**Note to student:**

1. Ensure that you **include this cover sheet** as the first page of your reflection journal.
2. Ensure that you **read, understand and complete the Declaration of Original Work** below.
3. Ensure that you **clearly provide all the following details** for the work to be accurately identified as yours:

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| **Admission No.** | P2006264 | **S/N** |  |
| **Lecturer** | **Augustine GOH** | **SIP Class (e.g., GD/SIP/FT/1B01)** | SIP/1A/13 |

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**“Plagiarism occurs when you take sentences or paragraphs or even the whole article written by another person and pass it off as your own work without acknowledging the author or the original source. This is actually cheating and is a breach of examination rules that will not be condoned by the Polytechnic.”**

**(Singapore Polytechnic, 2018)**

* Any student who cheats, attempts to cheat or breaches any examination rules will face disciplinary action. You are to cite all your sources in instances where you have used text, images, diagrams and other types of information from the Internet or other published sources.
* You should cite and paraphrase your sources to avoid plagiarism.
* Students who knowingly assisted in the plagiarism will also be penalised. Hence, do not provide your work to any other student for any purpose whatsoever as you will be held accountable in the event that you have copied another person’s work or allowed your work to be copied by another student.
* Please refer to deck on plagiarism on BB for more details.

**Declaration of Original Work**

Singapore Polytechnic views plagiarism as a very serious offence. To strengthen your academic credibility and demonstrate your personal integrity, it is important that you check and confirm that your work meets the following conditions. **All boxes must be ticked**, **failing which 5 marks will be deducted.**

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| I confirm that all work contained herein is my own and not plagiarised. |  |
|  |  |
| I have properly cited all my sources in instances where I have used text, images,  diagrams and other types of information from the Internet or other published sources. |  |
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| I have not provided my work to any other student for any purpose whatsoever. |  |
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| I understand that I will be held accountable in the event that I have copied another person’s work or allowed my work to be copied by another student. |  |

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| **1. KNOWLEDGE OF PROBLEM (35 marks)** Using evidence from your primary and secondary research, explain the insights that you have gathered about your problem and why your project is relevant/important to our society. **(Max of 500 words)** |
| In total, food waste accounts up to 12 per cent of the total waste generated in Singapore every year (NEA, 2022). With Semakau Landfill, Singapore’s only offshore landfill to be expected to be fully filled by 2035 the government launched in 2019, the Zero Waste Masterplan which aims to reduce waste sent to Semakau Landfill each day by 2030. This would extend the lifespan of the landfill beyond 2035 (NEA, 2020).  This however is only a temporary measure to prolong the inevitable, to when the landfill is fully filled up, in which Singapore will struggle to properly dispose of its waste. Singapore urgently needs to come up with new innovative and sustainable methods to facilitate waste management way beyond after the landfill has been fully filled up.  As one of the biggest waste streams, the amount of food waste generated have increased by around 20% over the last 10 years, with 2019 generating a total of 744 million kg of food waste (Towards Zero Waste, n.d.). Typically, food wastage occurs mainly from consumers over-ordering and storing food improperly (Lim, 2014).  As more food is wasted each passing year, more food has to be sourced from global exporters to meet the food demand, affecting the food security of Singapore who imports over 90% of our food supply. Furthermore, more waste disposal facilities will have to be built to properly manage the increasing amount waste in our land-scarce city, thus making it unsustainable (Towards Zero Waste, n.d.).  All of this signifies that food waste is a very relevant and major issue in modern Singapore that needs to be urgently addressed. Hence, my group have chosen food waste as its issue with our project statement, “How can we encourage polytechnic students to reduce the amount of food waste generated outside their homes”.  Through primary research via interviews conducted by my group, we have gained insights to polytechnic students as they face various challenges that ultimately contributes to them wasting food when eating out.  For example, one instance that contributed to food wastage by polytechnic students is the type of food being thrown away. It is found that majority of users throw away vegetables such as cucumbers because they dislike it or have no intention of eating it. Another type of food thrown are soups as they tend to go unfinished.  Another example is that users frequently over-order food when with others. This is primarily because peer pressure where it is appropriate to order the same amount of food as peers. This further exacerbate the amount of food waste generated as users are unable to finish meals.  With little food left on the plate, users are also not inclined to take food back home if they could not finish it as there is hardly any justification of them doing so. They can hardly make use of the miniscule amounts of food left, without even factoring the cost of takeaways. Even if users decide to takeaway, they run into the problem of forgetting about them. Once the food turns bad, users will still inevitably throw them away.  **Word count: \_498\_** |
| **1a). Citations (5 marks)** Please cite your sources clearly. Do take note that citations include in-text as well as full references for all sources taken from the internet. Use Harvard format for your citations. References Lim, C., 2014. *Challenge | Reducing Food Waste - Public Service Division.* [Online]  Available at: https://www.psd.gov.sg/challenge/ideas/deep-dive/reducing-food-waste [Accessed 4 June 2022].  NEA, 2020. *Semakau Landfill 20th Anniversary - NEA.* [Online]  Available at: https://www.nea.gov.sg/corporate-functions/resources/publications/books-journals-and-magazines/envision-lite/june-july-2020/semakau-landfill-20th-anniversary [Accessed 2 June 2022].  NEA, 2022. *Food Waste Management - NEA.* [Online]  Available at: https://www.nea.gov.sg/our-services/waste-management/3r-programmes-and-resources/food-waste-management [Accessed 2 June 2022].  Towards Zero Waste, n.d. *Food Waste - Towards Zero Waste.* [Online]  Available at: https://www.towardszerowaste.gov.sg/foodwaste/#:~:text=Food%20waste%20is%20one%20of,around%2051%2C000%20double%20decker%20buses [Accessed 2 June 2022]. |

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| **2. KNOWLEDGE OF DT PROCESS (60 marks)**  Explain how you applied the DT tools (e.g., SPICE, POEMS, interviews & observations, clustering & insight gathering, Persona) to help you determine your persona’s needs. Use specific examples from your project to justify your interpr­etations. **(Max of 700 words)** |
| **Figure 1.** SPICE to help understand more about polytechnic student’s  perspectives on food waste  One design thinking tool I have used for my project is SPICE. SPICE enables me to gain a broader understanding of my issue, food waste from the perspective of my primary users, polytechnic students. By using SPICE as the basis for creation of interview questions, I was able to gain a deeper understanding of the various challenges faced by users, helping me unify and determine the needs of my future persona.  One aspect of SPICE, social allowed me to craft interview questions asking about social well-being of users in relation to food waste. With questions such as “Who do you normally eat with when you eat out?”, “Does who you are with affect the amount of food you order, on average per person?” and more, I was able to gain a deeper insight about how relationships of users such as friends affects the amount of food they waste. For example, users do over-order more often when with others and in turn, waste more food when left unfinished.  Another aspect of SPICE, emotional, allowed me to gain deeper insights to the emotional well-being of my users about food waste. With questions such as “how do you feel when wasting unfinished food outside” , “Have you seen posters or any other media about food waste? What emotions do you feel when you see them? Why?” and more, I gained insights such as how most users agree that they felt bad when wasting food.  Lastly, physical in SPICE allows me to gain a greater understanding of experiences of users relating to the physical environments about food waste. With questions such as “Where do you usually go to eat when you are out?” , “How does the atmosphere of the restaurant you are eating at influence the amount of food you order?” and more, I get to recognize about the different places users usually go out to eat and how it might affect them to waste food.    **Figure 2.** Food collection area at Food Court 4 observed by me  **Figure 3.** POEMS of figure 2 to help observe more about polytechnic students pertaining to food waste.  Another design thinking tool used for this project was POEMS. POEMS helps me observe users in their natural setting, helping me empathize with them. I conducted POEMS at food court 4 of SP, helping me observe polytechnic students in their natural setting when eating meals at school, outside of their homes.  As seen in figure 2, I have taken a picture of a food collection area at food court 4. I observed in the natural setting that there were many plates still filled with food such as vegetables, beans, soups, and many others. Hence, after conducting POEMS in figure 3. I was able to understand from my observation that polytechnic students waste certain types of foods, thus helping me better determine the needs of my persona.    **Figure 4.** Data Clustering of interviews    **Figure 5.** Need in pink: I need penalties to encourage me to reduce food waste  One need I have found as shown above was formed based on analyzed data points from interviews found that penalties such as those from restaurants in which they would have to pay for every 100g of food wasted encourages people to stop wasting food. Using this, I can form insights based on 3 needs.    **Figure 5.** Insight in orange: User should be aware of the amount of food others can consume  With 3 needs, I was able to form an insight as shown above. Insights gives understanding of the motivational forces behind user’s actions, thoughts, and behaviors. In the insight formed, I was able to understand that users are primarily unaware of the amount of food others can consume, thus leading to over-ordering in which food waste becomes inevitable. With this, a need statement from 3 insights can be formed, thus helping me determine the needs of my persona.    **Figure 6.** Need statement in purple: I need to be aware  of the amount of food I am ordering  With the need statement as shown above, it addresses gaps in the user’s experiences with food waste. In this instance, the user needs to be more aware of the amount of food they are ordering as to not over-order. Hence, this helps me determine the needs of my persona.    **Figure 7.** Persona : Trying Timmy  Finally, with the persona formed, trying Timmy, I integrate my understanding of polytechnic students by unifying and generalizing all the needs, behaviors, beliefs, motivations, pain points into a real character. Trying Timmy describes users as someone who believes that food waste is bad. However, he faces various challenges as shown above that hinders reducing food waste. Hence, I can help determine the needs of trying Timmy with this information.  **Word count: \_699\_** |

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