BIZ ANALYTICS

SUSS SINGAPORE UNIVERSITY OF SOCIAL SCIENCES

MARCH 2023 QUARTERLY ISSUE

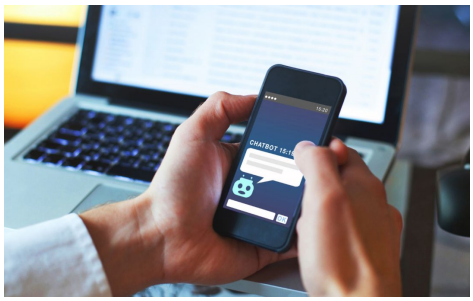
Technology has brought many positive changes in our lives and has been used for good in various ways to improve social, environmental and economic outcomes. Some examples include improving healthcare processes and promoting sustainability.

The theme of this newsletter is “Tech for Good”. We explore how different organisations leverage technology to perform daily tasks more efficiently and effectively. We also discuss the relevance of technology to these organisations and how different software and platforms intertwine and cater to their needs. We share our interview with staff from World Vision International (Singapore) to understand more about leveraging data insights in a non-profit organisation. Lastly, we examine the effectiveness of our “national hero”, ‘Ask Jamie’, in helping Singaporeans to navigate through various online government services on-hand.

As 2022 concluded, the Business Analytics Interest Group (BAIG) organised several events for its members, including the Data Visualisation Challenge. Started with beginner-friendly workshops that introduced basic coding skills and data visualisation techniques, the Challenge gave the participants an opportunity to kick-start their coding journey, spurring them to put on their thinking cap to look for innovative solutions to tackle the challenge.

Of course, we did not forget our quarterly Python Challenge! Put yourself up for a teeny-weeny-mini Python Challenge. (psst, answer for the past issue’s Challenge included!)

Tech for Good



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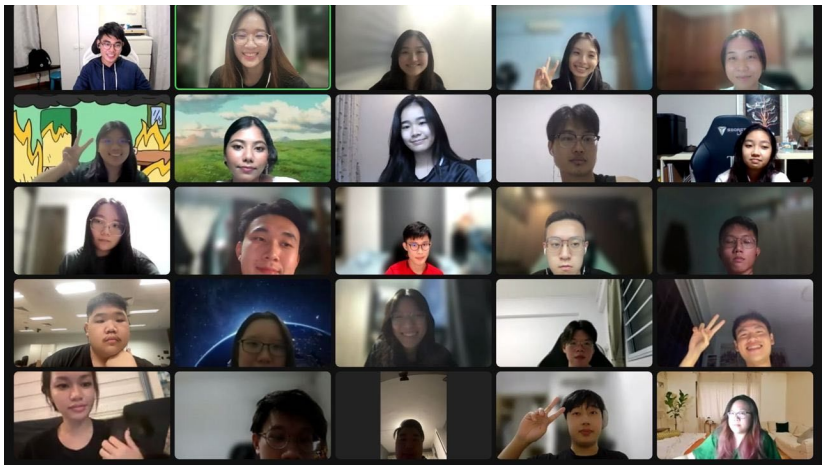
BAIG Python Challenge 2022

Amidst the celebration of the December holidays, year-1 students were welcomed to join the **Python Challenge**, organised by the BAIG. This Challenge tested participants' analytical skills and knowledge using Python language. Participants were teamed up into groups of 4, to attempt the problem statement using Python language. To help the participants get started, two rounds of workshops were held by the seniors, to teach them basic Python language using Jupyter Notebook.

Each group had to produce their Python Jupyter Notebook and give an 8-10 mins video presentation to showcase their data insights and recommendations for the problem statement in 4 weeks. Their work was graded by the quality of the group's effort in cleaning the data to the aesthetics of the visualisation produced. The quality of data storytelling and soundness of recommendations were also taken into consideration.



Python Challenge Workshop

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Let's hear from the winning team, consisting of Grace, Venise, Demi and Sherry, about their experiences in joining the Python Challenge and how they felt after awarded first place:

How did your team feel after winning first place in the Python Challenge?

We felt happy yet surprised as we did not expect to be winning first place. When the winners in 2nd and 3rd places were announced, we felt dejected as we were initially expecting to get 2nd or 3rd. Especially after viewing their graphs, we thought that their visualisations were better than ours and we did not stand a chance to win any more. Therefore, it was really unexpected to win first place!

Were there any challenges that your team faced and how did you manage to overcome them?

All of us were busy and only had time for discussion in the last two weeks from submission. We came together to discuss the insights we wanted to present and allocated the tasks based on their complexity. We allocated the more complex tasks to members who had prior Python knowledge. After that, we combined the python files and videos within one night!

Some of us even spent the wee hours designing the slides and editing the video. Collaborating with one another to solve minor issues like categorising data and presenting the data helped us overcome technical challenges. Googling and self-learning Python was not easy, but it was fulfilling and rewarding to see our data coming to life and making sense.

1st Place: Grace Choo Le Yi, Venise Chan Jing Tong, Demi Low Zhi Xin, Sherry Lim

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BAIG Python Challenge 2022

What did you enjoy the most in this Python Challenge?

Some of our members love coding and were really motivated to join the Python Challenge. For the members who did not have prior Python background, it was a good opportunity to experience what it was like to code and make sense of raw data to create interesting insights which were presented via visualisation.

Furthermore, it was interesting to see "real-life" scenarios and data coming to life and applying what we know about Python and data visualisation, giving us a good insight into what our future work life might be like or a possible pathway in terms of career in the Data Analytics industry.

The Python Challenge is a great way for students who might be interested to learn Python for the first time and it also allows students who have more expertise in Python to challenge themselves. We would like to thank all for participating and making the Python Challenge for 2022 a successful one!

2nd Place: Jason Chew Zhen Yang, Albinius Tay, Lim Hui Yu

3rd Place: Wong Xin Yu, Tan Ki Siong, Lim Ke Ying, Jamie, Chew Yu Heng, Jovin

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Leveraging Data for Good at World Vision

In an increasingly data-driven landscape, various organisations around the world are leveraging business and operational data to enhance their business processes. Specifically, in non-profit organisations, data provides insights to optimise target approaches for goals and programmes, track trends, make informed decisions and strategise for improving and enhancing intervention programmes that enable the deepening of the organisations' commitment to where the most vulnerable and pressing needs are found.

In this article, we will be focusing on a non-profit organisation called **World Vision International**. World Vision International is a humanitarian organisation that serves all people, regardless of religion, race, ethnicity, or gender. It is dedicated to working with children, families, and their communities worldwide to reach their full potential by tackling the root causes of poverty and injustice. With a global reach of nearly 200 million children in almost 100 countries, it aims to empower children and their communities out of poverty and promote long-term sustainable development.

World Vision International staff carrying out medical and nutrition outreach in a settlement for the displaced in Baidoa, Somalia (Credits: World Vision International)

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World Vision®

Leveraging Data for Good at World Vision

To understand more about leveraging data insights in a non-profit organisation, we spoke to three individuals from World Vision International (Singapore) to understand how they use data in their roles for the betterment of the vulnerable children and communities they serve, and how they provide a platform for residents of Singapore to understand and be the voice for the vulnerable in Singapore and overseas. We spoke to:

Patrick Koh,
Manager, Information and Communications Technology (ICT)

Cai Chengji,
Manager, Supporter Engagement

Ernest Ho,
Manager, Donor Operations

World Vision Afghanistan National Director, Asuntha Charles, visits the Health & Nutrition programme in Herat province, Afghanistan (Credits: World Vision International)

Children from the Sambour Area Programme in Cambodia taking part in "Chosen", an initiative that allows a child to select their sponsor by choosing their photo (Credits: World Vision International)

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The first person we spoke to was **Mr Patrick Koh**, Manager of the **Information and Communications Technology (ICT) Department** at World Vision Singapore.

Could you share a little bit about your role in World Vision?

I oversee the daily IT functions that are required by our operations, acquisitions and marketing teams. Part of my portfolio is to redesign our IT infrastructure to future-proof our initiatives and endeavours. This encompasses both applications and cloud - and in relation to data processing - to group our data silos so that they form a unified data repository.

What are the types of data that you manage in your role and why are they important for the work?

We have multiple systems - Donor Management, Customer Relationship Management (CRM), eCommerce, among others. All of them provide an insight to the business workings of our campaigns and initiatives. The data within these systems helps us to optimise our approaches.

Is there anything that Business Analytics students should keep in mind if they would like to join a non-profit organisation?

If you are someone who desires to use tech (and data) for good - a good starting point is to ask your future employers on their alignment between their holistic mission and their strategic vision for data analytics, and how you can contribute to empower their organisation in that manner.

Youth in Singapore taking part in the 30-Hour Famine Camp (30HFC). The 30HFC allows the youth to walk in the shoes of poor communities in developing regions, making them more informed and empathetic advocates for these communities (Credits: World Vision Singapore)

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The second person we spoke to was **Mr Cai Chengji**, Manager of the **Supporter Engagement Department** at World Vision Singapore.

Could you share a little bit about your role in World Vision?

I lead the supporter engagement team, focusing on providing a meaningful supporter experience. I oversee the supporter journey from on-boarding, providing impact reports, to facilitating donation and addressing their enquiries. I also monitor the progress of the various engagement plans we have planned for donors.

How do you leverage the analysis done by your team?

We analyse donor giving patterns and preferences to plan our engagement so that our donors receive what is meaningful and relevant to them. We also analyse the reasons why certain donors stop giving to understand the gaps in our supporter journey and how we can improve them.

What software or programs do you use to analyse or visualise data?

We use Google Looker Studio (formerly known as Data Studio) for visualisation and use the SQL Server Reporting Services (SSRS) for analysis.

Is there anything that Business Analytics students should keep in mind if they would like to join a non-profit organisation?

As a non-profit organisation, we may not always have the resources to use the latest technology or have the exposure to participate in ground-breaking projects as consideration must be put into being good stewards of our resources and funds. Hence, it is important to optimise existing resources and leverage them to deliver the greatest impact to the beneficiaries and the organisation.

Rohingya Child Refugees in Bangladesh benefitting from a fresh food voucher initiative funded by World Vision Singapore (Credits: World Vision International)

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The last person we spoke to was **Mr Ernest Ho**, Manager of the **Donor Operations Department** at World Vision Singapore.

Could you share a little bit about your role in World Vision?

I lead the Donor Operations team, where we maintain the data integrity between the donor and the beneficiaries. We also compile the donation data for management decisions.

What are some examples of work done using the data that you compiled?

We account for where donor contributions are used. We generate relevant contact lists for our appeal outreaches. We also identify and assist donors who have difficulties in completing their donations or miss their regular donation pledges.

What software or programs do you use to extract and visualise data?

We use online analytical processing (OLAP) to extract the data. We use either Excel charts or Power BI to visualise the data.

Is there anything that Business Analytics students should keep in mind if they would like to join a non-profit organisation?

When you consider joining a non-profit organisation, consult your trusted peers or elders for thoughts and advice. At the same time, develop crucial analytical skills that suit the beneficiaries and cause of the organisation.

To learn more about the work of World Vision Singapore and their various initiatives, do visit their website and social media pages below!

worldvision.org.sg

@worldvisionsg and @worldvisionyouthsg

World Vision Singapore

World Vision

Ukrainian child refugees attending a Christmas Party organised by World Vision at a refugee accommodation centre in Moldova (Credits: World Vision International)

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GOVTECH SINGAPORE

Helping Singaporeans through an AI-based virtual chatbot

The many faces of AskJamie
(Credits: Reddit - r/Singapore)

AskJamie and its Purpose in Singapore's Smart Nation Initiative

AskJamie is a virtual assistant (VA) developed in 2014 by the Government Technology Agency of Singapore (GovTech) and Smart Nation and Digital Government Office (SNDGO) to drive Singapore's Smart Nation initiative. With the use of VA and artificial intelligence (AI) technology, AskJamie aims to simplify citizen interactions and navigate Singaporeans and businesses through online government services, which in turn improves service delivery.

How does AskJamie simplify citizen interactions with online government services?

AskJamie uses AI technology to answer queries within specific domains by identifying keywords in questions and providing accurate replies. This makes it possible for citizens who prefer to search information online to receive direct responses. In turn, this allows manpower from contact centre agencies to be directed to handle complex issues and queries. AskJamie uses a Natural Language Processing (NLP) engine to understand the questions posed by Singaporeans and give responses accordingly. This technology can ask follow-up questions in situations where questions require multiple permutations of answers, improving the response to address the user's inquiry.

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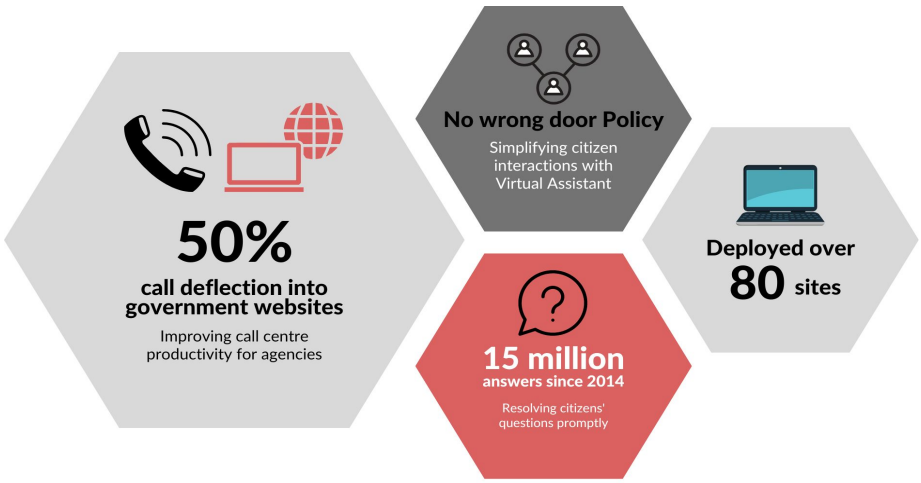

AskJamie self-service capability for GovTech - the Government Technology Agency of Singapore (Credits: Govtech)

How does NLP engine enable AskJamie to comprehend and respond to citizen inquiries?

The Singapore government has utilised AskJamie as a vital solution in providing 24/7 virtual assistance, bringing numerous benefits for both citizens and government agencies. Singaporeans can gain greater accessibility to the agencies and greater convenience in receiving prompt and direct answers to their queries. They can engage in better user experience through conversational digital interactions. In addition, the need for government agencies to incorporate call centres into their operations can be reduced.

AskJamie's extended outreach channels and their role in improving efficiency

The implementation of AskJamie has not only made services more accessible to citizens but also streamlined the government's internal processes. By incorporating AskJamie into the government's digital services, Singapore has taken a significant step towards becoming a smart nation. AskJamie has helped to ensure that government services remain efficient, accessible, and relevant in a rapidly advancing technological landscape.

The lady we are all very familiar with (Credits: Reddit - r/Singapore)

In conclusion, AskJamie's VA technology has been an important innovation in Singapore's Smart Nation initiative. The implementation of AI technology has simplified citizen interactions and enabled self-service, reduced the need for contact centre agencies, improved response times, and ultimately made government services more accessible to the public. With its impressive results, AskJamie has demonstrated the effectiveness of VA technology in streamlining government services and making them more accessible to the public.

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Mini Python Challenge

Write a function that takes a list of numbers and returns a list with two elements:

The first element should be the sum of all even numbers in the list.
The second element should be the sum of all odd numbers in the list.

Example:

```
sum_odd_and_even([1, 2, 3, 4, 5, 6]) → [12, 9]
# 2 + 4 + 6 = 12 and 1 + 3 + 5 = 9

sum_odd_and_even([-1, -2, -3, -4, -5, -6]) → [-12, -9])

sum_odd_and_even([0, 0]) → [0, 0])
```

Note:
Count 0 as an even number.

Look out for the solutions in the next issue!

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Solution to Mini Python Challenge (December 2022 Issue)

```python
# Definition for singly-linked list.
class ListNode(object):
    def __init__(self, val=0, next=None):
        self.val = val
        self.next = next
class Solution(object):
    def mergeTwoLists(self, list1, list2):
        """
        :type list1: Optional[ListNode]
        :type list2: Optional[ListNode]
        :rtype: Optional[ListNode]
        """
        if list1 is None:
            return list2

        if list2 is None:
            return list1

        if list1.val < list2.val:
            temp = head = ListNode(list1.val)
            list1 = list1.next
        else:
            temp = head = ListNode(list2.val)
            list2 = list2.next

        while (list1 is not None or list2 is not None):
            if (list1 is None and list2 is not None):
                temp.next = ListNode(list2.val)
                list2 = list2.next

            elif (list1 is not None and list2 is None):
                temp.next = ListNode(list1.val)
                list1 = list1.next

            else:
                if(list1.val > list2.val):
                    temp.next = ListNode(list2.val)
                    list2 = list2.next
                else:
                    temp.next = ListNode(list1.val)
                    list1 = list1.next

            temp = temp.next

        return head
```