



NEST ABROAD CO.
DBA3702 BUSINESS COMPANY

BUSINESS PLAN

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SA2 Team 5

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1. Introduction

1.1 What is NestAbroad? – Company Description

At NestAbroad, we believe that studying abroad should be an exciting adventure, not a stressful hassle. With a vision to disrupt the market by simplifying the process of finding accommodation, NestAbroad provides a platform that allows students to easily search for and compare various accommodation options. Our team hopes to empower students to make informed decisions about their study abroad experience. Our ultimate goal is to help every student find a comfortable, affordable, and safe place to call home during their time abroad.



Tagline	Securing your next Home-Away-From-Home
Mission	Simplifying accommodation search for exchange students

1.2 Target Market/ Audience

With the relaxation of pandemic restrictions, Student Exchange Programmes (SEP) are back in full swing. At the National University of Singapore (NUS), approximately 2000 students embark on SEP annually (NUS Global Relations Office, n.d.). Likewise, NTU and SMU send around an estimated combined total of 3,700 students on exchange annually (SMU, 2023; NTU, 2023).

NestAbroad's target market would be Singaporean students going for an exchange in Vancouver, Canada. This is because Vancouver's rental market has high demand, yet is notorious for being challenging to navigate (Wilson, 2022).

Furthermore, Vancouver and Singapore share many similarities in terms of housing needs, which is why our app will primarily focus on this market initially, before expanding to other cities and countries in the future. With both cities having a high cost of living and an expensive rental market, it can be challenging for students to find affordable and suitable housing.



Lastly, Vancouver's large international student population and reputation make it a desirable study abroad destination amongst Singaporean students, which makes it an ideal location to launch our app. If successful, it could provide a strong foundation for expanding into other markets in the future.

1.3 Current Market Practice and Pain Points

Currently, the University of British Columbia (UBC) is NUS, NTU and SMU's only partner university located in Vancouver, Canada. Unfortunately, exchange students going to UBC looking for accommodation have to rely on multiple sources of information to find suitable housing options.



Figure 1 Current Market Practices by Singapore exchange students

As such, the process can be highly time-consuming and presents the following pain points for Singaporean exchange students:

Firstly, there is a lack of consolidated information on available housing options, causing the search process to be particularly tedious. Furthermore, exchange students may have additional requirements for their accommodation, such as proximity to their partner university, pricing, and ratings of the listing, which can be challenging to find without a comprehensive source of reliable information.

Secondly, without local area knowledge, it is challenging for Singaporean exchange students to determine which neighbourhoods or areas in the city are well-suited for their needs.

Thus, our app aims to address these pain points by providing a user-friendly platform that streamlines the entire search process for Singaporean exchange students.



1.4 Competitive Analysis

Using Porter's 5 Forces, we analysed the competitive landscape of our app.

Competitive Rivalry	<u>High Competition</u> The student accommodation market is highly competitive, with various platforms such as Airbnb and campus websites offering on-campus and off-campus listings. Despite the competition, our app stands out by providing a single source of consolidated information tailored to the requirements of Singaporean students going on exchange in Vancouver, Canada.
Bargaining Power of Suppliers	<u>High Bargaining Power</u> Suppliers including landlords and property management companies have high bargaining power as they can select which platforms to list their properties on. However, our app provides a larger market reach for these suppliers by aggregating listings from various platforms. This may reduce the bargaining power of suppliers.
Bargaining Power of Buyers	<u>Limited Bargaining Power</u> Singapore students attending Exchange Programmes have limited bargaining power as they are required to search for their own accommodation. Given that our app provides a user-friendly experience and transparent housing options, this could also increase user loyalty.
Threat of Substitution	<u>Low Threat of Substitution</u> There are several substitutes for student accommodation. This includes staying with a host family and subletting. However, as our app provides a comprehensive source of information for both on-campus and off-campus accommodation options, this may reduce the threat of substitution. Moreover, our app also avoids the middleman, thus reducing costs as compared to students renting housing from sublet units.
Threat of New Entrants	<u>Moderate Threat of New Entrants</u> The student accommodation market is highly attractive, with a large potential customer base. As such, there is a moderate threat of new entrants entering the market. Nevertheless, our app positions itself as one focused on the needs of Singaporean students and provides a user-friendly experience, making it more difficult for new entrants to compete.



2. Implementation of NestAbroad

2.1 Development Process

We first set aside vital assumptions regarding the context of our project before collating data from a number of sources regarding housing (UBC Campus Housing options and Airbnbs), hospitals, supermarkets, and public transport options. After which, we would conduct extensive data cleaning and feature engineering in order to create fields that would produce more insightful visualisations before finally implementing the key visualisations on our R Shiny application.

2.1.1 Assumptions

In order to keep the sizes of the dataset and scales of the application manageable, we decided to adopt some assumptions about the sources of accommodation and partner universities. However, it is important to note that despite these assumptions, we have kept our solution extensible.

Assumptions	Implications
Given the scope of our project, we chose to only focus on listings found on Airbnb as it is the most widely used platform that people use to seek accommodation. Additionally, compiling listings from multiple sources might cause additional problems like multiple entries of the same listing.	Using only listings from Airbnb means we would not have a comprehensive set of data for all listings within the Vancouver region.
The University of British Columbia will remain as NUS, NTU and SMU's only partner university in Vancouver in the near future.	This limits the scope of our analysis to one school so that we can generate columns specific to the school (e.g. distance from school). Limiting the scope of our project to a single school also keeps the size of the datasets that we use manageable.
Currency exchange rate is fixed at 0.98 SGD per CAD.	Adopting a static currency exchange rate simplifies the currency conversion part of the project, but will mean that the prices shown are not fully accurate in terms of SGD.



2.2 Data Collection

2.2.1 Data Sources

Following these assumptions, we identified several key data sources for the use of our application.

Data Sources	Details
Inside Airbnb	<p>Detailed listings information which contains specific fields that will be used for analysis and visualisation:</p> <ul style="list-style-type: none">- Listings-related (e.g. availability of listings)- Host-related (e.g. response rate of hosts)- Property related (e.g. location, property type, how many people it accommodates, amenities provided) <p>Compiled set of reviews of the listings Neighbourhoods within the region</p>
University of British Columbia (UBC)'s Student Residences webpages	<p>Through web scraping the official school site, we were able to obtain information of the accommodations provided by the partner-university which includes:</p> <ul style="list-style-type: none">- Location- Price- Available room types- Vacancies of the different student residences
City of Vancouver Open Data	<p>Using reliable government-provided data, we can access datasets containing the precise locations of community centres across Vancouver. This information is valuable for exchange students who are looking for places to visit during their stay.</p>

2.2.2 Limitations of Current Dataset

Limitations	Implications
<p>Detailed listings information can only be found on a quarterly basis when it is uploaded to the data source that we obtained.</p> <p>Due to the lack of resources, we could not obtain an API key that provided dynamic AirBNB listings information for our project</p>	The project is currently limited only to a static dataset.



2.2.3 Web Scraping

Of the data sources identified, the UBC campus housing data had to be scraped through the school's official site. In order to do that, we utilised the **XML** and **curl** packages to scrap the accommodation prices from the UBC Official Website. Due to the difference in the Type of Rooms offered between different accommodations in UBC, we used the **gather()** function in the **tidyverse** package to format the tables and eventually merged the various prices together as 1 dataset named *UBC_Prices_Complied.csv*.

Furthermore, we have also converted the prices provided on the website to SGD and calculated a new column, "**Months**" to add information on the number of months required for the stay in the accommodation.

2.3 Feature Engineering

Upon collecting all of the available data, we performed extensive data cleaning and feature engineering on each of the datasets. This was done on the *data_cleaning.Rmd* file, and the processes are described in detail below.

2.3.1 Data Cleaning

For the main **listings** dataset, we trimmed the dataset by dropping irrelevant columns and filtered listings that only allowed for bookings of fewer than 120 days. Since our application is meant to show listings for students on Exchange Programmes, listings that don't allow them to book for more than 120 days will not be sufficient for their stay. We also noted that AirBnb listings could potentially allow for overcrowding to occur, hence we set an arbitrary threshold of 2 guests per room and deemed that any more than that threshold would constitute overcrowding. Similarly, we filtered out the listings that allow for overcrowding. Finally, basic data cleaning that involved the reformatting of columns into the appropriate data structure was conducted on the dataset (e.g. converting the **price** column from a string to a numeric).

This process was repeated on the complementary datasets with problematic fields. The **reviews** dataset was filtered to only allow for recent reviews, and the **community-centres** dataset contained its latitudinal and longitudinal points within a string, hence we used the **stringr** package to split the string and convert the points into numeric formats so that we can use it in our subsequent visualisations.

2.3.2 Feature Creation

On top of the listings information that we had, we wanted to quantify the distance between listings and their nearest facilities. This included hospitals, supermarkets, train stations, community centres, and the campus. Using the **geosphere** package, we created a helper function to get the distance between two latitudinal and longitudinal points and iterated through the rows of the **listings** dataset to obtain the distance between the listings and their nearest facilities. On top of that, we checked if the nearest hospitals for each listing provided emergency services and included that as a field as well.



Since there was a lot of information on each listing, we decided to aggregate and discretize some of the key metrics to produce ratings which would be considerably easier for a student to compare between listings. We took the ***maximum value observed - minimum value observed***, divided this value by 5, and sorted the columns according to the different bins (or ratings) separated by bins. An example of this is shown below:

The maximum distance to the nearest supermarket for a listing is 2690.57 metres, and the minimum distance is 8.41 metres. Using the formula above, we get a bin size of approximately 536.43 metres. Hence the bins would be as such:

- Distance to nearest supermarket more than 2154.14 metres - Bin 1 (Worst rating)
- Distance to nearest supermarket between 1617.712 and 2154.14 metres - Bin 2
- Distance to nearest supermarket between 1081.28 and 1617.712 metres - Bin 3
- Distance to nearest supermarket between 544.85 and 1081.28 metres - Bin 4
- Distance to nearest supermarket more than 544.85 metres - Bin 5 (Best rating)

2.4 R Shiny Development

Once the data has been cleaned and the new features have been created, we moved on to the development of the R Shiny application. We ensured that the front-end user interface experience was intuitive and created a navigation bar to better aid the student's experiences within the application. This involved creating filters and writing instructions on how to narrow down the searches within the UI elements.

Since the data preparation procedures were done in a separate script and the cleaned data was saved and accessible to the project, we could move on to creating helper functions that aided in the filtering of data according to the different inputs in the UI. We also made some elements within the server such as the radar chart reactive, such that it creates a higher degree of interactivity between the user and the application.

3. Marketing Strategy

As mentioned earlier, our target demographic would be Singaporean students headed to Vancouver for either a study abroad semester or as a full-time international student.

We attempted to create a unique brand identity that conveys our application's values to our users. We did this through the creation of our logo and colour scheme which is constant throughout the application. This would help us stand out from potential competitors in the space.

For the marketing aspect of our application, we wish to emulate the trajectory of an extremely popular student-built application, NUSMods (Chong, n.d.). Created by a group of students as a passion project, they were able to communicate the value of their software to NUS and became an



official supporting application for all students. What this meant for NUSMods was that moving forward, every single year NUS ends up promoting their software to incoming freshman students, resulting in immense reach for their application.

As for NestAbroad, we are also a simple-to-use application that brings valuable resources to students. We can initially approach NUS and see if they are interested in providing the app as an additional resource to students who are headed to Vancouver for their exchange semester. If this method is a success, we can also reach out to other local universities that partner with Vancouver universities such as Nanyang Technological University (NTU).

Another way could be to reach out to student body societies. We could also reach out to university societies that revolve around student welfare such as Bizad Club and their alternatives across other faculties. Each year when semester abroad results are announced these clubs send out a guide and additional resources to the student body. Pairing up with these societies to be added to the circular would further enhance our marketing efforts.

This method would tackle the marketing aspect for students headed for a study abroad semester.

As for students headed to Vancouver as for full-time international students, we can utilise social media presence and advertisements on platforms such as Facebook, Instagram, and LinkedIn to reach out to potential users.

Finally, we can participate in events revolving around studying abroad. There are many fairs annually that promote overseas studying opportunities and the crowds at such events are students planning to study overseas (*Study Abroad Education Fair May 2023*, n.d.). These events occur both internally, such as the NUS Go Global Fair, as well as externally, IDP Study Abroad Education Fair. So setting up booths at such events would increase our reach to a large group of potential students.



4. Navigating NestAbroad

4.1 Bird's Eye View of NestAbroad

NestAbroad features a user-friendly interface with tabs that can be accessed from left to right.

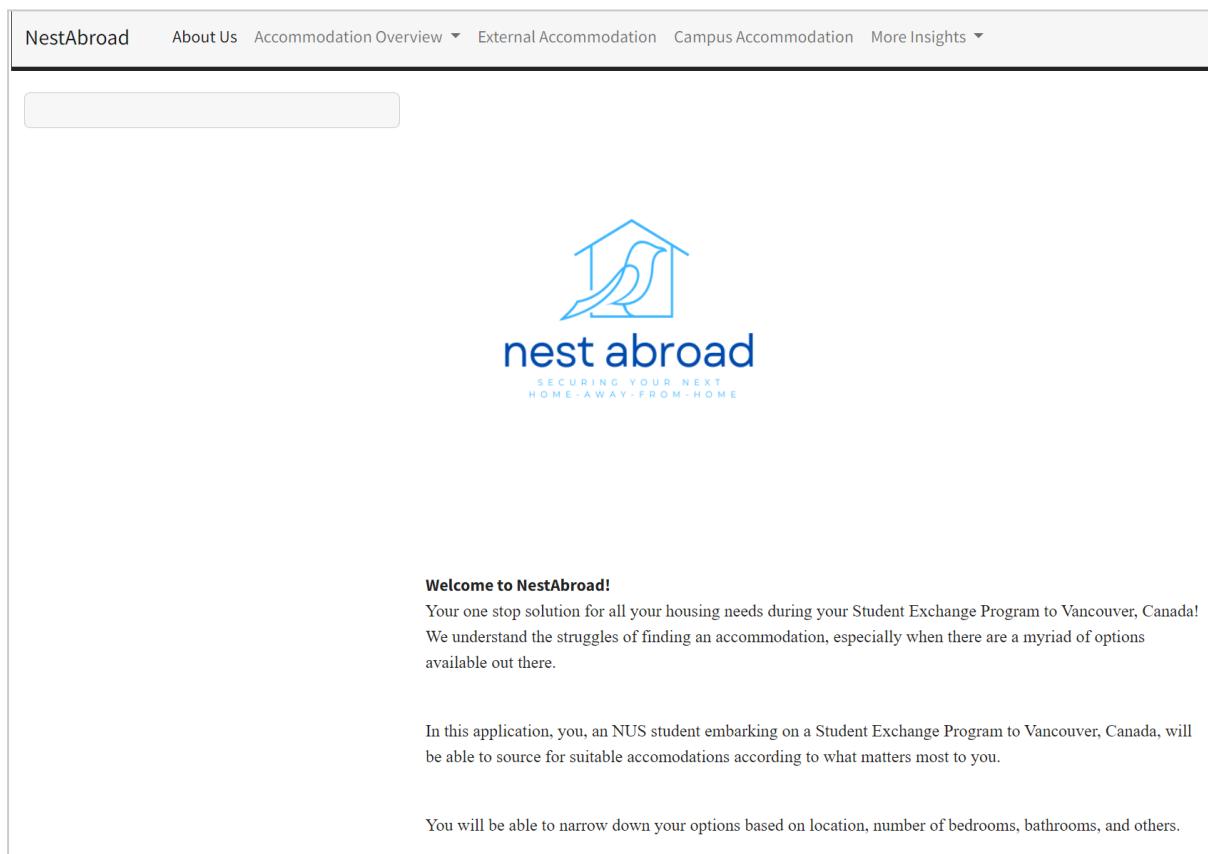


Figure 2 Overview of App Layout

The **Accommodation Overview** tab displays visualisations of spatial data for both on-campus and off-campus housing, while the **External Accommodation** tab provides additional information on listing reviews and nearby facilities. Users can find descriptions of all available student residences in the university under the **Campus Accommodation** tab. The **More Insights** tab offers further data visualisations for both on-campus and off-campus housing, providing users with useful information on Vancouver's housing trends.



4.2 Description of NestAbroad's Features

4.2.1 Accommodation Search/ Filter

Within NestAbroad, users can perform a comprehensive search based on various criteria such as the minimum number of nights required for booking, price range, and property type. Advanced Filters such as proximity to the university and neighbourhood location allow users to further narrow down their search results.

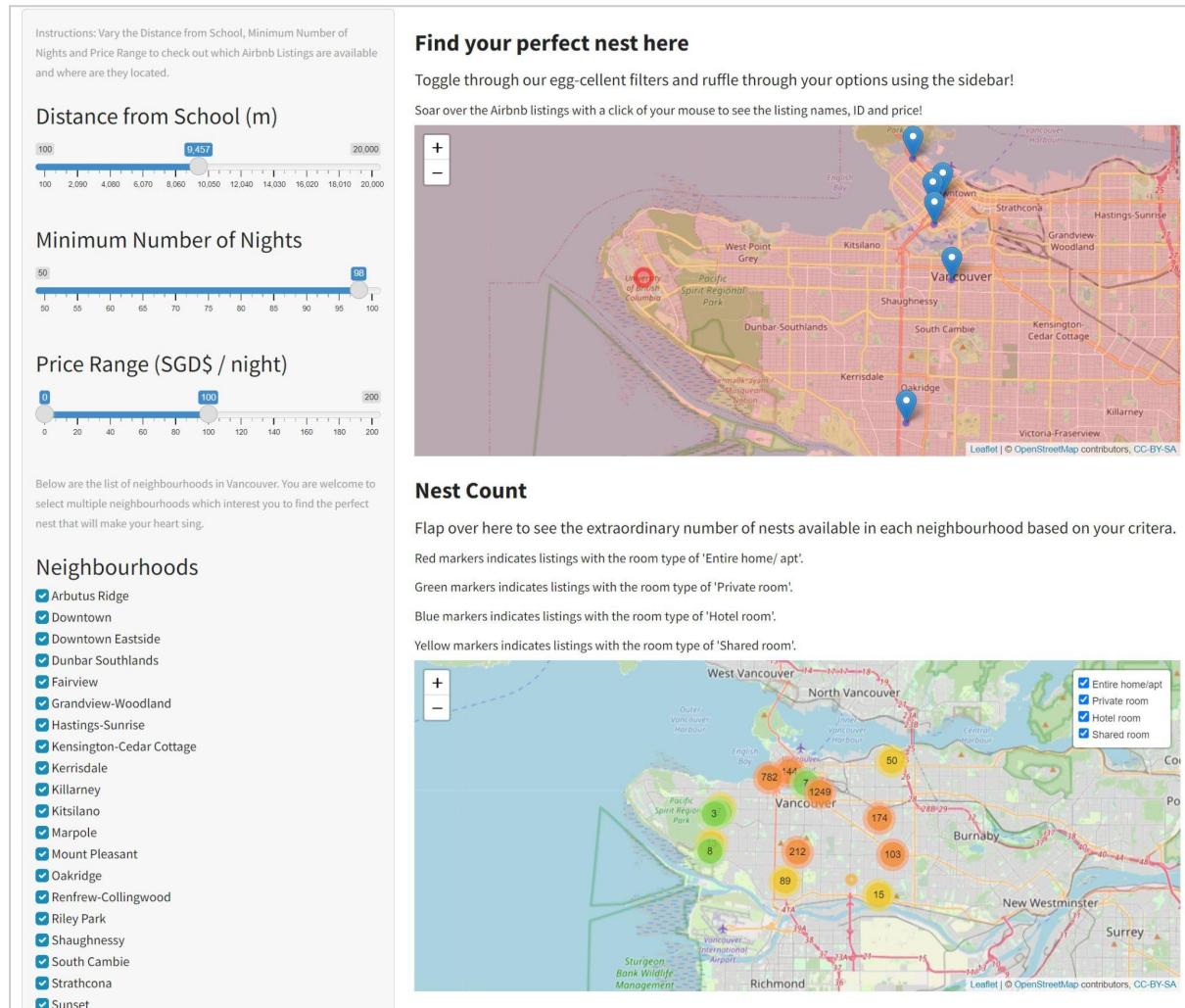


Figure 3 Showcasing available filters under the [Accommodation Overview](#) tab

Other filters, including nearest facilities can be found in the [External Accommodation](#) tab. The [More Insights](#) tab also has filters on listings by Airbnb Superhosts.

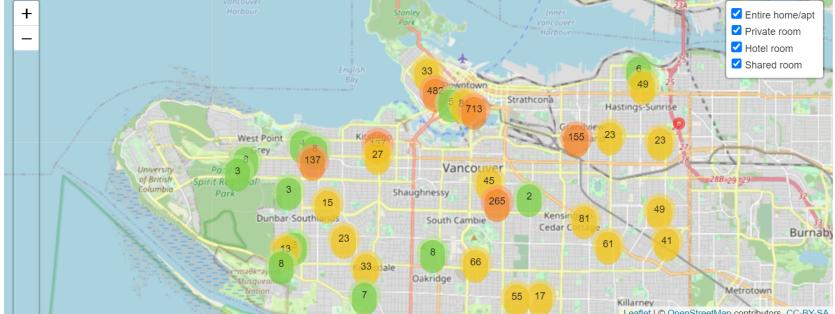


4.2.2 Clear Visualisations

Visualisations play a crucial role in presenting complex information in an easily digestible and engaging manner. They are important as visualisations simplify large datasets and complex information, enabling users to quickly grasp key insights and trends instead of processing raw data from various websites.

This is especially important for students to make well-informed decisions when choosing accommodations and planning their activities during their exchange program, hence simplifying their decision-making process.

Some of the notable visualisations include the following:

Visualisations	Description
Leaflet Scatter Map	<p>Under Accommodation Overview → External, the number of Airbnb listings across the different neighbourhoods in Vancouver is detailed under “Nest Count”.</p>  <p>Users can further filter by Room Type to understand the availability of different rooms in Vancouver.</p> <p>Other Leaflet Scatter Maps can also be found in More Insights → External Accommodation to determine the number of hospitals available in the neighbourhood.</p>
Leaflet Map	<p>Under Accommodation Overview → Campus, users can view where the various student residences are located.</p> 





Dumbbell Plot	<p>Users can visualise the price range for the various campus accommodations at a glance. Each campus accommodation offers different room types, resulting in a wide price range.</p> <table border="1"> <thead> <tr> <th>Accommodation Name</th> <th>Min Price</th> <th>Max Price</th> </tr> </thead> <tbody> <tr><td>Walter Gage</td><td>~900</td><td>~1650</td></tr> <tr><td>Toton Park</td><td>~500</td><td>~1000</td></tr> <tr><td>Thunderbird</td><td>~700</td><td>~1500</td></tr> <tr><td>The Houses of the Ones Belonging to the Saltwater</td><td>~700</td><td>~1500</td></tr> <tr><td>Ritsumeikan-UBC House</td><td>~700</td><td>~1500</td></tr> <tr><td>Ponderosa Commons</td><td>~700</td><td>~1500</td></tr> <tr><td>Place Vanier</td><td>~700</td><td>~1000</td></tr> <tr><td>Orchard Commons</td><td>~700</td><td>~1000</td></tr> <tr><td>Marine Drive</td><td>~700</td><td>~1250</td></tr> <tr><td>Iona House</td><td>~700</td><td>~1350</td></tr> <tr><td>Fraser Hall</td><td>~700</td><td>~1500</td></tr> <tr><td>Fairview Crescent</td><td>~700</td><td>~1500</td></tr> <tr><td>Exchange</td><td>~700</td><td>~1500</td></tr> <tr><td>Brock Commons-Tatwood House</td><td>~700</td><td>~1000</td></tr> </tbody> </table>	Accommodation Name	Min Price	Max Price	Walter Gage	~900	~1650	Toton Park	~500	~1000	Thunderbird	~700	~1500	The Houses of the Ones Belonging to the Saltwater	~700	~1500	Ritsumeikan-UBC House	~700	~1500	Ponderosa Commons	~700	~1500	Place Vanier	~700	~1000	Orchard Commons	~700	~1000	Marine Drive	~700	~1250	Iona House	~700	~1350	Fraser Hall	~700	~1500	Fairview Crescent	~700	~1500	Exchange	~700	~1500	Brock Commons-Tatwood House	~700	~1000
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Radar chart	<p>Students often need to weigh different factors when choosing accommodations, such as the host response rate, the safety of the listing, amenities provided, and convenience to the school as well as to other facilities.</p>																																													



5. Feasibility

5.1 Market Feasibility

5.1.1 Increase in Singapore's Demand for Overseas Exposure

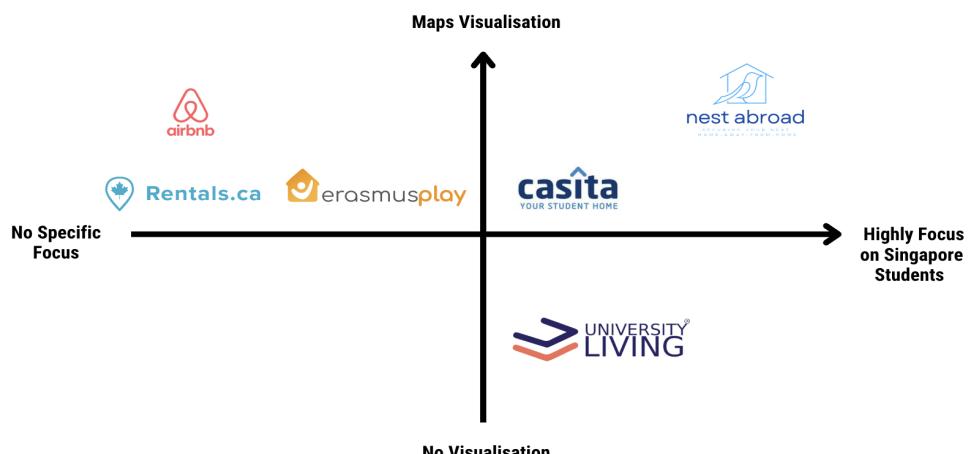
According to the most recent data from the Open Doors Report (2021), more than 20,000 Singaporean students studied abroad, with Canada ranking among the top countries. Since the Covid-19 pandemic-related travel restrictions have been loosened, there has been an increase in demand for international education in Singapore. Local institutions including NUS, NTU, and SMU have started sending students to their international partner universities for academic immersion programs, work-study entrepreneur placements, and exchange programs. Among them, UBC in Vancouver is one of the popular choices because of its cultural diversity and excellent academic programs covering a variety of majors, such as business, engineering, social sciences, health sciences, and more.

This growing trend creates a sizable opportunity for NestAbroad because we want to offer a platform that caters to the particular requirements of Singaporean students who desire to study in Vancouver. We believe that our app can assist Singaporean students in achieving their academic and personal objectives while studying overseas by providing a wide variety of tools and advice. Overall, the desire for international education in Singapore is rising, which is a trend that we aim to capitalize on with our improvement in the long term..

5.1.2 First Mover Advantage

Although there are many websites to look for accommodations, NestAbroad is the first one strongly focusing on Singaporean Students who want to study abroad. Based on our competitor analysis, NestAbroad differentiates ourselves through personalised features and friendly map visualisations. With the target of being a guidebook for them on finding accommodation journey, we aim to make the customer's choice easier. For that reason, we are able to establish strong brand recognition and service loyalty before other competitors.

COMPETITOR ANALYSIS



For the high focus on exchange students, we include specific search tools based on the customer's journey and behaviour. We notice that the students will choose their accommodation based on some factors such as prices, distances to school, locations of nearest Hospitals, Community Centres and Supermarkets. Therefore, we add these factors to search engines so that customers can easily find the places that satisfy their demands.

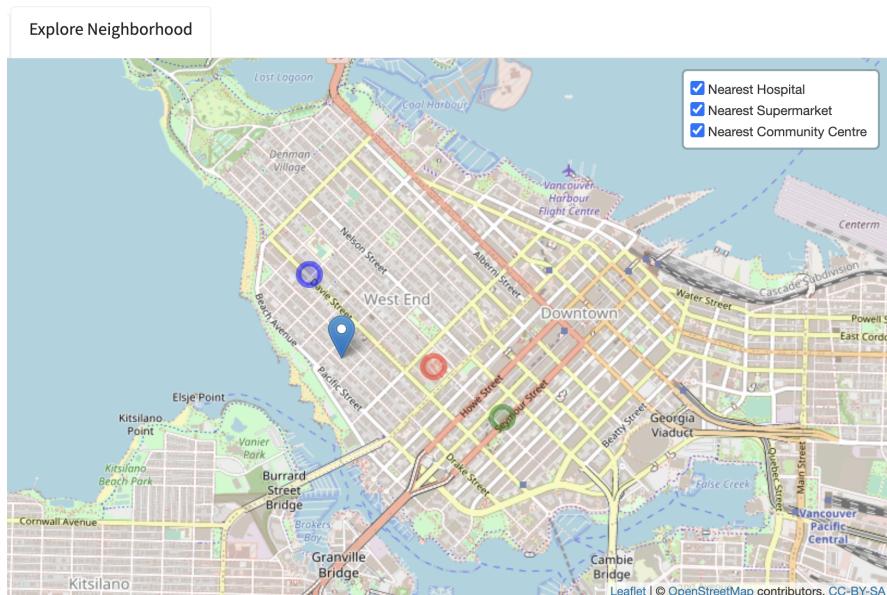


Figure 4 Showcasing available filters under the **External Accommodation** tab

Moreover, as we narrow down our target customer to students (from 18 - 25 years old), we have a strong focus on how they interact with web applications and try to make it as convenient as possible. Each page's design is very simple and the contents are most relevant to our customers. We also have guide notes in each tab to ensure that customers can easily interact with our data and get the information they want. Additionally, charts such as Bar Charts, Word Clouds, and Radar Charts are used effectively to aid in simulating information in a vivid and comprehensible way.



Figure 5: Wordcloud showcasing the comments for the Listing

Figure 6: Radar chart based on the rating for the Listing



5.2 Operational Feasibility

At this moment, according to our analysis of the operational viability of the app, our web app can be launched and used for Singapore students who want to go to Vancouver for exchange. Our team has identified crucial operational needs in areas like marketing, web maintenance and customer service, and we have put plans in place to satisfy these needs. To make sure that our app is well-positioned to flourish in the market, we have also carried out in-depth market research and examined the competitive landscape.

Besides, technical disruption is our main concern. To minimise this issue, there are a few tactics that can be used such as load testing, regular maintenance and continuous monitor. Therefore, we can reduce the likelihood of technical interruptions and guarantee that NestAbroad web is stable and dependable for users.

6. Future Outlook

6.1 Updated daily AirBnb data

To provide the latest and most accurate information to customers, we will try to search for new data sources that can help automatically update the status of booking and the availability of rooms. This feature will help us cut down on time and human resources that are used to manually seek and adjust information.

6.2 Extend the market

As this is a commonly seen issue that doesn't occur to just students going to Vancouver, our group plans to expand our idea to students travelling to other countries as well. Research from the European University Foundation and Erasmus Student Network found that "finding suitable and affordable accommodation abroad" were one of the most common challenges faced by students going on exchange (Bichard, 2018).

Our expansion plan will start from Canada to North America area and gradually go globally. Our team also keep researching on the exchange programs in universities and college in Singapore to adjust the expansion plan so as to promptly respond to Singapore students' needs.

6.3 Build up more features

In the future, our app could also be designed as a one-stop solution for students' entire exchange journey. Some new features such as flight booking, recommend food & drink places and tourist attractions guidelines are under research and development. Overall, we aim to bring an insightful and enjoyable experience to students.



7. Conclusion

7.1 Tackling the Identified Pain Points

It is fair to say that NestAbroad offers students a seamless and stress-free way to find suitable accommodation in Vancouver. This is because the application tackles both the pain points that students were initially facing.

First of all, the lack of consolidated information is tackled as the application is able to draw information from a number of different datasets. Providing the user with a more holistic view of the housing market without having to operate multiple applications or websites.

The second pain point related to not knowing which neighbourhood was best situated to their needs. To tackle this issue not only does NestAbroad provide listing information of accommodations, but it currently also provides insights about facilities such as supermarkets and hospitals in the vicinity. Additionally, as we roll out updates and include more features on the application, the user would end up getting an even better idea of the neighbourhoods the listings are situated in.

7.2 Differentiating from Competitors and Future Plans

That being said, while we are aware that there are already well established competitors in the market, we believe we can sufficiently communicate our differentiation from the rest to the ever growing student body that seeks to gain exposure overseas. While we already stand apart by targeting our for 18-25 year olds and by providing unique features such as Word Clouds, we intend to further strengthen this differentiation through implementing flight and food recommendations as well. Furthermore, our future plans do not end there, we also intend to expand our horizons and initially try to cover the entire North America region in our application.

All in all, our all-in-one app simplifies the search process, allowing students to quickly locate listings that match their selection criteria. As we continue to expand our platform and add more countries and regions, we aspire to become the go-to platform for Singaporean students embarking on SEP across the globe. With NestAbroad, students can take flight with confidence, knowing they have a reliable and convenient solution for their accommodation needs.



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