



UNIVERSITI  
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Cawangan Melaka

# i-JaMCSIIX 2022

International Jasin Multimedia & Computer Science Invention and Innovation Exhibition

## EXTENDED ABSTRACT BOOK

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Extended abstract

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## 4 IN 1 TUMBLER

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**Abstract** - Everyone's daily life necessitates a steady supply of water, especially in the summer. Furthermore, today's generation enjoys drinking various types of fresh juices. However, it is extremely difficult to prepare, especially when going on vacation. As a result, the 4 in 1 tumbler, a multifunctional tumbler, was created. The main goal of the 4 in 1 Tumbler is to make it easier for people to bring it with them daily and to make it a useful item when going on vacation. People can use the 4 in 1 Tumbler instead of plastic cups to reduce their use of plastic, reducing harmful waste and preserving the environment for the future.

**Keywords:** *Innovation, 4in1 Tumbler, Sustainable Environment*

### I. INTRODUCTION

Plastic and paper waste continue to devastate our planet. Plastics have become an indispensable and versatile product with a wide range of properties, chemical composition, and applications over the last six decades. Although plastic was initially thought to be harmless and inert, many years of plastic disposal in the environment have resulted in a variety of associated issues. Research on the monitoring and impacts of plastic wastes is still in its early stages, but the reports so far are concerning (Alabi et al., 2019). Over the last few decades, tons of plastic waste disposal by human activities have heavily polluted seas, oceans, and rivers, affecting the aquatic environment both directly and indirectly (Anderson et al., 2021). It is, therefore, the 4in1 Tumbler is designed to help reduce plastic and paper cup usage that would harm the environment.

### II. PROBLEM STATEMENT

Most people will go to a food outlet before going to work or during their lunch break. The drinks will be served in plastic cups with paper/plastic straws for dining-in, take away or delivery. This situation will have an impact on the entire world. Furthermore, when individual or backpacker travellers travel to a destination, they must find a product that will be useful to them. Aside from that, people nowadays don't have time to make juices because it requires specific equipment and time. How can people

help save the world while also saving their time? As a result, creating an innovative product called the 4in1 Tumbler would benefit the community and help to maintain a greener environment for a better quality of life. This is in line with seventh Sustainable Development Goals (SDG) Of the United Nations which is “Affordable and Clean Energy”.

### III. PRODUCT DESIGN

#### A. Product Figure

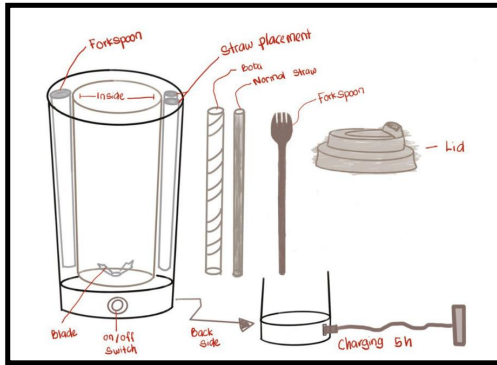


Fig. 1: 4in1 Tumbler Design

#### B. Product Uniqueness

The tumblers have two areas which are accessory space and water space. The accessories space has accessories placement to put the normal straw, boba straw and fork spoon. The water space is used to hold the water and at the same time, it has a blade on it. It is the uniqueness of that tumbler. It can also be used as a blender too. For the outside of the tumbler, the material is made from hard and durable plastic. It can avoid the tumbler from breaking easily when dropped. This tumbler is custom made. It is easy for users to create various designs according to their taste. It also allows us to create various concepts or themes on the tumbler and can even put respective names on it.

#### C. Product Usefulness

It is very convenient for everyone wherever they are. This tumbler is easy to carry and not heavy. So, it is convenient for busy people to bring it anywhere. Mostly, everyone's tastes change according to their respective moods. The tumbler will help to follow their mood. It can be used for hot water and cold water. It is because the inside of the tumbler or water space is made from stainless steel. So, it is resistant to heat and cold. Then, to use it, it does not need to be plugged into the plug directly as it uses a battery. Still, we just need to make sure the battery is charged and it can be used anytime and anywhere. The accessories and charger will be provided along with the tumbler. So, it is not just convenient to use but it has a beautiful design and is suitable for everyone. This tumbler is using the best material to make sure it can be used many times. It is one way to prevent environmental pollution from using non-decomposing plastic cups.

#### IV. MATERIAL

The 4in1 Tumbler is made of two different materials: plastic and stainless steel. The plastic component will be made of Bisphenol A (BPA) free Styrene-Acrylonitrile (SAN) plastic, which is far superior to Polycarbonate (PC) in terms of chemical resistance. The most popular material was plastic, and stainless steel was used on the inside to keep the tumbler's temperature stable. Inside the tumbler are a 3-mini blade and a battery and a Universal Serial Bus (USB) port. Stainless steel is used for the utensils.

#### V. METHOD

The methods that we use is utilizing existing tumbler in the market with the size of 700ml that have a plastic outer layer and 500ml that have a stainless-steel material interior and adding innovations to it with space to store cutleries, electronic parts for Universal Serial Bus (USB) Type-C charging ports at the bottom of the tumbler and rechargeable lithium batteries (3.6V, 1200mAh). Besides that, 3 mini blades will be placed at the bottom of the tumbler. Electric components will be soldered according to our design. In addition, voltage and power testing will be conducted to ensure its operationality and safety. Moreover, a product awareness and readiness survey were also carried out via Google Form to provide us with feedback which includes demographic profiles, respondents' awareness of our product, the usability and the product features. The methods of data collecting from the survey are being done on a scale of 1 to 6, whereby, (1= Strongly Disagree to 6 = Strongly Agree). The statistics of collected data were represented in a pie chart for our summary.

#### VI. UNIQUENESS

The tumblers have two areas which are accessory space and water space. The accessories space has accessories placement to put the normal straw, boba straw and fork spoon. The water space is used to hold the water and at the same time, it has a blade on it. It is the uniqueness of that tumbler. It can also be used as a blender too. For the outside of the tumbler, the material is made from hard and durable plastic. It can avoid the tumbler from breaking easily when dropped. This tumbler is custom made and the plastic material used is also translucent. It is easy for users to create various designs according to their taste. It also allows us to create various concepts or themes on the tumbler and can even put respective names on it.

#### VII. USEFULNESS

It is very convenient for everyone wherever they are. This tumbler is easy to carry and not heavy. So, it is convenient for busy people to bring it anywhere. Mostly, everyone's tastes change according to their respective moods. The tumbler will help to follow their mood. It can be used for hot water and cold water. It is because the inside of the tumbler or water space is made from stainless steel. So, it is resistant to heat and cold. Then, to use it, it does not need to be plugged into the plug directly as it uses a battery. Still, we just need to make sure the battery is charged and it can be used anytime and anywhere. The accessories and charger will be provided along with the tumbler. So, it is not just convenient to use but it has a beautiful design and is suitable for everyone. This tumbler is using the best material to make sure it can be used many times. It is one way to prevent environmental pollution from using non-decomposing plastic cups.

#### VIII. RESULTS AND FINDINGS

##### A. *Demographic Profile*

The variables in our demographic profiles are gender, race, marital status, age range, level of education, and employment status of respondents. 106 responses were recorded in our survey by the potential target market. The findings revealed that 71.7% of females and 28.3% of males have responded, with 53.8% aged 18 to 25 years followed by 15.1% aged 25-30 and 25.5.4% aged 30 and above, and 5.7% aged under 18. In addition, based on occupations, 47.2% were students followed by 36.8% employed and 9.4% others.

### *B. Respondent Awareness*

Regarding the necessity of bringing a tumbler daily, 86.5% had agreed and 13.5% of people disagreed with the statement. Next, 99.1% of respondents agreed that a multi-purpose tumbler should be created and developed. In addition, 87.7% agreed that a tumbler which can function as a blender with provided cutlery is better for everyday use while 12.3% disagreed. Moreover, 88.7% of respondents agree that a multi-purpose tumbler is suitable for all generations while a significant number which is 11.3% disagreed. Besides that, 99.1% of the respondents think that a multi-purpose tumbler is good to use and 84.9% agreed that a tumbler is convenient to bring. A large number of respondents 88.7% prefer a 4 in 1 tumbler to a simple tumbler. 96.2% of the respondents agreed that a multipurpose tumbler is required while travelling and all of the respondents agreed that a 4 in 1 tumbler is useful when travelling.

### *C. The Usability of 4 in 1 Tumbler*

For the usability of the product, 52.8% of the respondents agreed that a 4 in 1 tumbler will be useful for travellers. Next, 77.3% also agreed that a combination of a tumbler and a blender in one product is convenient to use. 85.3% of the respondents agreed that carrying capacity and space can be saved due to the access space to storage for spoons and straws in the 4 in 1 tumbler. Furthermore, 57.5% agreed that the tumbler will not be prone to damage due to its anti-shock material. Lastly, 63.2% have agreed that beverages will stay at an optimum temperature by using the 4 in 1 tumbler.

### *D. The features of 4 in 1 Tumbler*

Based on the survey, 50.9% of the respondents agreed that a 4 in 1 tumbler must be solidly built and shock resists while 38.7% disagreed. Next, 60.5% of the respondents agreed that the 4 in 1 tumbler must be able to withstand high and low temperatures. Besides that, when asked about the tumbler's feature which can help save carrying capacity and space, 85.3% of the respondents have agreed with the statement. Moreover, 50.9% of the respondents agreed that a rechargeable 4 in 1 tumbler which has long-lasting batteries will ease them during travel. Lastly, 52.8% have agreed that owning a tumbler which can be customized to their liking can enhance their mood while travelling.

## IX. CONCLUSION

In a nutshell, the world is getting more polluted day by day. That is why we need to try our best or contribute the least by reducing the use of plastics in our daily lives. The innovation of our product which is the 4 in 1 Tumbler can help the world by reducing the use of plastics. Furthermore, our product can help customers to save time by spending too much time preparing their meals or beverages. The blade components inside our tumbler help customers to blend either their protein shake without actually using the actual big blender that is used for cooking normally. It is also convenient to bring anyway, especially for the travellers who did not want to bring items that can burden them and consume space. We believe that our product innovation can help customers out there to reduce spending time too much on unnecessary things as well as help to reduce the use of plastic.

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