



HDB Resale Flats

DBA3702

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Group Project

SA1 Team 5

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1. Pain Points and Target Market

The uncertainty of the global economy due to Covid-19 has caused housing prices to fluctuate in recent years. Global supply chain disruptions have also caused bottlenecks in the construction industry. Many BTO projects are facing delays of up to one year or more, as the construction industry continues to grapple with a manpower shortage caused by tighter border controls (Ng, 2021). Homes are selling faster in 2021 than in any other time in recent history, potentially making it an excellent market to sell. But with record-low inventory, it's an extremely competitive market to turn around and buy your home.

With long waiting lists of Build-to-Order (BTO) flats between four and five years, many young couples have thus switched to looking for resale flats, leading to rising demand for resale flats (Lai, 2021). Our key target market would be this new group of young couples who are not as familiar with the property market and are entering the resale market for the very first time. Not only are they more price sensitive due to their low wealth accumulation given their young age, they also tend to have a greater emphasis on amenities nearby such as schools, especially for those who intend to start a family. Thus, they place pricing factors and amenities availability into huge consideration when deciding on their flat purchases.

Being new to the resale market, they are unsure of which kind of resale flats to buy that would give them the best value and are worth for money. Existing platforms such as PropertyGuru and 99.co provide a very comprehensive listing of flats available and also allow buyers to filter through flats. However, they do not enable buyers to rank their preferences and compare across flats easily. Buyers also often have to browse through multiple sites which can make it even more confusing for them, having to compare flats across sites. In addition, buyers usually end up having to seek the help of agents to connect them with sellers as well as to guide them to make a decision on which flat to purchase. This is expensive and time consuming for them, thus making the purchase of flats a hassle and bringing inconvenience to them.

Therefore, we have built an application that would enable buyers to pick a resale flat that is the most fitting to their preferences through data analysis and visualisations as well as interpretations to make it easier for them to make price and amenities comparisons between flat locations. In the long run, we can also extend the use of our application to sellers who want to find out more about price trends of the type of flat they wish to sell so they can sell it at a price that would profit them as well as using the application to connect with interested buyers.

2. Our Proposed Solution

Our solution to addressing the issues of inefficiency of sourcing of flats for flat buyers would be a simplified application called Propertal to provide useful insights and information about properties and their price trends.

Beyond just showing past prices of resale flats based on various factors such as flat type and flat area, we have gone one step further to allow flat buyers to indicate their preferences by ranking the level of importance they place for each kind of amenity. Our application would enable them to compare between two flats by analysing the various kinds of amenities nearby the flat and with that of their personal preferences.

Our overall objective is to provide users a customised experience that would enable them to pick the flat that suits them the most at a reasonable price. Our application serves a complementary role to existing property websites for flat buyers to make an easier comparison of resale flats after shortlisting their favourites flats from those websites.

2.1 Our Product

The homepage of our application consists of three main sections: Resale Analysis, Location Analysis and Recent Summary (Figure 1).

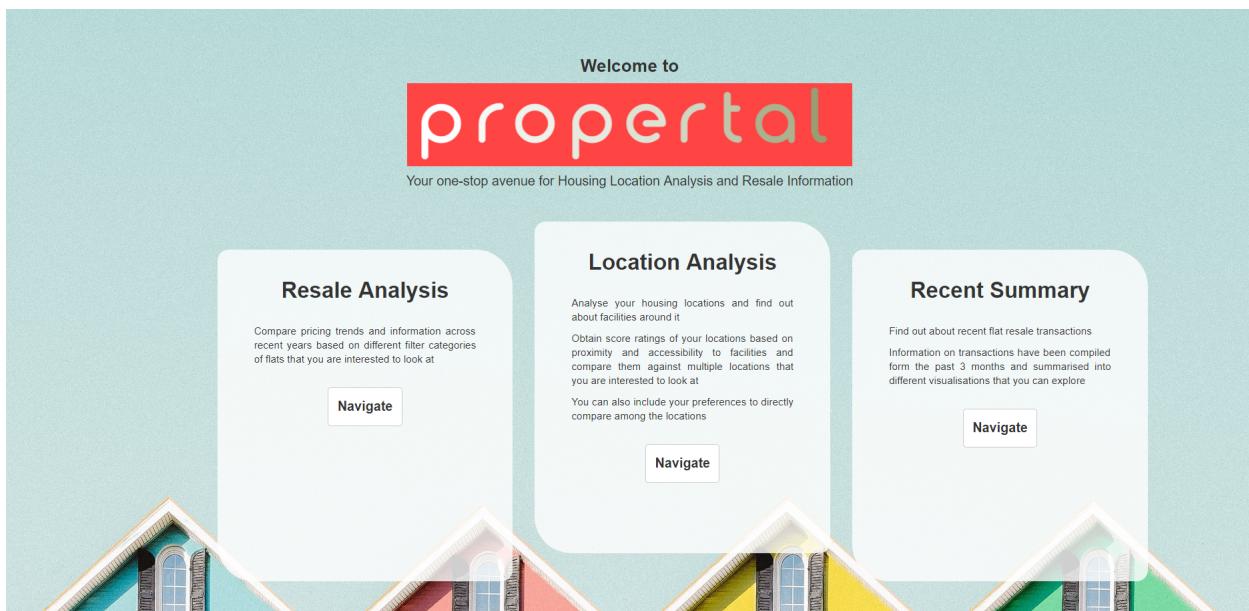


Figure 1: Homepage of our application

2.1.1 Resale Analysis

In this section, we feature the pricing trends of resale flats using available resale flat data over the past few years and then comparing them with CPI adjusted prices.

Before going to property websites to browse through resale flats, flat buyers would first use our application to gain an overview of the price trends in the resale flat market. They will be prompted to filter and select the town, flat type, flat model, floor area and flat level and remaining lease years, depending on their preferences (Figure 2). After which, our application will present them with a line graph to show the recent price trends of these types of flats based on resale data available (Figure 3). They will then be able to shortlist a few kinds of flats based on their budget given these price trends, then use these as filtering conditions when browsing through property websites.

The 'Filter' interface includes the following controls:

- Town:** All (dropdown)
- Flat Type:** All (dropdown)
- Flat Model:** All (dropdown)
- Floor Area (sqm):** Range from 31 to 249, with counts of 31 and 249 at the ends.
- Storey Range:** Range from 1 to 51, with counts of 1 and 51 at the ends.
- Remaining lease (years):** Range from 43 to 97, with counts of 43 and 97 at the ends.
- Confirm Filter** button

Figure 2: Interface where customers can select and filter the flat types and factors based on their preferences

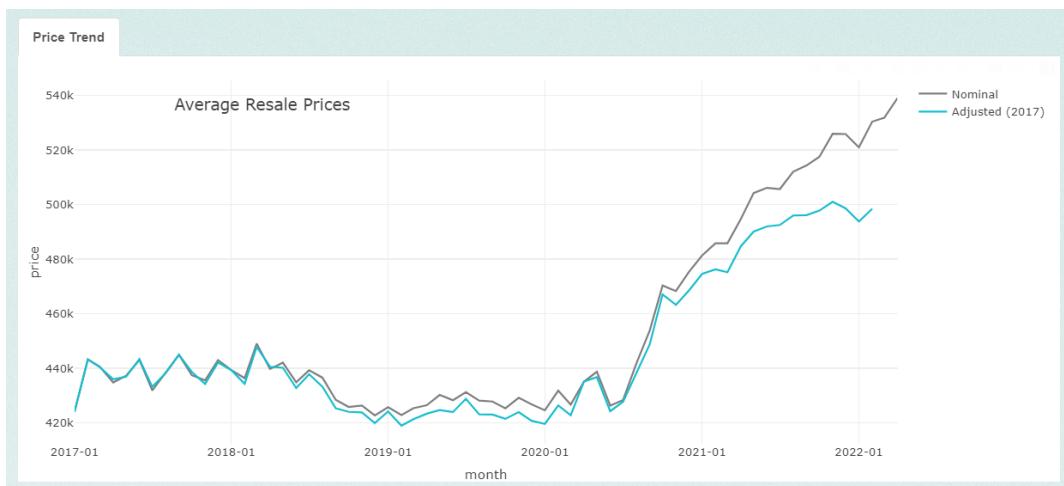


Figure 3: Line graph showing the price trends over the years based on resale data from selected factors of the resale flat

One additional feature that we provide buyers is giving them basic interpretations of the inflation trends and valuation changes as observed through the line graphs based on the most recent 4 months resale flat data available (Figure 4). This allows users to understand the price trends better and help them make a more informed decision in whether to buy the flat now or later into the future. This is especially user friendly for buyers who are new to the property industry and unfamiliar with the industry trends.

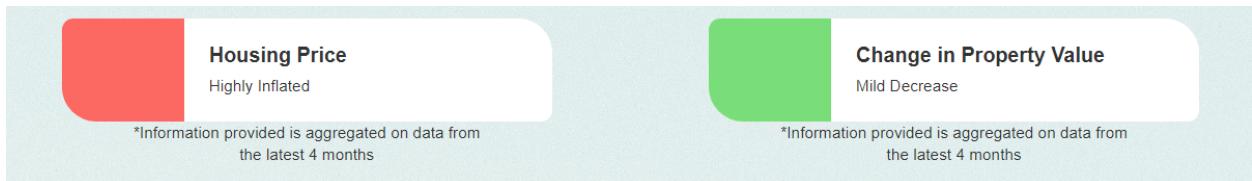


Figure 4: Inflation trend and valuation change interpretation

2.1.2 Recent Summary

Our application also provides a “Recent Summary” page for users to keep up to date with the happenings of the resale property market (Figure 5). This page highlights recent events, such as the total number of flats sold in the most recent 3 months. It also provides a summary of the flat sold by type and model in recent months.

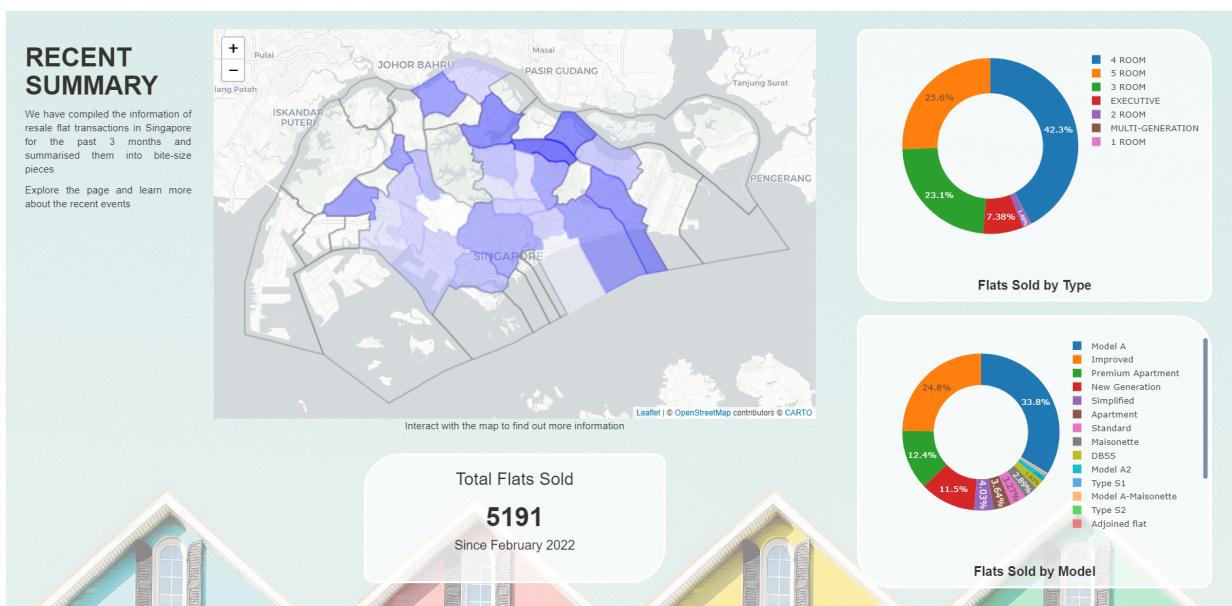


Figure 5: Recent summary page

In particular, there is an interactive map where users can explore to find out the number of resale flats transacted in a particular location as well as the average, maximum and minimum flat resale prices in the area (Figure 6).

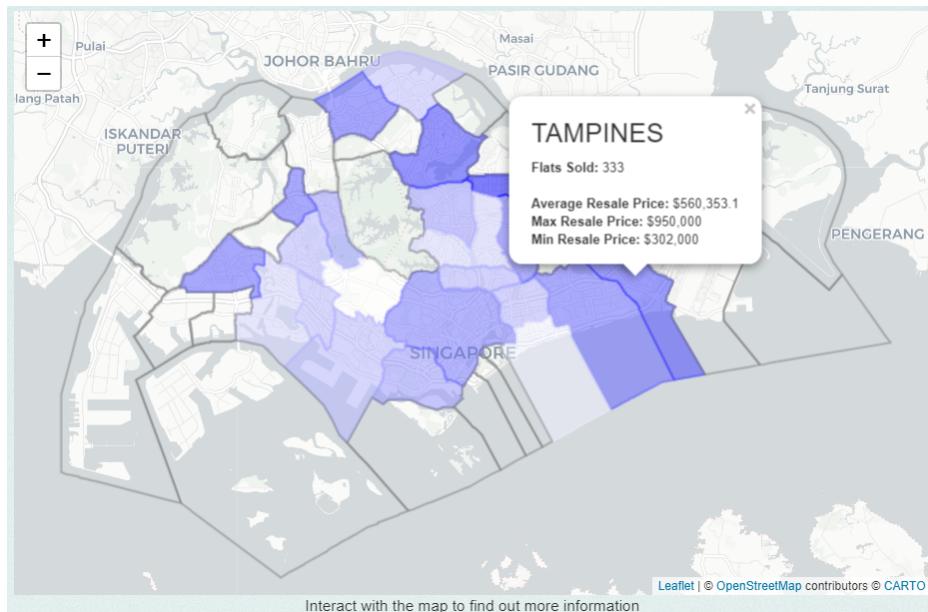


Figure 6: Interactive map

2.1.3 Location Analysis

The application will also feature a section that allows buyers to view and compare the different amenities nearby their shortlisted flats simply by keying their addresses in the application. Buyers are allowed to compare up to 2 locations (Figure 7). In addition, they are also given the option to indicate their desired personal preference score ratings of the amenities taken into consideration and valued by them with respect to the location (Figure 8). We have decided on the various main amenities that we believe that young couples would be interested to look at when deciding on the location of the resale flats. These factors include transportation, healthcare, dining, groceries, parks and schools especially for couples who wish to have children in the coming years.

Compare Preference

Enter the housing location addresses that you would like to take a closer look at and analyse.

Compare up to 2 locations at once.

Address 1

Woodlands

Address 2

Yishun

Compare

Figure 7: Section where users can key in the addresses of flats they have shortlisted

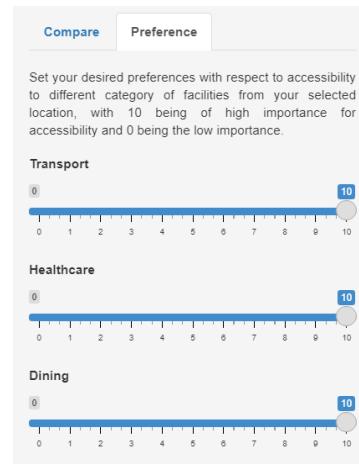


Figure 8: Section where users can indicate their preferred score ratings in terms of how much they value the proximity of those amenities

The accessibility of the flat to these amenities are calculated, depending on the distance of the flat to an amenity where a score will be generated based on the proximity from the flat location to the amenities.

Such information will be presented in the form of a radar chart where the amenities are displayed in a circle as various scoring factors. Each factor is scored based on the distance of the flat to such an amenity, graded based on percentile (Refer to Appendix). Factors with higher scores will have points further away from the centre of the radar chart and vice versa. Users can directly compare on the chart how closely mapped the radar charts of 2 flat locations are to figure out which flat is more aligned with their needs and interests (Figure 9). This will help buyers to filter and make a better decision when comparing between locations and decide on the best place to purchase a resale flat that is catered to their amenities and pricing needs.

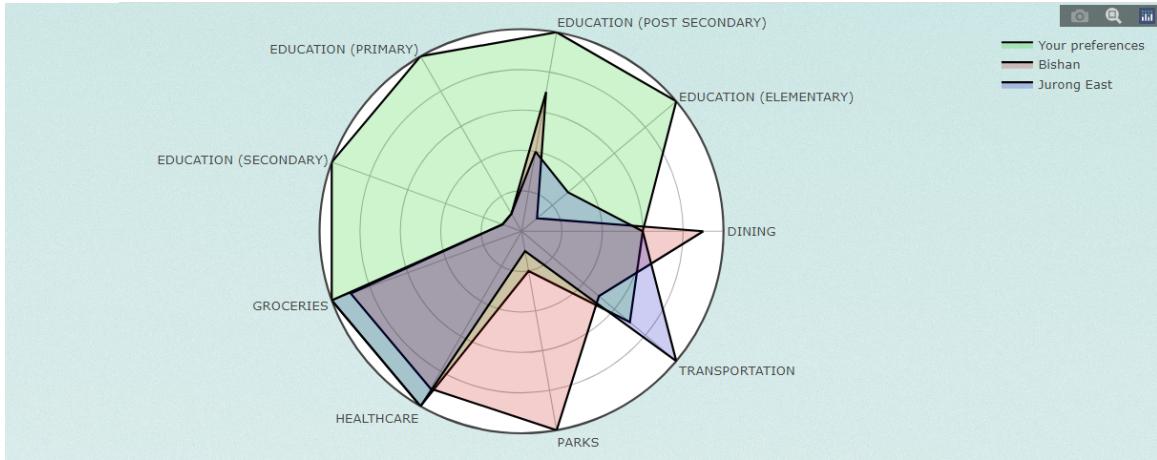


Figure 9: Radar chart that compares across 2 resale flat locations & user's ideal score preferences

There is also an additional map feature for buyers to view the available amenities nearby the selected location, with different icons representing the different types of amenities, and different colours that represent the amenities near the respective flat location selected by buyers. This increases the visibility of the amenities from the location to buyers and provides concrete insights about the locations (Figure 10).

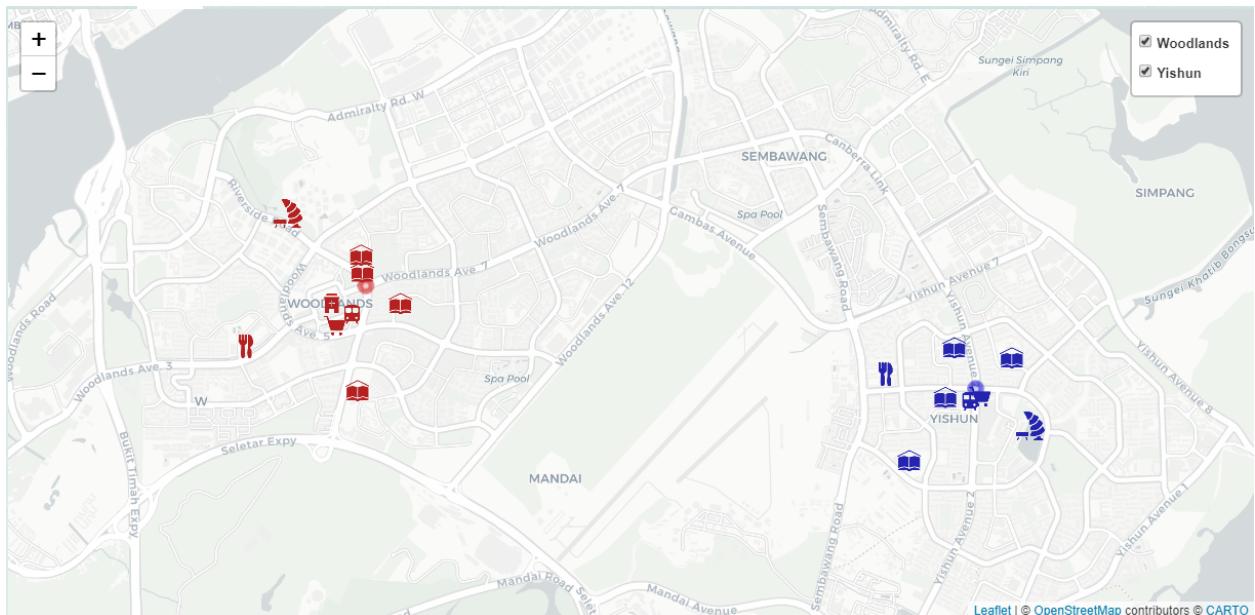


Figure 10: Map that enables flat buyers to visualise the amenities nearby the flat

To make their final decision on which flat to pick, flat buyers can then view the overall scores for each flat under the “Summary” tab and compare accordingly (Figure 11). In addition to the overall score, a preference fit score is also shown for each flat so that they would know how fitting each flat is in accordance to the preferences that they have indicated. Should they decide

to look into other flats apart from these two flats, they can also still make a relevant comparison by taking note of the overall score and preference fit score given in this tab.

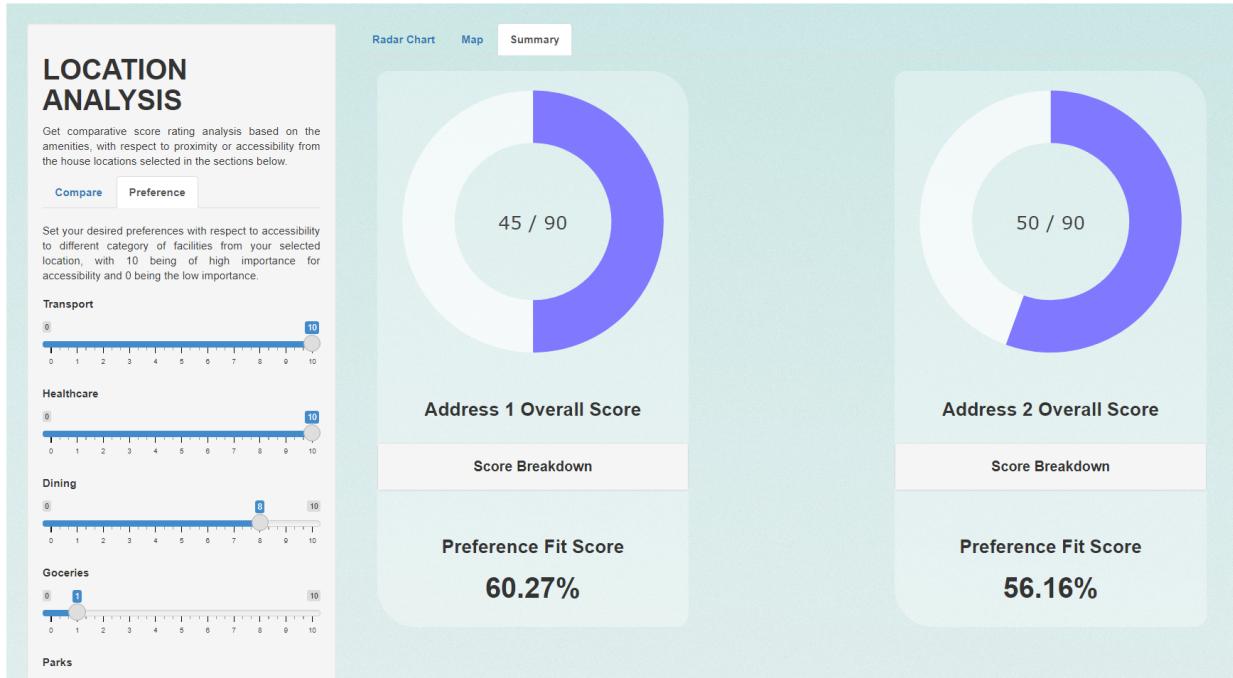


Figure 11: Scores given to each flat

2.2 Our Value Proposition

Through this application, we aim to improve the experience of flat buyers by playing a complementary role to plug the gaps of existing property websites. This would be the expected user experience (Figure 12):

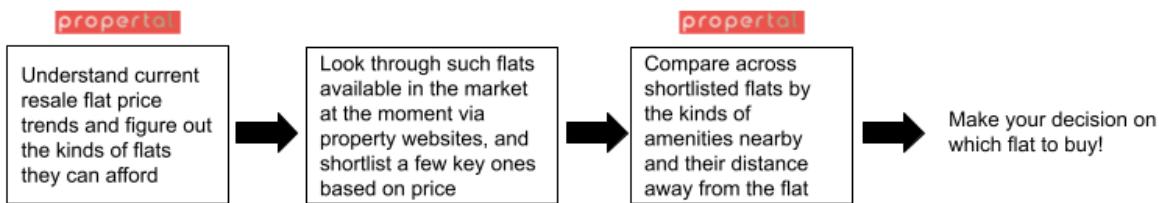


Figure 12: User journey of flat buyer

One differentiating factor of the application is allowing buyers to observe price trends based on the selected types of flats filtered out by the application, allowing buyers to have a sense of how the prices are changing over the years, which aids in their decision of whether they should purchase it now or later. They would also be able to understand the kinds of flats that they can afford given their budget. Moreover, we have even adjusted the prices for inflation which gives a more accurate representation of the real prices of the property flats. With interpretations provided, our application makes flat-buying even easier for first-time buyers.

Another differentiating factor that makes the application stand out from other property websites is the ability to generate scores for the location selected by the buyer based on the accessibility of the amenities that are situated nearby the location. In addition, our application also provides a customised experience by incorporating the type of amenities valued by the flat buyer into this score rating. This allows flat buyers to easily differentiate and make a judgement of how aligned the selected or desired location is with their ideal preferences based on accessing the proximity of the valued amenities with the location selected.

Overall, our application is user friendly and would be able to provide help and step-by-step guidance for buyers seeking to buy a resale flat even if they have minimal knowledge about property flats. The customisation offered in our application where buyers are able to filter out their desired flat types and decide on their preferences based on a variety of amenities considerations, further adds value to customers as it caters to their needs.

3. Implementation Plan

Our implementation plan is as follows:

Timeline	Action	Objective
Now - Jul '22	Carry out pilot testing for our minimal viable product (MVP) in the form of a web application. Gather flat buyers' feedback and make modifications to our application accordingly.	Improve our product in the shortest amount of time to make it ready for the market
Jul - Dec '22	Roll out new features and updated versions of the product on a stage-by-stage basis. Form partnerships with property agencies and property agents. Carry out online promotions and marketing through influencers and search engine advertisements (SEA). Start monetisation by charging users of our application.	Release a market-ready product and increase flat buyers' awareness of our product in order to start generating revenue
Q1 2023	Release Apple App Store version of our application. Continue to carry out online promotions and marketing through influencers and search engine advertisements (SEA).	Further expand our customer base
Q2 2023	Release Google Play Store version of our	Further expand our

	<p>application.</p> <p>Explore additional new features, such as customised property search.</p> <p>Continue to carry out online promotions and marketing through influencers and search engine advertisements (SEA).</p>	customer base
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Given the initial stages of our product building, we intend to focus more on our product and users' needs first in the upcoming months to build a market-ready and value-adding product. After which, we will then divert our efforts more into marketing and customer acquisition for the second half of the year. Subsequently, we will generate new versions of our applications in order to cater to more customers.

3.1 Monetisation Model

Based on our analysis, flat buyers would likely be willing to pay for our product if it is helpful to them because they are already going to spend a tremendous amount of money on their resale flat. Therefore, an additional small sum of money to make the process easier would not seem like a significant loss in comparison. We intend to partner with property agencies and property agents who would be able to promote our application to these flat buyers. We would then charge flat buyers a small one-time fee of \$50 for an access of 6 months to our platform to assist them throughout their flat buying process. To ease flat buyers into using our product, we would also allow for a free trial usage but limited to only 1 day.

3.2 Marketing Strategy

We intend to run multiple online promotions to reach out to our target market, given the digital savviness of our target market's age group as young couples.

Firstly, we intend to carry out influencer marketing to reach out directly to this group of audience in a relatable manner. A key influencer that comes to mind would be The Woke Salaryman, which is an extremely popular financial literacy content creator for Singaporean millennials. The Woke Salaryman's past works have proven that they can share sponsored messages in a relatable and engaging manner. Therefore, we believe that using The Woke Salaryman as a platform to reach out to our target market would be an extremely crucial first strategic move to establish us as a platform specifically for young resale flat buyers to simplify their home buying process.

Secondly, we intend to invest in search engine advertisement (SEA), since most of our target customers would likely search for information on the Internet when they want to buy a property. We would be targeting specific search terms such as "resale flat", "things to consider when buying a property", "property agents" and "property prices" to ensure that our search engine advertisements pops up at the right time when flat buyers are first starting to browse for a flat.

3.3 Future Plans

In the long run, we hope to include even more features into our platform to make it an all-in-one platform. Our platform currently plays a complementary role to existing property websites. However, this is particularly risky because these property websites can replicate our application features rather easily. Therefore, we intend to take the first move and replicate their features, such that we can consolidate all features needed for a young couple to make their resale flat purchase. A key idea that we have in mind would be a customised property search function, where we take our customised flats comparison (for amenities) function even further. With key preferences and budget indicated by the user, our platform would then recommend the top flats that they can shortlist.

Eventually, we also hope to earn a larger chunk of our revenue from property transactions. Buyers can use our customised property search, and the sellers can list their property for free. This means that a basic property transaction is completely free. Since buyers have to state their willingness to pay and their preferences when they search for properties, we can show them their dream property and set the price for a property individually a little bit below their maximum willingness to pay (first-degree price discrimination). Buyers are encouraged to state their true willingness to pay because otherwise, they will not be matched to their dream property, and another buyer with a higher willingness to pay will be matched to it. Thus, sellers earn the highest profit possible in a certain time frame. We will then charge up to 5% of the transaction price for the sellers for this service that we provide.

Nevertheless, given that the property platform market is already quite saturated, if there comes an opportunity for us to exit earlier by being acquired by an existing property website, we would likely accept the offer.

4. Conclusion

Given the difficulties faced by young couples in picking a resale flat to purchase, our application focuses on providing a good overview of property price trends and customised property comparison across flat locations. In the initial stages of our application, we will be getting customer feedback and aiming to build trust and relatability with our target group.

Eventually, we hope to include customised property search and enable the listing of properties into our application as well. With this approach, we expect to steal more customers from our competitors such as 99.co, SRX, and Property Guru. Our competitive advantage will then consist of the network effect and a significant amount of data that we will be able to collect to enhance our features further and better predict the maximum selling price.

5. Appendix

5.1 Scoring System for Preferences

In order to give a representative score rating for each category of amenities, we took a sample of 400 housing locations and calculated the distance between them and their respective nearest amenities. From there, we look at the distribution of the distances across each category and break it down into segments based on the percentile of 0th to 10th, 10th to 20th and so on until the 100th percentile. The ranges of these segments are then used to determine the score rating for each category with the 0th to 10th percentile range having the highest score. In this manner, our scores provided would be simplified and give an actual representation based on the housing standards across Singapore.

5.2 Data Source

For our application, we are scraping data off the data.gov.sg website using their API and obtaining the data of flat resale transactions in Singapore since January of 2017, as well as the resale price index in Singapore.

Links to website:

<https://data.gov.sg/dataset/resale-flat-prices>

<https://data.gov.sg/dataset/hdb-resale-price-index>

6. References

Ng, M. (2021, July 7). *BTO flat buyers affected by covid-19 construction delays may be able to cancel booking without penalties*. The Straits Times. Retrieved April 14, 2022, from <https://www.straitstimes.com/singapore/housing/bto-buyers-affected-by-delays-may-be-able-to-cancel-flat-booking-without-penalties>

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