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**CASE STUDY 2**

**PROBLEM DESCRIPTION**

**Database for Organizations providing Student Scholarships -**

Consider an organization that provides **scholarship** to Students based on **different criteria**. These scholarships are sponsored by different **people** and **organizations**. Each of them may provide different criteria for scholarship. Some prefer Students with good **academic performance** others prefer to provide scholarships to students going for **foreign education and some to poor and needy students**. Design and develop a system that efficiently handles all these features.

**Need of a centralized system:**

A scholarship is an important component concerning education for an individual. For some, the scholarship serves as a means of motivation and for others it makes education possible by providing financial support. There are many types of scholarships available.

**Workflow of the scholarship process :**

A scholarship applicant fills out the form and details for the scholarship programme. He/she also needs to provide relevant documents like transcripts, letters of recommendation, etc. The organisation then filters the students according to a predefined criteria. The students who fulfill the criteria are selected for the scholarship. Many a times, the scholarship provider needs to sort the students in decreasing order of their academic merit and select the top, say, 20. Then the students are informed of their selection and an offer is made to them. If the student accepts the scholarship, then the required funding is provided.

The funding process can also vary from one organisation to another. Usually, the student needs to pay the fees/travel fare/accommodation charges beforehand. Later on, the scholarship provider reimburses either the full cost or a partial cost of the financial expenditure.

**When is such a system used?**

Scholarships are provided by organisations throughout the year. However, most academic scholarships are provided after the start of the academic semester(needs to be confirmed ). Certain international internship scholarships for undergraduate students open their portals in November-December period. A survey needs to be conducted to predict when the load on the system will be at its peak.

**Types of scholarships:**

There are a number of types of scholarships:

1. merit and academic scholarships
2. research scholarships
3. minority scholarships (caste and women)
4. need based scholarships
5. sports scholarships
6. community service scholarships
7. first in family scholarships
8. legacy scholarships
9. military scholarships
10. Mens and moms scholarships
11. Special talent scholarships

All these scholarships are available for students from different backgrounds. Some scholarships are based on academic performance, while some are based on ethnicity. There are scholarships for students who require economic assistance. Some scholarships are provided for those who provide possess specific skills in sports or arts.

In conclusion, it is important to inform students about the different types of scholarships and help them in deciding which one is best suited for them.

**Entities involved:**

The main entities involved will be:

1. **Schools, colleges and universities**

Schools, colleges and universities will be associated with the students. It will be the responsibility of our organisation to handle the funds and ensure that they reach the schools, colleges and universities.

2. **Students**

Students will be the ones most benefited from this software as they can apply to various scholarships through one central system.

The students can be distinguished according to different parameters :

1)Level of education–

Students can be categorised in the following classes :

1. School student
2. High school student (11th and 12th std)
3. Undergraduate student
4. Graduate student
5. Post-graduate student

Undergraduate, graduate, and doctoral students each have specific financial needs. While there are some general scholarship programs that may be applicable to all students, the majority will be specific to student type and will only be available to students at a particular level of their college career. It is not uncommon for first time scholarship seekers to track down a promising program, only to find that they are ineligible because they are not at the specified degree level. In addition to degree level, many scholarships are designed to target students pursuing a specific major or course of study. These subject-specific awards make up a large part of the scholarship field, and students with definite career goals are likely to have better luck in their search for scholarship opportunities.

2) Field of study –

Students have different fields of study like the ones mentioned below :

1. Engineering
2. Medicine
3. Commerce
4. Arts(music, dance)
5. Literature

Most scholarship providers are looking for specific criteria when handing out awards. These criteria can range from excellent writing to original thinking to great research skills to demonstrated commitment to service. The characteristics sought by specific scholarships may also align themselves well with particular majors. English, journalism, and philosophy majors may find themselves excelling at essay scholarships, as their writing-intensive coursework and demanding reading assignments prepare them uniquely for the task. Competitions that ask for original artwork or designs are likely to draw art students, fashion majors, and design majors who have experience and interest in creating something new. Students most familiar with the rigors of scientific research and engineering projects will shine at competitions that emphasize those skills, even if they are open to students of all academic backgrounds.

3. **Scholarship providers**

Various government and private funding companies help in providing the funds.

Types **:**

1. Company sponsored or Private scholarships –

There are so many large companies that believe in investing in education — so much, in fact, that they’ve dedicated foundations to sponsor scholarships for students. These organizations offer great opportunities for high school, and sometimes college students, to win money to help pay for their dream school. These scholarship programs often target women and minorities as a way to diversify the growing workforce. Many of these scholarships will also be dedicated to students pursuing a specific career path that is closely linked to the sponsoring corporation.

Some of them are -

* Food and soft drink manufacturers
* Pharmaceutical manufacturers
* IT companies
* Investment and commodity brokers
* Insurance underwriters
* Restaurants and retail chains
* Industrial firms

2. Government funded scholarships –

Many countries have their state governments provide scholarships for students based on merit, financial condition and their future goals. All these criteria depends on the funds of the existing governments and to what extent they want to help the students. Some of these are –

1. National government scholarship
2. State government scholarship
3. Civic government scholarship
4. Inter-government scholarship (Some international scholarships are provided by organisations formed by two countries).

**4. Software Manager :**

We need a software manager to verify new funding organisations to the system and to maintain the software.

**Current System:**

In the current scenario, we are assuming that there exists no software solution for a centralised scholarship portal. Each scholarship provider has its own Such a system experiences a number of drawbacks which are listed below :

**Drawbacks in current system :**

1. Student needs to apply to numerous organisations multiple times -

Students have to apply for various scholarships and filling out their basic personal informations for very scholarship program is a tedious task.

1. Lot of paperwork for the organisation - man hours wasted

Filling of various forms by the applicants and their evaluation by people leads to lot of paper-work and human labour which can be avoided by using an online system.

1. Matching the student with the criteria required by the organisation takes time.

It requires a lot human strain in verifying the documents and finding if they are qualified for the scholarship, this is next to impossible considering the huge amount of applicants.

1. Student is unaware of scholarships for which he is applicable

Currently, information about scholarships spreads through newspapers, pamphlets and word of mouth. However, there is no central repository which can assimilate all the information about scholarships. As a result, students have a hard time finding about scholarships and keeping track of the deadlines.

1. Students needs to send multiple documents for different organisation

Students usually apply to different organisations and the documents required are usually the same. The student faces a lot of inconvenience because he/she has to submit the same documents to numerous organisations.

**Features provided:**

1.A centralized system to view all available scholarships

Many a times, students spend a lot of time searching for scholarship information. Because of less publicity, some scholarships are not known by students. Spreading awareness of scholarships is an important feature of the application.

Additionally, it will be easier for the applicant to search for different scholarships at one place.

He/she can gauge his options and apply wisely to scholarships where he/she has a good chance of getting selected.

The centralized system will be helpful to the scholarship providers too. They need not spend their resources in making a reliable software for managing the scholarship process.

2. Two types of accounts – one for applicant and another one for scholarship provider.

The software platform will have two types of accounts - one for the applicant and another one for the scholarship provider organisation.

3. Authentication and storing relevant documents at a single place

A student may apply to a number of scholarships because he is not sure whether he will get selected in a particular scholarship. In this case, he/she will have to fill the application form for each scholarship individually. Instead if the student uses this software, he/she can fill all his personal and academic details only once. This eases the application process.

4. Previous years records of successful scholarship recipients(If possible)

Many a times, a student would like to know about his/her seniors who got selected in scholarships in which he/she is interested in. If such records of previous scholarship applications are stored in the software and provided on the website, then it will be easier for the student to gauge his/her chances of getting selected.

5. Duration of internship scholarships and matching it with student’s academic calendar

The academic calendars of different universities and colleges is not the same. The system should ask the student about the preferred duration of internship scholarship and provide recommendations(possible options) accordingly. Furthermore, while validating the student’s academic information, it should ensure that the academic calendar of the student’s college does not conflict with the internship duration.

6. Acceptance/Rejection of scholarship

After the scholarship provider has offered a scholarship to a particular student, the student may or may not accept the scholarship. Such a scenario arises because the students may apply for numerous scholarships because they may not be sure of getting a particular one. If a student is accepted for multiple scholarships, he may have to reject some because of time(internship during same period) or law constraint(The Government provides various scholarships for poor and needy students. However, at a given point of time, the student can avail only one such scholarship).

The system needs to ensure that the student has the option of rejecting the scholarship.

7. Selection of students from a pool of candidates based on different criteria

In order to filter the candidates who have applied for the scholarship, the scholarship providers have different criteria. In some cases, the criteria are simple enough to be modelled within the software system and don’t need outside support. For example, consider a scholarship provider which selects the student with 1st rank from each of the IITs in India. This selection criteria is fairly easy to model and can be programmed easily.

However in some cases, the scholarship provider’s subjective inputs are needed for filtering. For example, consider a summer research scholarship for undergraduate students. For such a system, the candidate enters his research profile and lists his research experiences in a subjective manner. It is very difficult to model a software to compare the research profiles of two candidates. Furthermore, professors from the scholarship provider university might want to select candidates by checking how closely the candidates match with the professor’s research interests. In such a scenario, the system needs to provide the relevant information to scholarship provider and accept their response in an appropriate manner.

8. Status updation communicated to applicants

If the application status of an applicant changes, then the applicant is informed of the decision through email. Further actions for the applicant can be communicated well in advance. For example, if an organisation wants to conduct interviews as a part of its screening process, it can inform the candidate about the date and time through email.

9. Screening test for scholarship(If possible)

Some scholarship providing organisations conduct a screening test for the applicants. Based on the results of the screening test, the organisation selects candidates and awards them the scholarship. Currently, the organisation conducts the screening test offline. It needs to evaluate the results and select candidates accordingly. Instead of spending resources like time and money to conduct the test, the organisation can conduct the test on the software platform itself.

10. Provision of online interviews(If possible)

Many a times, the scholarship providing organisation needs to conduct interviews to filter out applicants. Currently, the system may conduct the interviews on skype or gmail. However, it would be more convenient if the interviews could be handled by the software platform itself. After the interview, the scholarship provider can rate the applicant and accordingly change his/her status.

11. Online transactions for providing scholarship

Currently, the scholarship providing organisation provide the scholarship funding through checks. Delivery of checks (or other physical procedures for transferring money) to students is a cumbersome process. Instead the organisation can use internet banking facilities to transfer the account to the student’s bank account. The details of the students’ bank account can be stored in his/her profile.

12. Forum for discussing queries related to scholarship application(If possible)

Scholarship applicants often have numerous queries related to the scholarship application process. A forum for discussing such queries in the software can help the students to clear their doubts.

**Anticipated challenges:**

1. Different types of requirements for different types of scholarships:

As explained previously, there are a number of scholarships and they fall into different categories. Hence making a general software which manages the scholarship process is a difficult task.

2. Good search system for applicants to find scholarships for which they are applicable:

There are so many types of scholarships having different criteria, suggesting the best scholarships applicable to them is a challenging task. Even the best search algorithm could face issues in providing accurate results.

3. Management of finances in a reliable way:

There are various organisations providing funds for students and managing all the finances would be hectic because those organizations need to provide the funds on time so as to meet with the deadlines of paying the college fee.

4. Verification of documents with actual records:

Nowadays students are providing false documents in relation to their financial situation just to satisfy the criteria for various scholarships. These need to be validated which would be a tedious task. Even the college transcripts could be fallacious and many other documents could be erroneous.

5. Management of finances across international boundaries

The scholarship provider may be an international body formed by a pact between the government of two countries. For example, consider the Viterbi-India program which gives Indian students scholarship for spending two months at the Viterbi School of University of Southern California. The scholarship is given by IUSSTF - Indo-US science and technology forum which is an international organisation supported by Indian and US governments.

In such a case, the finances need to be managed across international boundaries. International laws for transfer of money need to be considered.

6. Iterations for a particular scholarship

If the student rejects a scholarship, then another student who qualifies for the scholarship should be awarded the scholarship. Hence a waiting list needs to be maintained and iterations(rounds of selection) for a scholarship need to be performed. For example, MITACS globalink research internship scholarship.