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ITBW21 VISUAL ANALYTICS PROJECT

# Final Report

AY2022 Semester 2

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| --- | --- |
| **Module Group:** | ITBW21-01 |
| **Project Team Number** | 4 |
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| **Due Date:** | 19/02/23 |
| **Class:** | BA2201 |
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| **The Latest Report Amendment Date:** | 19/02/23 |

## Table of Contents

Executive Summary ………………...…........................................................................................... 3

Project Plan ………………............................................................................................................. 7

Data Understanding, Visualisation, and Modelling ….............................................................. 8

Problems Encountered ......................................................................................................... 25 Future enhancements ........................................................................................................... 26

Conclusion ............................................................................................................................. 27

## Executive Summary

* Summary of business objectives & hypothesis, and user requirements gathered.

The business objective is to make Singapore a better place to live in by focusing on the factors of race, education, and finances. Our hypothesis is that Singapore is indeed a good place to stay/work in.

User requirements gathered:

|  |  |  |
| --- | --- | --- |
| **S/N** | **Use Case** | **User Story** |
| 1 | Affordable living cost | As a Singaporean, I want to be able to live day to day without being overly money conscious so that I do not have to be burdened by cost. |
| 2 | Purchase limitations | As a Singaporean, I want to be able to afford purchasing necessities without being limited to affordability so that I could enjoy by prioritizing other factors such as taste and convenience more frequently. |
| 3 | Affordability in partaking in leisure activities | As a Singaporean, I want to be able to afford partaking in leisure activities so that I can relax after a long week. |
| 4 | Financial burden in partaking in leisure activities | As a Singaporean, I want to enjoy leisure activities and not be burdened by the cost so that I can improve my performance in studies or work. |
| 5 | Importance of entertainment and relaxing | As a Singaporean, I want to be able to afford relax and have fun so that I can take a break occasionally. |
| 6 | Equality and meritocracy in Singapore | As a Singaporean, I want to live where everyone has an equal chance to succeed and achieve their goals so that I can be judged based on my merits and abilities. |
| 7 | Community Awareness in Society | As a Singaporean, I want to know if my society is aware of racism so that I can be less tolerant to it. |
| 8 | Promoting unity in Singapore | As a Singaporean, I want to live in a community where everyone can thrive without racial discrimination so that I can feel safe and welcome in my own home country. |
| 9 | Building Inclusive community | As a Singaporean, I want to do initiatives so that I can build a more inclusive community for everyone. |
| 10 | Enrolment statistics | As a Singaporean student, I want to know the enrolment statistics of local schools and enrolment of outbound Singaporean students to make a more informed decision of where to complete my studies. |
| 11 | Benefits of Singapore’s education system on employment | As a student studying in Singapore, I want to know if Singapore’s education will give me an advantage for employment, so I can have a feasible scope when job hunting. |

* Describe the business scenarios, recommendation and insights discovered.

Our team aims to assess the suitability of Singapore as a place to live by identifying the factors that impact the quality of living in Singapore. By conducting a survey and gathering datasets based on the responses, we then identify the 3 main areas of concern which are: Cost of living, socio-cultural environment, and education. Next, we gathered and cleaned data from various sources to target our data towards our audience (Gen Z). Next, we would add visualisation charts and statistical modelling techniques to offer insights into the quality of life in Singapore. Overall, we find that Singapore ranks highly in these areas, with a high standard of living and strong government support for social programs.

Recommendations as follows:

* **Cost of living (By: Valerian)**
  + The recommendation for this is to address the underlying causes of the issue to avert the negative effects on Singapore's economy caused by the high cost of living. Implementing measures to lower inflation, boost earnings, and offer affordable housing options could be part of this.
* **Socio-cultural Environment (By: Irsyad)**
  + One recommendation to further promote equal opportunities for all races in Singapore could be to increase the government's support for households in lower income brackets. This could involve expanding existing schemes such as Comcare or introducing new initiatives to provide greater financial assistance to those in need.
* **Education (By: Ying Qi)**
  + One recommendation to further enhance the standards of Singapore’s education system is to allow more integrated studies, more hands-on learning to equip students with more soft skills that can better prepare students for the workforce.

Insights discovered:

* **Cost of living (By: Valerian)**
  + Generation Z is pressured to keep up with the economy where inflation and cost of living are constantly increasing as well as aiming to secure jobs. However, since the cost of living is too high, people tend to retire way beyond the expected retirement age in Singapore. This cause Generation Z to take up in part time jobs to support their finances and plan ahead for their future at such early ages. The cost of living will only continue to do harm to Singapore's economy as there will be less people given the decreasing birth rates and the rate will continue to decrease until it is below the mortality rate if living in Singapore becomes too expensive.
* **Socio-cultural Environment (By: Irsyad)**
  + Investment in education, particularly in universities and secondary schools, indicates the Singapore government's focus on building a highly skilled workforce for the future to drive innovation, research, economic growth and creating new opportunities for its citizens regardless of race.
* **Education (By: Ying Qi)**
  + Singapore’s government puts a very high importance in the education system for Singaporeans and students to graduate with competent skills to excel in the workforce. This makes way for Singapore’s high recognition in the education sector globally, where there are many job opportunities and high employment rate for students who graduate from Singapore due to their high competence and knowledge. Education is also affordable in Singapore as the government heavily funds and provides various schemes for students to use, funding their education fees.

## Project Plan

* Project team organization

As team leader, **Ying Qi** oversees allocating assignments to team members, ensuring that all work is done on schedule, aiding with dataset integration, and working with the team to document project progress and identify possibilities for improvement.

**Irsyad** is a team co-leader, evaluating the team's progress toward project goals, conducting frequent meetings to discuss updates and problems, and coordinating with team members to document project progress, identify areas for improvement, and execute corrective action plans as needed.

**Valerian**, as a team member, is responsible for documenting project progress and ensuring that project updates are appropriately recorded and delivered to key stakeholders.

* Table

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  Description automatically generatedProject schedule and task allocation (Gantt chart)
* Software tools used for development.

**Power BI** was used to create the visualisations and report. **Microsoft Excel** was used to store datasets and import data to power BI. **Microsoft Word** was used to document our project development.

## Data Understanding, Visualisation, and Modelling

* Datasets chosen and visual charts used.

**Cost of living (By: Valerian)**

|  |  |
| --- | --- |
| Price Change | |
| <https://data.gov.sg/dataset/consumer-price-index-annual> | Stacked column chart |
| Habits | |
| <https://www.singstat.gov.sg/search-result?q=Labour%20participation#gsc.tab=0&gsc.q=Labour%20participation&gsc.page=1> | Matrix |
| Future | |
| <https://data.gov.sg/dataset/births-and-fertility-annual> | Line chart |

**Socio-cultural Environment (By: Irsyad)**

|  |  |
| --- | --- |
| Household by Ethnic and Resale Price | |
| <https://www.singstat.gov.sg/find-data/search-by-theme/households/households/latest-data> | Bar chart |
| <https://www.singstat.gov.sg/find-data/search-by-theme/economy/prices-and-price-indices/latest-data> | Line chart |
| Fertility Rate | |
| <https://www.singstat.gov.sg/find-data/search-by-theme/population/births-and-fertility/latest-data> | Line chart |
| Government Expenditure | |
| <https://www.singstat.gov.sg/find-data/search-by-theme/economy/public-finance/latest-data> | Line chart |
| Comcare Schemes | |
| <https://www.singstat.gov.sg/find-data/search-by-theme/society/community-services/latest-data> | Bar chart |
| Singapore Population | |
| <https://www.singstat.gov.sg/find-data/search-by-theme/population/population-and-population-structure/latest-data> | Line chart |

**Education (By: Ying Qi)**

|  |  |
| --- | --- |
| Number of Singaporean students | |
| Singapore – Education <https://www.trade.gov/country-commercial-guides/singapore-education> | Multi-row card |
| Education Statistics Digest 2021 MOE <https://www.moe.gov.sg/-/media/files/about-us/education-statistics-digest-2021.ashx?la=en&hash=9E7EFD9B8088817C207F8AE797037AAA2A49F167> |
| University rankings | |
| Leading universities as ranked by Times Higher Education in Asia in 2022 <https://www.statista.com.nyp.remotexs.co/statistics/226819/best-asian-universities-by-times-higher-education/> | Stacked bar chart |
| World university rankings for 2022/23, according to Times Higher Education <https://www.statista.com.nyp.remotexs.co/statistics/226681/world-university-rankings-by-times-higher-education/> | Stacked column chart |
| Number of Graduates | |
| Number of Full-Time University Graduates <https://tablebuilder.singstat.gov.sg/table/TS/M920121> | Line chart |
| Employment after Graduating | |
| Graduate Employment Survey - NTU, NUS, SIT, SMU, SUSS & SUTD <https://data.gov.sg/dataset/graduate-employment-survey-ntu-nus-sit-smu-suss-sutd> | Matrix and 3 Cards |
| Job opportunities | |
| Change in employment in Singapore in 2021, by industry <https://www.statista.com.nyp.remotexs.co/statistics/1241541/singapore-change-in-employment-by-industry/> | Stacked column chart |
| Job Vacancy by Industry and Occupational Group, Annual  <https://data.gov.sg/dataset/job-vacancy-by-industry-and-occupational-group-annual?resource_id=411996b4-be8c-4fdd-a6ab-ca90abbe116d> | Line chart |
| Government expenditure | |
| Government Expenditure on Education <https://tablebuilder.singstat.gov.sg/table/TS/M850011> | Stacked column chart and Card |
| Financing Education | |
| Methods of financing further education among students in Singapore in 2021 <https://www.statista.com.nyp.remotexs.co/statistics/1091572/singapore-methods-to-finance-further-education/> | Stacked column chart |
| School Life Expectancy | |
| School Life Expectancy <https://data.gov.sg/dataset/school-life-expectancy> | Line chart and Card |

* Describe the statistical models used and how the model results are linked to your hypothesis for decision-making.

**Cost of living (By: Valerian)**

A linear regression shown by charts shows the cost of living in Singapore to increase as a constant rate as the CPI of Singapore has only increase in the last decade. Additional research was carried out and the role cost of living played in Singapore's society may just impact the future of Singapore. Studies has shown that the decline of Singapore's crude birth-rate is directly linked to the rising prices and how it will only be worse from Generation Z and onwards. Although, the Singaporean government has tried their best to subsidies their citizens on areas like housing, public transportation and many more. Overall, the findings indicate that Singapore's cost of living will only impact its economy both short and long term is a less positive light. With rising costs of living causing the younger generation to take up jobs at earlier ages and adding the load of stress to keep up, Singapore’s population will decline more faster than ever. These findings will only give a sneak peek to the future of Singapore if the cost of living gets less affordable.

**Socio-cultural Environment (By: Irsyad)**

To test the hypothesis that Singapore is a superior living location, the study utilized linear regression analysis with government spending as the predictor variable and year as the response variable. The research revealed a constant growth in government expenditure over the years, as evidenced by the upward trend in the data points. Further investigation was conducted to test the sub-hypothesis of equitable opportunities for different races in Singapore. The results indicated that the government has been actively promoting equal opportunities through educational programs, as demonstrated by the increase in educational expenditures and the number of Malays obtaining university degrees. In general, the findings suggest that Singapore is progressing in the right direction in terms of providing equal opportunities for different races. While there is room for improvement, the rise in government spending and the advancement in educational performance among Malays serve as positive indicators that the country prioritizes equitable opportunities. These findings can have significant implications for policy and program decisions in Singapore that aim to foster diversity and equality.

**Education (By: Ying Qi)**

For the datasets on Number of Full-Time University Graduates, Government Expenditure on Education, and School Life Expectancy, a linear regression using forecast is used as one of the statistical modelling techniques. Based on all 3 forecasts, there is a positive outlook (an increasing trend) in terms of future values. For example, for Number of Full-Time University Graduates, since there has been a forecasted increase in number of graduates, it shows that the number of Singaporeans attaining a degree increases, resulting in a positive outlook for the education sector as it shows a higher chance and larger feasibility of graduating with a degree in Singapore. For Government Expenditure on Education, since the forecasted values show an increase, this means that the government continues to put an importance on education, and investing more and more funds, continuing to improve the standards of the education sector in Singapore. For School Life Expectancy, the forecasted values show an overall increase in the average number of years of school life expectancy. This means that based on the strong government involvement in the education sector, this allows more Singaporeans to experience longer studying periods, allowing them to achieve a full-length education route in their life. Overall, based on the 3 positive trends of the forecasts, Singapore’s education will continue to improve and flourish, proving the hypothesis that Singapore is indeed a good place to live/work in based on the factor on Education.

For the datasets on Number of Full-Time University Graduates, and Government Expenditure on Education, a decomposition tree is used as the other statistical modelling technique. Based on both decomposition trees, it can be visualized to show the different courses and different levels that the graduates and expenditure come from. For example, for the Number of Full-Time University Graduates, the decomposition tree shows the drill down on number of graduates for each year, followed by gender, and lastly by course. This shows target users what the probability and standards of graduating from the course they choose to analyse is and helps them make a more informed decision on planning their education route. For example. For the Government Expenditure on Education, the decomposition tree shows the drill down on the amount of expenditure put into education for each year, followed by type of expenditure, level of education, and lastly, sub-level of education. This shows target users the way that the government plans and splits the expenditure for each year, showcasing the amount that the government invests into each level of education. This helps to show that the government plans well in dividing the expenditure for the different areas of education. Overall, based on the 2 decomposition tree, it can be seen that the Singapore’s education is well planned by government expenditure, and the different graduation rate of different courses. The good planning of expenditure and many graduates from the different courses all show the good quality of education in Singapore, proving the hypothesis that Singapore is a good place to stay/work in, based on the factor of Education.

* Screenshots of Dashboards *(with descriptions - and highlight any special features)*

**Cost of living (By: Valerian)**

Graphical user interface, application, Word

Description automatically generated

The data presented shows a bar chart controlled and displayed by respective areas of Singapore's CPI over a decade. The findings show that Singapore's CPI overall over the years has only increase exponentially. However, when broken down to different areas, it shows that Singapore's CPI on areas such as accommodation has continue to get better. When it comes to self-care and just indulgence of pleasure, it shows that the CPI has more improved at all in the past decade, concluding that having fun is a privilege among Singaporeans. There is also another bar chart displaying the inflation of each year in Singapore. It shows that Singapore has suffered a surge in inflation in the past three years and projected to have a more stable rate in the coming years. This shows that Singapore will only continue to get more expensive and that the cost of living can be felt due to the sudden surge of inflation. On top several bar charts shows what Singaporeans keep in mind when saving. The data shows that generation Z is very savvy and frugal as a lot are already starting to save for the future.

Chart

Description automatically generated with medium confidence

The data presents a table which is sorted by age group and year to display the percentage of those who are working or participating in labour. A slicer displaying the age groups where the data is segregated is used to filter out the data. The data shows a trend of more younger people (ages 15-19) taking up jobs and as well as more older people ages from 65-69 still working despite the retirement age in Singapore being 63 years old. It is evident that more people are trying to stay employed based on the statistics and it could be directly linked to how unaffordable Singapore is. In terms of financing education in Singapore, majority of Singaporean students (75%) depends on some kind of scholarship given. The data also shows that paying off school fees by doing part-time work is the third most frequent answer, meaning that about half of the population depended on their part-time job to fund their education. Although the government has subsidies so much in our education, Singapore still remains quite hard to stay afloat despite the subsidies. A bar chart is then used to display the percentage of those who save based on age group. The data shows that 70% of young adults ages between 15-24 are already saving money. Adults ages 25 and onwards had 78% of their population to be saving. This shows that the younger Singaporean generation are getting more frugal and savvier in terms of finances despite a huge chunk of the generation still considered as minors who should be mainly pre-occupied with their studies. This shows that the habits Generation Z picked up on are survival tactics in a way as many of them have a grasp of financial literacy and that they have to start producing income as soon as possible.

Graphical user interface, application

Description automatically generated

The data shows a linear regression under the data for crude birth rate in Singapore over the years on a span of a decade. The data projected a consistently regressing chart showing a constant decline on the birth-rate of Singapore. With knowing that how many already view even having fun to be a luxury and Generation Z being more frugal, there will be a huge possibility that the birth rate will only continue to decline as time goes by. This is due to having a child to be expensive and many would surely think that a child is more of a liability. This can be shown through government subsidies to encourage more children produced. The 15% decline over the span of a decade will only grow bigger as time goes by. This would negatively affect Singapore in almost all aspect as there will be less people to replace older generations in terms of workforce, less people to boost the economy of Singapore. Another linear regression is used to show the data of resale accommodation depending on the description and capacity of the place. The data shows that on average there is an exponential increase in property prices over the decade. This will only promote more Singaporeans to not have children in order to be able to afford a house.

**Socio-cultural Environment (By: Irsyad)**

*Graphical user interface, application

Description automatically generated*

The data presented in a line chart indicates that the population of the three primary ethnic groups in a particular country has remained relatively stagnant over the years. However, in 2016, there was a noticeable trend where the population of Malays began to increase steadily, surpassing that of Indians. Additionally, a comparison of the line chart for total fertility rate by ethnic group reveals that the fertility rate for Malays has remained steady at 1.8 for several years. In contrast, the Chinese and Indian populations have had fertility rates in the 1.0 plus range. However, in 2018, there was a significant decrease in the fertility rate for both the Chinese and Indian populations, dropping to 0.98 and 0.99, respectively. This trend continued through 2020. Therefore, while the population of Malays has been on the rise, the overall fertility rate in the country has been declining, especially among the Chinese and Indian populations.

Graphical user interface, application

Description automatically generated

The government’s emphasis on education in the fields of the university and secondary/junior is evident. The prioritization of education underscores the value placed on ensuring that Singapore’s citizens are equipped with the knowledge and skills needed to succeed. Investing in universities enables Singapore to remain at the forefront of innovation and research, fostering economic growth and creating new opportunities for citizens. Likewise, investment in secondary schools and junior colleges ensures that Singapore’s youth receive a high-quality education, providing them with the necessary skills and knowledge to succeed in the future. By investing in these educational institutions, the government is working towards building a well-educated and highly skilled workforce for the future.

Graphical user interface, application, Word

Description automatically generated

The chart displays data that shows the highest level of education attained by individuals of different races in Singapore. Notably, the chart highlights the educational attainment of the Malay population. In 2015, only 8,100 Malays held a university degree. However, by 2020, this number had increased considerably to 14,200. This increase is indicative of the government's dedication to promoting education and providing equal opportunities for all races in Singapore. The data reflects the success of the government's policies in facilitating greater access to higher education for Malay individuals, which is crucial in developing a highly educated and skilled workforce.

Chart

Description automatically generated

The presented chart provides valuable insights into the differences in living conditions of various races in Singapore. Specifically, the data indicate that in 2015, there were 41,000 Chinese households, 8,000 Indian households, and 5,000 Malay households living in 1 and 2-room flats. However, in 2020, this picture changed, with an increase in the number of Chinese households to 54,000, and the number of Indian households to 9,000. The most significant change was seen in the Malay population, with an increase in Malay households to 24,000. This increase could suggest that the government has implemented policies or schemes to support and improve the living conditions of the Malay population in Singapore.

Chart

Description automatically generated with low confidence

This focuses on the relationship between household income and resale prices in Singapore. In 2015, there were 18,900 Chinese, 8,500 Indians, and 3,500 Malays earning below 1,000. By 2020, the number of Chinese earning below 1,000 has increased to 21,223, while only 1,726 Indians and 3,701 Malays were earning below 1,000. This data suggests that household income plays a significant role in determining the resale price of homes in Singapore. An increase in the number of Malays earning below 1,000 could indicate a lower ability to afford a resale home. However, it's important to consider the government's support and subsidies that could mitigate the impact of lower household income on resale prices.

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A linear regression analysis was conducted to investigate government expenditure trends in Singapore. The analysis revealed a consistent trend in government expenditure over the years, as indicated by a dot on the chart. These findings suggest that the government in Singapore is committed to promoting equal opportunities, particularly through education-supporting initiatives. The increase in government expenditure and the rise in the number of Malays with university qualifications are indicators of progress towards promoting equality and diversity in Singapore.

Graphical user interface

Description automatically generated with medium confidence

In Singapore, the government's Comcare schemes provide subsidies to households in need of financial support. Between 2015 and 2020, there was a significant increase in the number of Comcare subsidies provided to households, rising from 39,458 to 46,147, indicating the government's continued efforts to support its citizens. This increase translates to a 17.2% rise, showcasing the government's commitment to improving the lives of its citizens, irrespective of race or ethnicity.

**Education (By: Ying Qi)**

Graphical user interface, chart, line chart

Description automatically generated

The year slicer on the top left helps to filter the data on the visuals from year 2011 to 2021. The card beside it (top middle) shows the number of Singaporean students studying locally (420726) and those studying overseas (23456) in 2021. The stacked bar chart beside the card (top right) shows the rankings of the top 10 Asia Universities in 2021, where NUS places 3rd, and NTU places 5th. This shows that Singapore’s education is well recognised globally. This stacked column chart below it (bottom right) shows the rankings of the top 25 World Universities for 2022/23, where NUS places 19th overall. This shows that Singapore’s education is well recognised globally. The line chart on the bottom right shows the number of full-time university graduates in Singapore from 2011 to 2021. This shows an overall increasing trend, meaning that Singapore’s education standards are getting better and more people are graduating with a university degree.

Graphical user interface, chart, application

Description automatically generated

The year slicer on the left helps to filter the data on the visuals from year 2011 to 2021. The matrix on the top right shows the overall employment rate, the mean basic monthly salary, and mean gross monthly salary of Singapore University graduates (NUS, NTS, SMU, SUSS, SUTD, SIT) from 2013 to 2021. The high employment rates and stable incomes all prove that pursuing education in Singapore can promise a good job employment. The card on the top left shows the average overall employment rate of the graduates (92%) from the matrix visualisation of years 2013 to 2021. The card beside it (top middle) shows the average mean basic monthly salary of the graduates ($3.57k) from the matrix visualisation of years 2013 to 2021. The card below it (middle) shows the average mean gross monthly salary of the graduates ($3.68k) from the matrix visualisation of years 2013 to 2021. The bottom left is a stacked column chart that shows the number of jobs created by the different industries in 2021. The red bars indicate a decrease/removal in jobs of certain industries, while blue indicates an increase/creation of jobs. The line chart beside it (bottom right) shows the number of job vacancy from 2011 to 2021, where fluctuations can be seen and a sudden increase in number of job vacancies occurs in 2021. This chart proves that despite the decrease in jobs being created as seen in the number of jobs created visualisation, there are still many job vacancies and opportunities available in 2021.

Graphical user interface, chart, application

Description automatically generated

The year slicer on the top left helps to filter the data on the visuals from year 2011 to 2020. The stacked column chart on the bottom left shows the total government expenditure invested from 2011 to 2021, where each column is split into the types of expenditure. From 2011 to 2021, the total amount of expenditure invested by the government has never gone below $10 billion and there is an overall increase in amount invested. The card on the top middle shows the overall total amount of government expenditure on education ($132.59 billion) from 2011 to 2021. The stacked column chart on the bottom right shows the different methods used by Singaporeans to pay for education in Singapore in 2021. The pink columns show the methods funded/provided by the government. The line chart above it (top right) shows the school life expectancy from 2011 to 2020 for a child (aged 6, which covers Primary school education onwards). There is an overall increase in the number of years for the school life expectancy, where in 2020, an average child is able to complete a full education route in Singapore. This card beside it (middle) shows the average school life expectancy in years (16.15) from 2011 to 2020.

Graphical user interface, chart, line chart

Description automatically generated

The linear regression performed on the top left forecasts the number of graduates for the next 3 years. This shows a positive increase in the number of graduates for the year of 2022 to 2024, proving that education in Singapore is a good factor that supports our hypothesis as more and more students are able to attain a university degree. The linear regression performed on the top right forecasts the school life expectancy in years for the next 4 years. This shows a positive increase in the number of years for the year of 2021 to 2024, proving that education in Singapore is a good factor that supports our hypothesis as it ensures students a full education route. The linear regression performed at the bottom forecasts the amount of government expenditure on education for the next 3 years. This shows a positive increase in the government expenditure for the year of 2022 to 2024, proving that education in Singapore is a good factor that supports our hypothesis as the government cares about education and does their part to help fund education for Singaporeans.

Graphical user interface, application

Description automatically generated

The decomposition tree on the top shows the different drill downs of levels on the type of graduates, from year to gender, and to the different courses. The wide variety of graduates from different courses show that education in Singapore is good as it offers many educational opportunities for different areas of interest. The decomposition tree at the bottom shows the different drill downs of levels on the type of government expenditure, from year to type of expenditure, to the different levels, and to the different sub-levels if any. The good planning of funding in the different sectors of education show that education in Singapore is good as the government ensures that education for all levels and types are well covered for.

## Problems Encountered

* Some problems encountered.

We experienced a difference of opinion within our project team regarding the most effective approach to undertake the research phase. However, by defining precise research objectives and distributing specific tasks to each member of the team, we created an environment where everyone could contribute their thoughts and work together towards a shared aim. Another problem we encountered was about the limitation of datasets. Some datasets did not fully visualize the data in a clear and precise format desired, while some datasets were not up to date. To solve these issues, we extended our search to academic journals and organization reports.

## Future Enhancements

* Future enhancements

To enhance the quality and effectiveness of our report, we intend to broaden the data's year range to improve the datasets correctness and dependability, as well as to enhance the user experience by adding additional interactions between the datasets and producing more user-friendly infographics. We will also integrate more in-depth criteria to deepen the study and broaden the capabilities and coverage of the Power BI dataset and dashboard on all factors that determine the quality of living in Singapore. This involves extending the dataset to incorporate more detailed information on cost, educational, and race-based demographics, and employment patterns, resulting in a more accurate and nuanced assessment of the state of equal chances. We will also add new visualizations to the dashboard to allow users to compare and assess statistics on employment opportunities, income, education, racial equality, and other critical markers of quality living in Singapore.

## Conclusion

* Summarise the works, provide results interpretation, and conclude whether the outcome of the analysis fit the project expectation.

**Cost of living (By: Valerian)**

* In conclusion, the government tried their best to subsidies as much as possible for its citizens. But with the rate of inflation Singapore is facing, rising prices and the amount of stress and pressure Generation Z has to take over, it will only bring down Singapore both in the short term and long term. As even having fun is becoming a privilege, this will worsen the crude birth rate of Singaporeans if many prefer not to have kids by viewing them as liabilities and would much rather purchase accommodation, luxuries and etc in the current economy. This will only improve if Singapore continues to maintain business relations with other nations, the government being more generous on subsidies and overall, the next generation leading Singapore into a better Singapore.

**Socio-cultural Environment (By: Irsyad)**

* In conclusion, increasing support to lower-income households is one strategy to create more social fairness and inclusion for all races in Singapore. This might be achieved by expanding current programs like Comcare or launching new efforts to give more substantial financial support to individuals in need. By doing so, the government might assist to alleviate any socioeconomic discrepancies in educational and job prospects. This will eventually lead to a more fair and equal society for all Singaporeans.

**Education (By: Ying Qi)**

* In conclusion, the continuous efforts of the government, the good recognition of Singapore’s education system, and the good and rising employment rate of Singapore graduates shows that Singapore’s education system is of good quality, all play a part in proving that Singapore’s education system is of good to prove that Singapore is a good place to stay/work in.