RESEARCH GRANT FINDER FOR STAFFS OF FACULTY OF COMPUTING

ISLAM MOHAMMED RUZHAN

UNIVERSITI TEKNOLOGI MALAYSIA

Contents

1. Introduction

Research is a very time-consuming as well as an important task to do. Almost all the universities in this world have researchers who research in various topics of science, commerce and education. Many new ideas are introduced through this research which make an impact in various fields. But for research one of the most important things is fundings. Research cannot have an impact if there is no funding. A research process has a lot of things to fund for example, staffs, equipment, testing, data collection and many more. These are borne by some funding organizations, who need new ideas to work on and need scientists to develop new things. So, the research funding organizations fund various research, which they find promising. It is quite hectic for the researchers to search for funding according to the topic of their research. They have to manually look through hundreds of websites to find the most appropriate funding which is very time consuming, and it may cause a negative impact on the research quality.

To reduce the hassle of searching for research in a complex process, many websites are developed which contain the funding information of various funding organizations. In these websites various research grants are available in a single platform. These websites collect research grant data from various websites and take them as inputs and store them in the repository. The systems get the information form this repository when requested by the user. The user can search for grants by filtering according to his research. The grant data will be shown in a dashboard including the grant statistics, most popular grant types and grant amount.

To develop a research grant finder for the School of Computing, UTM, it is necessary to analyze and understand similar existing systems. By analyzing the existing systems, we can get an idea of the systems and we can know the limitations of the systems and solve those limitations in the proposed system. Finally, we can develop the system using python for web scrapping and a database language to store the data in the system repository.

2. Current System Analysis

Currently there is no automated system for the researchers to search for research grants. The researchers who want grants have to go through the RMC website of UTM and look for grants. But RMC is a manual process, where grants are added manually, and there is less chance of getting the latest grants and the number of grants found is also less. Other ways the researchers use to look for grants is the websites of different funding organizations. But this is also a very hectic process. There are hundreds of grant funding organizations, with each different types of grants. So, it is not possible for the researchers to go through all the grants. It consumes a lot of their time. And it also reduces their chance to complete the research within the due time.

3. Comparison between existing systems

To develop a perfect system with the possibility of least errors, we have to analyze the existing systems that also use the same techniques and are used for the same application. In this way we can identify the shortcomings of the existing systems and try to solve them in the system we plan to develop. There are many websites that contains information about different types of grants. They use different techniques to store the grant data. Some use web scrapping, others store the data in the server using database. Some similar systems that enable researchers to search for grants are discussed below:

3.1. GrantForward

GrantForward is a grant searching tool that collects and arranges data on available grants from a variety of sources, including governmental bodies, foundations, and other organizations. GrantForward is a useful tool for academics, scientists, and scholars looking for financing for their projects and studies since it gathers data on hundreds of grants and funding possibilities using web scraping technologies.

Features:

- Search engine
- Advanced searching option
- Ability to filter search based on different grant category.
- Allows users to track the grant of their interest and receive updates.

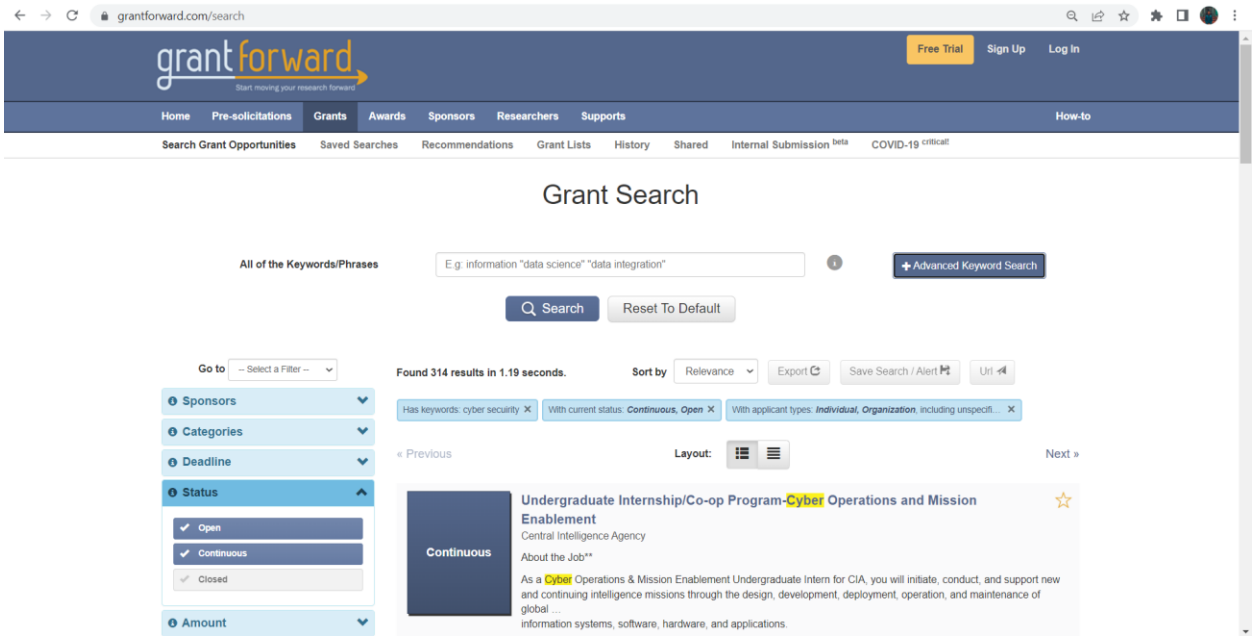

Figure 2.4.1.1: Interface of GrantForward

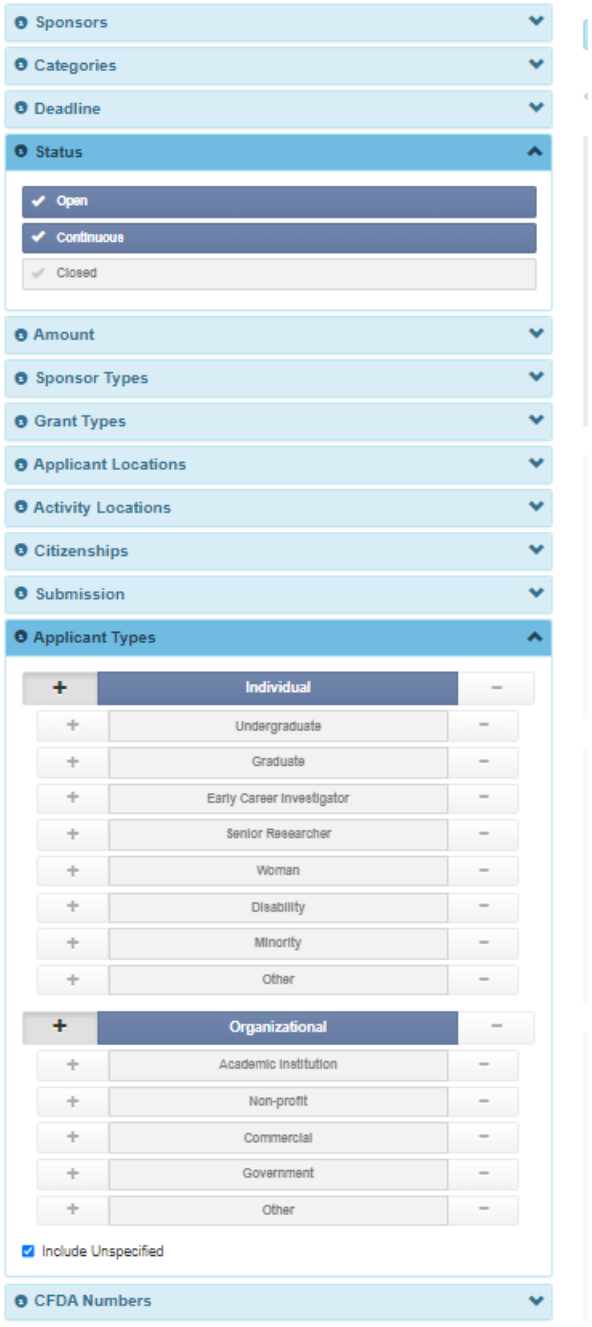

Figure 2.4.1.2: Filters of GrantForward

While GrantForward is a very useful tool for researchers and academics, it has a complex user interface, and the number of international grants is limited in this system. Also, it is a paid service so, it will cost some extra money for searching suitable grants. But if the School of Computing has their own research grant finder, the researchers of UTM need not to pay any extra money.

3.2. Grant Watch

GrantWatch is a subscription-based service whose users get access to data about grants and financing possibilities. The platform collects data from several sources, including governmental organizations, foundations, businesses, and organizations, using web scraping techniques and then presents it in a user-friendly manner. For a number of sectors including education, healthcare, the environment, the arts, and community development, the website provides a wide range of options for funding, such as grants, fellowships, scholarships, and prizes.

Features:

- GrantWatch has a vast database.
- Database updated regularly with new grants.
- It has filter option in searching, through which the users can easily narrow down their search according to their research area.
- This system also gives email alerts to the users regarding important grants. The grants are categorized according to the fields.
- Easily navigable and easy to access information.

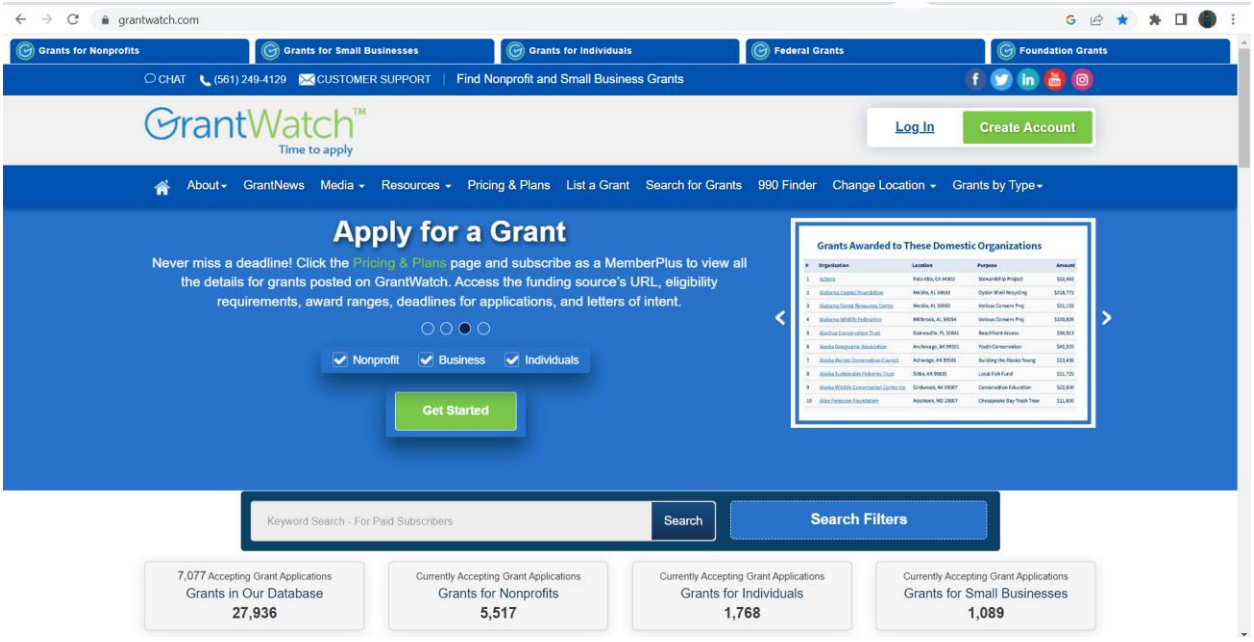

Figure 2.4.2.1: Interface of GrantWatch

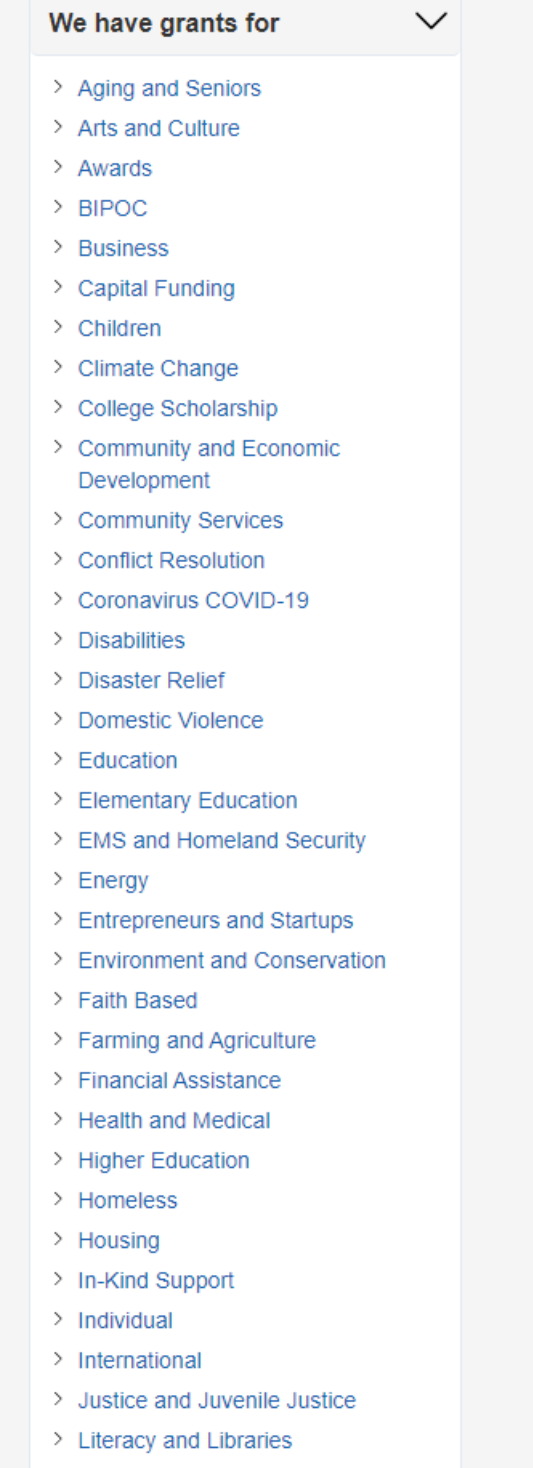

Figure 2.4.2.2: Fields for GrantWatch

But GrantWatch is a paid service, the users cannot search using specific keywords without paying a certain amount. Moreover, the grants regarding computer science field is less as seen in

the system. There is no guarantee that after payment the subscriber will get the type of grant he wants. There are also chances of outdated grants due to delay of updating the database.

3.3. Grants.gov

It is a website to search for and apply for the grants provided by the US government. It provides various grants inside and outside the United States. No subscription is required to look for grants in this system.

Features:

- Users of the website can do grant searching using keywords, sources of funding, grant categories, and application deadlines.
- Also, users can set up a personalized account to store searches, monitor applications, and get alerts about new grant possibilities.
- Provides guidelines on how to apply for grants.
- It is a grant provider of the US government.
- It provides grant for federal projects.

Though grants.gov is one of the biggest and oldest grant providing websites, it has some problems, which include unavailability of grants other than from USA, there is a filter search option but it is too complex and there has been reports that the filters are not much effective.

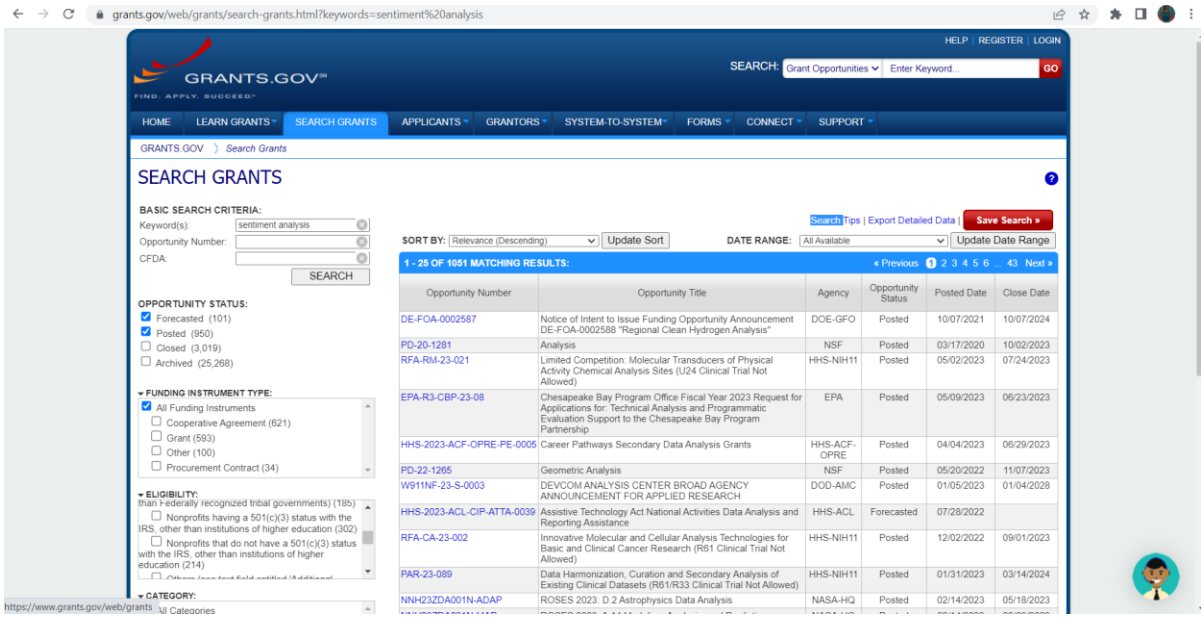

Figure 2.4.3.1: Search results in Grants.gov

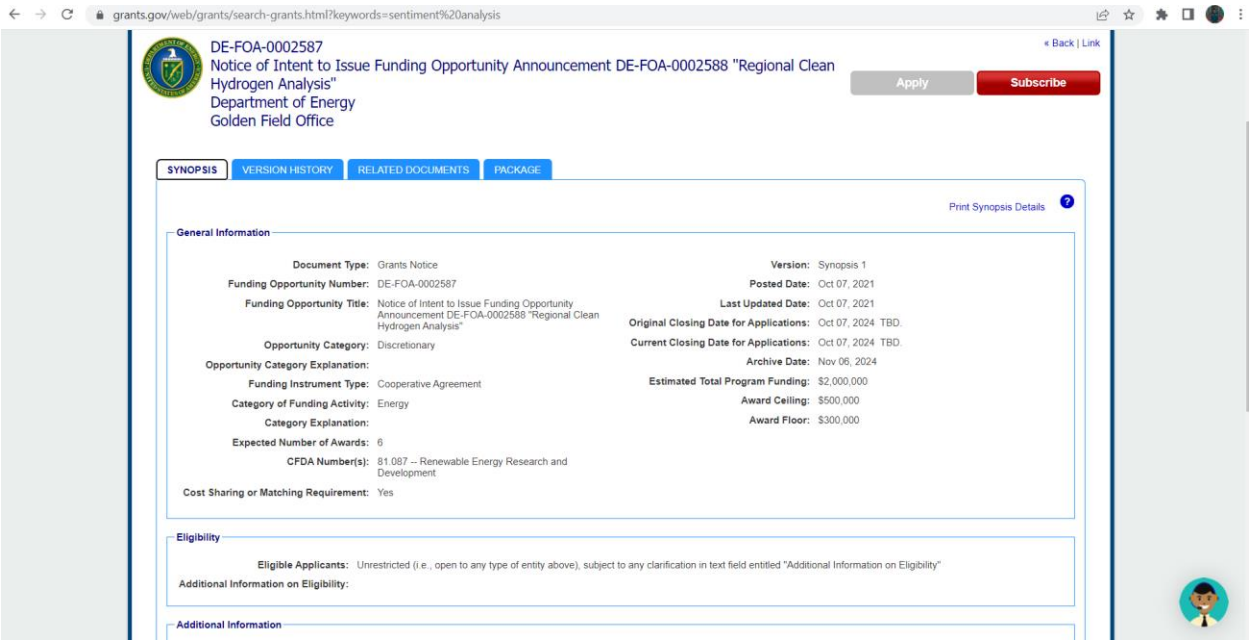

Figure 2.4.3.2: Grant details in Grants.gov

Table 2.1: Comparison Table between existing systems and FC Research Grant Finder

	GrantForward	GrantWatch	Grants.gov	FC Research Grant Finder
System Type	Web	Web	Web	Web
Web Scrapping	Full	Partial	Partial	Full
Repository	Yes			Yes
Dashboard	No	No	No	Yes
Data Analytics	Not Used	Not Used	Not Used	Used
Information	Less information, well organized	Organized information	Huge information, not organized	Well-structured and organized information
Subscription	Yes	Yes	No	No
Filter search	Yes	Yes	Yes	Yes

User Interface	Simple	Easy to navigate	Complex and hard to navigate	Simple and easy to navigate
Chatbot	No	No	Yes	No
Language	English	English	English	English
User friendly	Yes	Yes	No	Yes

All the systems use filtering methods to search for Grants. Not all websites use web scrapping to extract grant data. All of the existing systems and the to-be developed system are web-based systems. None of the existing systems contain dashboards for data analysis of the grants. The FC Research Grant Finder will analyze the grants data obtained from various sources.

4. Literature Review of Technology Used

Burgelman et al. (1996) refer technology as the theoretical and practical knowledge, skills, and artifacts that can be used to develop products and services as well as their production and delivery systems. To develop a system properly we need to use different kinds of technologies. In this age of advancement in science, technology is changing at a very fast pace. So, we need to use such technologies which is not easily replaceable, and which can adapt to changes. We will use the following technologies for the FC Research Grant Finder:

Frontend:

HTML:

Html bears the skeleton of a website. Since FC Research Grant Finder will be a web-based project, it is a must to use HTML.

CSS:

CSS will be used to beautify the front end and the dashboard of the system and to make some transitions and effects.

JavaScript:

JavaScript adds dynamic behavior to the webpage. It is used for validation purposes and sending prompt messages to the user.

Backend:

Python:

There are many Python frameworks that can be used in backend to work with the database and with the front end of a system such as Django and Flask

Web scrapping:

Python:

It is used to extract data from websites. There are many libraries in python which helps with this technique.

Database:

MySQL:

MySQL is a database management system that can be used to modify, delete, create and store data. It is a must for every dynamic website.

Visual Studio Code:

Visual studio code is the editor for writing source codes. Codes in different languages are written and run using an integrated development in Visual Studio Code.

5. Chapter Summary

Chapter 2 provided detailed study of the research grant finder systems that exist around the globe. The advantages and shortcomings of the existing systems have been discussed and a comparison has been done with the proposed FC Research Grant Finder system so that, a proper and impactful system can be developed for the Faculty of Computing (FC).

References

Bogler, R. (1994). The impact of past experience on people's preference: the case of university researchers' dependency on funding sources. *Higher Education*. https://doi.org/10.1007/bf01383727

Burgelman, R. A., Maidique, M. A., & Wheelwright, S. C. (1996). Strategic Management of Technology andInnovation. (2nd ed.). Chicago: I. L, Irwin.