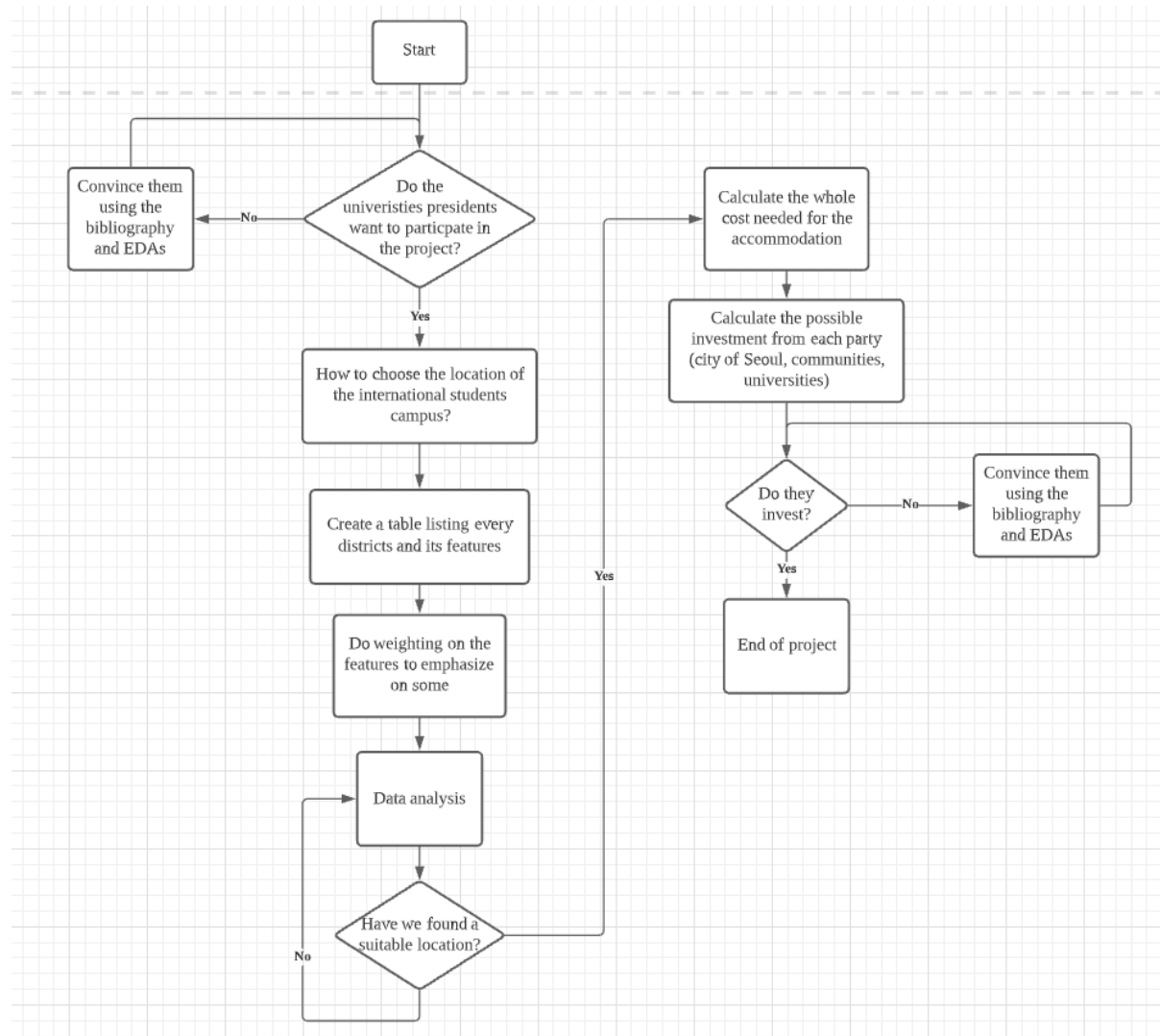


[Design Sketch] BOIDOT, AUGUSTIN / Lee, Hyeon Dong / Jeon Yeeun

Project: International Student Accommodation

[Diagram]



[Pseudo Code]

1. Use bibliography and EDA to persuade the presidents of universities

We can use bibliography that international students can bring universities financial advantages, and we can also use the EDA of financial soundness of universities. Also use bibliography that students prefer accommodation rather than getting a house on their own, so that we can attract many international students by building the accommodation. Use or find more academic journals or reputable news organizations to justify why we have to build the accommodation.

2. Choose the location of the accommodation

(1) Load Foreign student data in university

(2) Select regional scope appropriate to build the accommodation.

Select 3 regions with the largest number of foreign students and mark with dots, and make a triangle with these dots as vertices

(3) Give a value for each feature of district

After defining the triangular area, we would like to select the most suitable districts to build the accommodation. To do so, we should give a grade of between 0 and 1 for each feature of each district, the selected features being the number of international students, rent price, budget magnitude, crime rates and cultural richness.

If the region is positive about the feature, it will get 1 point, and if it is negative, it will get 0 point. Next, set weights for features. For example, in the case of crime rate, we put the weight as 3 point because it is one of the most important parts of setting up a residential area, and in the case of rental price, it is one of the relatively less important parts (because we receive investment) so we give 1 points.

{ Weight of each feature

rent price : 1

number of international students : 3

budget magnitude : 2

crime rates : 3

cultural richness : 1

}

Then multiply the weight score by the square of the points. The reason for squaring the points here is to further maximize the weight. (The difference between 0.01 squared by 0.1 and 0.02 is only 0.03 points. However, 0.081 squared by 0.9 and 1 squared by 1 differ by about 0.19. As the score increases, the difference will widen, and the weight will be more emphasized.) The more negative the score, the closer to zero, and the more positive the score, the greater the score.

(4) Sum up the values

Doing feature engineering, create a new feature called the district suitability index where we sum the values associated to the 5 above mentioned features for each district which will be an index.(0-10)

$$\sum_{n=1}^5 \omega_n \times a_n^2$$

(w is the weight point, and a is the point of the feature)

(5) select some possible districts for accommodation

Keep only districts whose suitability index is superior or equal than 7. If there is no score higher than 8, lower the standard.

(6) Consider amenities in the selected districts

As amenities are not one of the most important features when looking at a district, we firstly select suitable districts using the other features and then use amenities to get the best prospects.

(7) Choose the final district where we should build the accommodation.

(8) Search data for unused land in the district and finally select the location for the accommodation.

3. Justify the financial investment between City of Seoul and University of Seoul.

(1) Calculate the number of students who need accommodation.

Sum up the international students in the universities in Seoul, and then subtract the number of students who can be accepted in the current university's dormitory.

By using the bibliography, we should consider who are the actual students who need to be in accommodation. For example, some students prefer getting a house individually rather than staying in accommodation. Not all students want to be in accommodation.

(2) Calculate the financial aspects to build the accommodation.

* Land price : Because we have only house price data, we can calculate the land price roughly by using EDA6(the correlation between house features and house price).

*Building price: Consider the number of students who need accommodation and calculate the cost needed to build the building that can accept the students. Use academic journals about architecture and policies about building accommodation to calculate the cost.

(3) Calculate how much the City of Seoul can support us.

According to the book written about the budget in Seoul ('2021 Budget School'-Bibiliography), when we propose a business for Metropolitan area unit, we can be supported by City of Seoul 4 billion won in maximum.

(4) Search for other communities if they can support us.

Search communities related to international students and foreign people and see if they can invest to our project.

(5) Calculate how much the universities in Seoul have to invest.

(The whole total cost needed to build the accommodation) – (financial investment from city of Seoul) – (Financial support from communities) = (The cost that universities of Seoul have to be in charge of)

(6) Calculate how much each university has to invest.

Consider the number of international students in each university and the distance from each university. Based on the number of international students who need to be in the accommodation and the distance to the accommodation from each university, predict how many students of each university will use the accommodation. Proportional to that data, calculate how much each university has to invest. The university that many international students are expected to use the accommodation will invest more.