An Investigation Into the Potential Mug Types for the UBC Mugshare Program

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ABSTRACT

The Mugshare program is a UBC initiative where mugs are signed out by people for use in participating cafes across campus. Currently, the program is small, but is looking for possible mugs to use in the future, especially for the possibility of an expansion of the program. This report addresses the problem of which mug would be best for the Mugshare on campus. Though, there are many parts to the program, the focus of this report is constrained to mug types only. Also, standard retail prices for the mugs are assumed, as the program is not large enough to warrant some large wholesale shipment of mugs. The Triple Bottom Line approach was used to examine the financial, social and environmental factors of ceramic and stainless steel mugs in order to make a recommendation. The results from this analysis were that, though both mugs are similarly priced, similar in social appeal, and with comparable environmental advantages, ceramic mugs were slightly better. Then, the recommendation that can be derived from these results is that ceramic mugs are the best choice for the UBC Mugshare program.

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1.0 Introduction

Waste is one of the major problems facing the current world. Despite the fact that resources are decreasing worldwide, a staggering amount of product go to waste. To further complicate this issue, there's also many problems with how waste is managed, and these problems greatly affect the environment. The University of British Columbia has taken great initiative to become more green throughout the years, and this means they've taken several actions to reduce waste as well. One important group within UBC is the SEEDS program, which allows clients on campus to reach out to students for input and recommendations on how to deal with problems on campus, especially those related to sustainability. This report is the outcome of one such interaction, where we were given the opportunity to provide feedback to a program called Mugshare.

Recently, the Mugshare program was created to address one great source of waste: disposable cups. Every year, thousands and thousands of disposable cups are thrown away on campus. To tackle this problem, the Mugshare program offers a simple, sustainability-driven solution: sharing reusable mugs. With this program, anyone on campus, can sign up and borrow a mug for a couple of days, use it at participating cafes, and then return it. Currently the program is quite small, but with the possibility of future expansion, and in the interest of sustainability, we set out to investigate what type of mug would be the best fit for this program.

Using the Triple Bottom line approach, which takes financial, social, and environmental factors as part of an analysis, two types of mugs, ceramic and stainless steel were investigated, and the results are presented in this report. Furthermore, one specific model from each branch of mug types were selected for recommendation to the program. Representing the stainless cups is the Contigo SnapSeal Vacuum-Insulated 16 oz travel mug. As for the ceramic mugs, we chose the Smart Planet Eco Travel 12 oz mug. Both of these mugs are similarly priced, so the Triple Bottom Line analysis will be the key factor to determine which mug is the best to recommend to the Mugshare program.

The following images reflect the products mentioned above.

Figure 1: Contigo SnapSeal 16oz (Source: Amazon.ca product image)

Figure 2: Smart Planet Eco 12 oz mug (Source: Amazon.ca product image)

2.0 Financial Aspect

2.1 Stainless Steel Mug

When stainless steel production was quite a new process, stainless steel traveler's mugs were expensive. However, nowadays with advanced technology, producing stainless steel has become much cheaper than it was before. That is what aroused the idea of creating stainless steel mugs. The cost of a typical stainless steel mug depends greatly on its size. Small stainless steel mugs are close in price to ceramic mugs, but medium or large stainless steel mugs are certainly more expensive than ceramic (Charney 2011). The higher price of stainless steel mugs is definitely compensated by a better quality of the item that customer purchases. Stainless steel mugs that are double walled and dishwasher safe cost around $15. Our suggested mug, the Contigo SnapSeal 16 oz mug is priced at $12.99 dollars, following the aforementioned trend. However, there are cheaper stainless steel mugs, but are not dishwasher safe, thus can increase the maintenance cost. Since stainless steel mugs are very durable and tough, they can sustain rough handling and reduce the cost of maintenance and replacement of the mug. Stainless steel mugs are double walled by default, so no additional cost would be implemented for a good heat insulation. Most stainless steel cups come with a sliding plastic lid, these lids can be hard to clean and that certainly could add expenses to the maintenance cost. Small variations in the price exist between ceramic mugs, glass mugs, plastic mugs and stainless steel mugs . These variations on average vary between ten to fifteen dollars, depending on the manufacture. This relatively small price difference makes stainless steel mugs more attractive to potential buyers.

2.2 Ceramic Mug

The standard price for a ceramic mug is around $5-8 for single walled mugs, however, double walled ceramic mugs are usually around $15. Ceramic mugs are still cheaper than common stainless steel mugs. However, ceramic mugs come in only one size, which is 300ml, that compensates for its cheaper price (Charney 2011). Moreover, the lifetime of this product can be very long with proper care, but ceramic mugs tend to be fragile and quite brittle, which means that they may chip with ease. As a result, they would not be good for maintainability. Ceramic mugs provide good heat insulation but only when it is double walled. That is why the overall cost the double walled ceramic mugs increase a lot compared with single walled. Since the customers will be carrying the mug around (probably in their bags or backpacks), mugs could break easily, so that would increase replacement costs. The ceramic mugs are dishwasher safe and they usually come with a silicone lid, which is also dishwasher safe, and easy to clean, hence they are good for maintainability. The company called Smart Planet, which is known for its high quality, environmentally friendly products, is located in China, but readily available in North America. Due to its location, shipping costs and distance could be higher, but

considering that its 12 oz. Eco Travel Mug is priced at only $9.99, this is a great option from a financial point of view.

2.3 Conclusion

Overall, both mugs have a very similar cost, with just a difference of a few dollars. Also, some factors that should be taken into consideration are safety in dishwashing machines and quality attributes like the number of walls layers. Stainless steel is better in terms of durability, so it will be cheaper in terms of maintenance in the long term and replacement costs. On the other hand, mugs, have silicone lids that make it easier to clean than stainless steel so they are easier to clean. Then, a key decision comes down to whether it is better to pay for a more durable option, or for the cheaper, cleaner option that is a ceramic mug with a silicone lid.

3.0 Social Aspect

For analysing the social aspect of this project we took 3 things into account. First, the health of users has to be assessed. If a certain mug is difficult to clean, it may become a health problem. Next, ease of use and heat containment considerations are important to assess. If a travel mug can maintain a comfortable temperature during use, it is more likely that it will be used by students. Finally, aesthetic considerations are important for a public facing project. Users of the Mugshare may not continue to take full advantage of it if the mugs are particularly unsightly.

3.1 Stainless Steel Mug

Stainless Steel is a material used in thousands of consumer products. In most of these products, thorough analysis has taken place in order to determine the best material to use. A stainless steel travel mug, because of its frequent use, must take the material's social effects into consideration. The majority of stainless steel mugs have a plastic lid with difficult to remove moving parts. Under these parts, disease causing bacteria may start to grow if they are not thoroughly cleaned. Stainless Steel mugs mostly stay cold to the touch regardless of the temperature of the liquid inside (Sepp, 2013). Using a Mugshare, for some people, is something to be applauded and using brightly colored and unique mugs can be an incentive to use the Mugshare. Coloring a stainless steel mug requires an enamel coating. This coating can chip off and make the mug unattractive.

3.2 Ceramic Mug

Ceramics are a group of materials which have existed for millennia. From the first clay pots and earthenware utensils, ceramics have been an intrinsic part of consumer products for centuries. Ceramic travel mugs are a popular option in the modern world. In terms of cleanliness, the ceramic mugs we considered have a silicon lid which allows for the whole mug to be placed in the dishwasher. This ease of cleaning makes the ceramic mug the most sanitary. Ceramic mugs do not have as great a heat transfer ability so they may become warm in the hand. This may have an affect on user experience and must be taken into account. Colouring a ceramic mug is a simple proposition, where pigments are added to the raw material or painted overtop the fired mug, and then glazed. This glazing protects the coloring from wear and tear. The colouring of the ceramic mugs add to the presentation of the Mugshare program, which incentivise users to join and show off their eco friendly choices(Lacey, 2009).

3.3 Conclusion

The social aspects of these mugs are important to consider when deciding upon a recommendation. First, in regards to the health and cleanliness, the ceramic mug has a significant benefit. With the full dishwasher safe cup and lid, it is far and away the best for ease of cleaning. Second, for the heat dispersion, the stainless steel mug has a slight edge. Stainless steel will keep a user's hand slightly cooler. Finally, the aesthetic considerations for these mugs lends the ceramic mug the upper hand. The colours on the mug do not chip or deteriorate similar to the stainless steel mugs. After considering these three aspects, the ceramic mug has a far lower social impact.

4.0 Environmental Aspect

When analyzing the environmental aspect of these mugs, a few factors were taken into consideration. First, the matter of waste generation was examined, as this is key to the overall sustainability of the project. The next factor was the footprint of the mugs on the environment. Finally, the life cycle of the mugs was also considered. All of these aspects are tightly related, as the main consideration is to find the mug that will provide long term sustainability and minimal waste production for the program.

4.1 Stainless Steel Mug

Stainless steel cups are quite strong and long lasting. Compared to ceramic mugs, stainless steel mugs are not brittle, and can take hits and falls without breaking. Also, because they are corrosion resistant, they have a long life cycle, and won't need to be replaced often, so waste generation will be minimal (Free, 2001).

Stainless steel mugs are completely recyclable, and most stainless steel products are usually made of about 60% recycled stainless steel (British Stainless Steel Association, n.d.). Then, these mugs don't have a strong impact on the environment, as discarded mugs will not take space in a landfill, and they can be completely recycled. However, the creation of the metal itself does have significant sources that create greenhouse gasses, such as the preparation of the ore, and the electricity required for the process, so stainless steel does have a noticeable carbon footprint (International Stainless Steel Forum, 2015).

4.2 Ceramic Mug

Ceramic mugs can be used up to 2,000 times on average before breaking down, so they are very long-lasting (Carbon Clear, 2012). However, in terms of this mug's life cycle, ceramic's brittleness can be a problem for users taking the cup in their bags and breaking or chipping the mug. Then, a key factor for waste generation will be how well users take care of their mugs. Also, ceramics cannot be recycled, unlike other glass products, so after the mugs are thrown away, they will remain as waste in landfills (Waste Management, n.d.). Another important factor is that ceramic mugs have an extremely low carbon footprint. Given that ceramics are non-biodegradable materials that don't decompose, when mugs are disposed, their greenhouse gas emissions will be negligible (Carbon Clear, 2012).

4.3 Conclusion

Both types of mug have their share of advantages and caveats when considering the environment. While both cups are very durable, stainless steel is slightly better, as it doesn't break as easily, so it will generate less waste. Then, in terms of an ecological footprint, ceramic mugs are slightly better. Stainless steel does produce a considerable amount of carbon dioxide during production, regardless of their high recyclability factor, while ceramic mugs are not recyclable, but they don't have any emissions after disposal. Overall, ceramic mugs do present a better option for the environment, but users do need to take care of their mugs, so as to reduce waste from broken mugs.

5.0 Conclusion / Recommendation

Stainless steel mugs and ceramic mugs are both great options for the Mugshare program. Regardless of the one chosen, this program will provide a great, sustainable alternative to the use of disposable cups throughout the cafes across campus. However, with the Triple Bottom Line analysis conducted on both cups, we are ready to provide a recommendation for the program.

In terms of cost, the mugs themselves will be around $15 in either case. However, the long term management of the cup will be key to the maintenance and replacement costs. Both cups are very durable with proper care, but ceramic cups, due to their brittleness, could be easily broken or chipped by users, whereas stainless steel cups will last a long time regardless of care.

As for the social aspect, ceramic mugs are slightly better. While both cups can be colorful and fashionable, the easier to clean ceramic mugs provide for a better experience that will appeal to users who are concerned about cleanliness. Also, if a double walled ceramic cup, like the one we discussed in this paper, is chosen, then it will also trump the extra benefit that the standard stainless steel cup has.

With regards to the environment, ceramic is slightly better. Though stainless steel is completely recyclable and ceramic is not, stainless steel has a considerable greenhouse emission during production, while ceramic doesn't. Also, after disposal ceramic waste doesn't produce any greenhouse emissions, thus having a better carbon footprint.

Considering all these factors from the Triple Bottom Line analysis, we recommend ceramic mugs for the program. This option is the most environmentally friendly, which is important for a sustainability project such as Mugshare. Also, these mugs can have great social appeal, with colorful colors, and with the added appeal of easy to clean parts. The only caveat to this recommendation is the possibility of broken mugs that could increase costs for the program. However, we believe that if users are asked to take good care of their mugs, and mugs are not broken often, ceramic is the best type of mug for the program.

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