of statistics. First, it was able to create an application that can use with financial predictors to calculate sustainability. Second, it is the first application to be created for the purpose of calculating the sustainability of universities. Third, it is an application where the user can clearly see any discrepancy between the years about sustainability. Lastly, it is an application that can calculate sustainability with only seven formulas.

To create this application, it was necessary to have knowledge of the IRS form 990, sustainability, financial predictors, tax-exempt organizations, data collection, and data analysis. The application was created using the programming languages of Java and the IDE from Netbeans. The other option for programming was with Ruby on Rails but it was not chosen. The reason for this is that there was not enough knowledge to create an application that met the requirements.

The other options for creating the application were Google Web Services, Eclipse, and Amazon Web Services. The reason that Google was not chosen was because there was not enough knowledge to use Google App Engine and other features. The reason for not using Eclipse was because the program did not install correctly. The reason for not selecting Amazon Web Services as the environment was because it did not accept the java file in the environment.

The requirements for the application were the following:

- Calculate income as total current fund revenue.
- Calculate expenses as total current fund expenditures.
- Calculate assets, liabilities, and fund balances as over current fund expenditures, as current fund balance (previous year), as total liabilities, and as total assets.

- Calculate Fund-raising as total gifts.
- Compare for three years.
- Create an application that shows the formulas and inputs for three years of the chosen university.

The equations that were used for this project were the following:

- **(1):** Total Current Fund Revenues = (Tuition + Fees) + (Federal Appropriations) + (State Appropriations) + (Federal Grants) + (Private Gifts) + (Support for Operations) + (Auxiliary Enterprises) + (Sponsored Research)
- **(2):** Total Current Fund Expenditures = (Instructional Expenditures) + (Full-time Student) + (Academic Support) + (Marketing Expenses)
- **(3):** Over Current Fund Expenditures = (Deficit Current Fund Revenue)
- **(4):** Previous Year's Current Fund Balance = (Current Fund Balance)
- **(5):** Total Liabilities = (Long-term Debt) + (Total Assets)
- **(6):** Total Assets = (Market Value of Endowment)
- **(7):** Total Gifts = (Gifts from Individuals) + (Gifts from Organizations) + (Planned Giving) + (Annual Campaign)

These formulas were created for the application to look as shown in figures 1, 2, 3, 4, 5, 6 and 7:

**Figure 1**  
**Total Current Fund Revenues Page**

**Figure 2**  
**Total Current Fund Expenditures Page**

**Figure 3**  
**Total (Over) Current Fund Expenditures Page**

**Figure 4**  
**Current Fund Balance Page**

**Figure 5**  
**Total Liabilities Page**

Each formula was created to calculate a specific financial predictor of the university. Equation (1) was created to calculate the income of the university. Each parenthesis has a predictor that indicates a specific income. Equation (2) was created to calculate the expenses of the university.

Each parenthesis describes a predictor that was related to an expense. This included the institution, marketing, and students. Equation (3) was created to calculate the expenditures of the university. The parenthesis includes the deficit as a predictor of the university.

**Figure 6**  
**Total Assets Page**

**Figure 7**  
**Total Gifts Page**

Equation (4) was created to calculate the financial balance of the university. The parenthesis includes the balance income as a predictor of the university. Equation (5) was created to calculate the financial liabilities of the university. The parenthesis includes the market value as the predictor of the university. Equation (6) was created to calculate the financial assets of the university. Equation (7) was created to calculate the financial gifts the university received and planned to give. Each parenthesis includes a specific financial predictor of the university. These includes received gifts and gifts planned to give.

The formulas were tested using the data from the IRS form 990 of the Polytechnic University of Puerto Rico for the years of 2015, 2016, and 2017. The data that acts as an input for the predictor can be found in the IRS form 990. It is important to

know that not all of the data for each predictor can be found.

This means that not all of the information can be found in the IRS form 990 and that there are other documents where the universities inform their taxes. An example of a formula not including all of the predictors can be seen in figure 8.

|                        | Year 1          | Year 2          | Year 3          |
|------------------------|-----------------|-----------------|-----------------|
| Tuition and Fees       | 31049374        | 3010244         | 30737201        |
| Federal Appropriations | 0               | 0               | 0               |
| State Appropriations   | 0               | 0               | 0               |
| Federal Grants         | 2774117         | 3714966         | 4523737         |
| Private Gifts          | 0               | 0               | 0               |
| Support for Operations | 0               | 0               | 0               |
| Auxiliary Enterprises  | 562123          | 604339          | 634638          |
| Sponsored Research     | 0               | 0               | 0               |
| <b>Total</b>           | <b>34385614</b> | <b>34421754</b> | <b>35895576</b> |

**Figure 8**  
Total Current Fund Revenue Page with Data

Figure 8 shows the formula of Total Current Fund Revenue with data inserted, but not all of the data is there because there are zeroes instead of the correct data. The zeroes indicate that there was no data found for that specific predictor. However, this lack data does not mean that there is no data to be seen for the sustainability. Figure 8 shows that from Year 1, 2015, to Year 2, 2016, there is less of total income for Year 2 than there is for Year 1. In the case of Year 2, 2016, and Year 3, 2017, there is an increase of income.

As a summary for all of the totals of each formula, there is a summary page (figure 9). This summary page helps to analyze the results of each formula and to conclude if the university is sustainable.

|              | Year 1 | Year 2 | Year 3 |
|--------------|--------|--------|--------|
| Income       |        |        |        |
| Expenses     |        |        |        |
| Expenditures |        |        |        |
| Balance      |        |        |        |
| Liabilities  |        |        |        |
| Assets       |        |        |        |
| Gifts        |        |        |        |

**Figure 9**  
Summary Page

After reviewing, testing and documenting, I found that there would be results from the formulas that will be of sustainability for the university. Although not all of the formulas will have all of the data for the specified predictors, it does not limit the formulas from concluding to give results for sustainability. These results can give an idea to where there are gains and where are the losses. The gains have to be analyzed to continue improving sustainability while the losses will have to be identified to take immediate action in decreasing losses.

These results are important findings for sustainability because it shows that it can be calculated with the correct predictors. This means that there are now seven different formulas to help the IRS determine if an organization is sustainable and will have future gains so that the organization can fill out the IRS form 990. The results also show that an organization can become sustainable by identifying what is the factor or what are the factors that are making the organization lose income or gain unnecessary expenses. These findings have shown that any organization can calculate its own sustainability with the help of the IRS by retrieving the correct data, that will become predictors in the formulas, and calculating with the seven formulas.

## CONCLUSIONS

The application can help predict sustainability for any university using financial predictors. The application works as a desktop program for Windows and Mac computers, it is easy too use and shows the results instantly. The sustainability is calculated using income, expenses, assets, liabilities, fund balances, and fund-raising from the IRS from 990. This form is useful because it gathers the data from any organization that is of section 501(c)(3), tax-exempt organizations. Using the latest three years of IRS form 990 data from the university can successfully predict if the university is sustainable.

## FUTURE WORK

What is next to be done for the project is the following:

- Add economical predictors
- Add social predictors
- Add environmental predictors
- Gather data from five years instead of three
- Add more in-depth information
- Develop the application to work in more than one platform
- Add more user-friendly features
- Create more formulas to calculate sustainability

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