

# Hwa Chong Institution

## Project Work

### Category 3 Inventions Log Book

Title of Project: Bags Up
Group Name: 3-39
Group Members:  1) Ho Keng Hin  2) Joei Mah Zhi Wen  3) Teo Chuan Kai  4) Xu Han Ming

## 1. Problem Finding

(The beginning...)

Identify a problem you would like to solve. You may want to brainstorm for problems using different approaches eg thematic, survey or general brainstorming etc.

**1 A Document a list of problems you have identified. Your documentation should show clearly how your group came up with the problems.**

- 1) When chairs are stacked high up, shorter people would have problems unstacking the chairs on top.
- 2) When people carry their bag around they would not want to put their bag on the ground but they are unable to hang their bag on their chair.
- 3) At night, bikers usually only have lights on the bike but not on themselves, putting the bikers at risk when they get off their bike as most people would only notice the lights of the bicycle instead of the biker themselves.
- 4) When books and bags are not organised, they tend to get messy and lost, which would be a problem when a student lost his homework on the day he needs to hand it up or when a student loses his tuition bag with all the tuition worksheets when he is about to go for tuition. There is also the case of people not having a place to write down important events(chosen problem)

**1 B You should have selected a problem based on some considerations. Identify and justify these considerations.**

- 1) Is the invention easy to make? (Feasibility)
- 2) How much would this impact the targeted audience?
- 3) How much is it really better than current known solutions?
- 4) Is the invention cost-effective?

**1 C List some problems your group would like to solve. List also the considerations for selection of problem in the evaluation grid below. Score the considerations, against the problems, with points 1 (least significant) to 4 (most significant). Sum up the total points for each problem. Identify that problem you would like to solve.**

## Problem Evaluation Grid

\*add more columns and rows where necessary

Considerations for Selection	Problems			
	Unstacking chairs	Unable to hang bags on chairs	Visibility of biker when near the bike but not on it	People's bags and books get messy and lost easily when not organised
Feasibility	6/10	9/10	7/10	8/10
Effectiveness	7/10	7/10	8/10	9/10
Expenses	4/10	5/10	3/10	4/10
Comparison to current solutions	9/10	6/10	1/10	8/10
Total Score	26/40	27/40	19/40	29/40

## 2. Define the Problem

(This is one...)

Now that the problem has been identified. It is important to gather information on the extent of the problem and/or evaluate the usefulness of existing solutions based on *some criteria*. You may need to conduct surveys and research on existing solutions.

### **2 A Extent of problem (Research and discuss the problem and write down the problem statement)**

There are three parts to this problem:

Firstly, in a person's daily life, they may have a lot of things they need to organise and place properly, such that they do not lose them or get confused. They have to find a place to put them and organise them. Few solutions of this currently exist.

Secondly, bags. Bags are easily lost and tangled when they are placed together on a table, chair or on the floor. Moreover, when the bags are placed on chairs or tables, they have a tendency of dropping, which would fold the papers inside the bag or cause the contents of the bag to drop out. If the bags are placed on the floor, there is a chance of people tripping over the bag.

Thirdly, when people need to write down important events, there is a need to have a notebook or a piece of paper. However, there are people who do not have notebooks and writing important events on a piece of paper requires a place for it to be stuck on to be seen. Using a whiteboard is an option, but bigger whiteboards usually have to be nailed and hence are not portable.

## **2 B Compare and contrast the existing or similar solutions.**

1. Door Organisers. It is a canvas with pockets which is used to store different things such as shoes and is hung on doors. However, these are often unable to hold bags and could not function as a whiteboard.
2. Bag hangers. There are many types of bag hangers. While some bag hangers have the ability to hang other things such as clothes, none of them can organise books.
3. Whiteboards. There are many types of whiteboards with different sizes, but the bigger ones are bulky and not portable. It is also only a part of what we are going to achieve in our invention.

## **3. Your BIG IDEA**

(Developing the idea....)

Write down your proposed invention and why you want to do it. State also how you think your proposed invention is better.

### **3 A Describe your proposed invention.**

We want to construct an organiser hung on doors that can be used to store and sort out books and worksheets. We can also include hooks that can allow bags to be hung on them. There will be 3 large “pockets” to store the books and smaller items, and at the sides, strong hooks to hang the bags. There would also be a writing board non the back of the canvas, which acts like a whiteboard that could be used to write down important events and could be erased afterwards. The front parts could also be written on with a marker to label the pockets.

### **3 B Explain the purpose of your proposed invention and the potential benefits to users.**

The purpose of our invention would be to allow the user to sort out the items in their daily lives through the use of our door organiser. Students, parents and teachers can benefit from it. They can place their books and files in different pockets, and hang their bags. The organiser can be placed on the doors of classrooms, for both teachers and students to organise their materials or bags when they want to. The organiser can be placed on doors of each room at home, allowing bags and books in the room to be more organised.

### **3 C In what ways would your proposed invention be different and/or better than existing solutions, if any?**

So far, there are no organisers which have the ability to hang bags in the market, and no bag hangers with organisers. There is also no whiteboards in any organisers and bag hangers. Our invention acts as a mixture of an organiser, whiteboard and bag hanger.

### **3 D What are some problems you expect in the course of your proposed invention?**

- 1) Sewing the pockets to the canvas
- 2) Deciding on the size of the canvas

3) Finding a material that has a side which could be used as a whiteboard

### **3 E What and when are the major milestones (project timeline) in your invention?**

T2W2 -Proposal evaluation

T2W3-9 – Planning of prototype

June Holidays - Creation of prototype

T3W1- Mid-term evaluation and change of idea

T3W2-3- Finalisation of the overall structure of the prototype

T3W4-5- Construction of prototype and testing

T3W6-Finishing of written report and project's day finals slides

## **4. Construction Process**

(This first... then that...)

You are now onto the fabrication of your prototype/ product. You need to select material and understand how to put them together so that your prototype/ product can perform its function.

### **4 A Explain how and why the materials were chosen for the prototype/ product of your invention.**

1) Heavy Duty Nylon PVC Canvas Tarpaulin

Heavy Duty Nylon PVC Canvas Tarpaulin is a flexible material, allowing it to be rolled up and brought to a different place easily. It is also rather durable and could be used like a whiteboard.

2) Outdoor ACC (metal hooks)

It is strong enough to carry medium sized bags which weigh around 3kg, while securing the bag as it hooks the bag holders up.

### **4 B Explore these considerations that may guide the construction of your prototype/ product.**

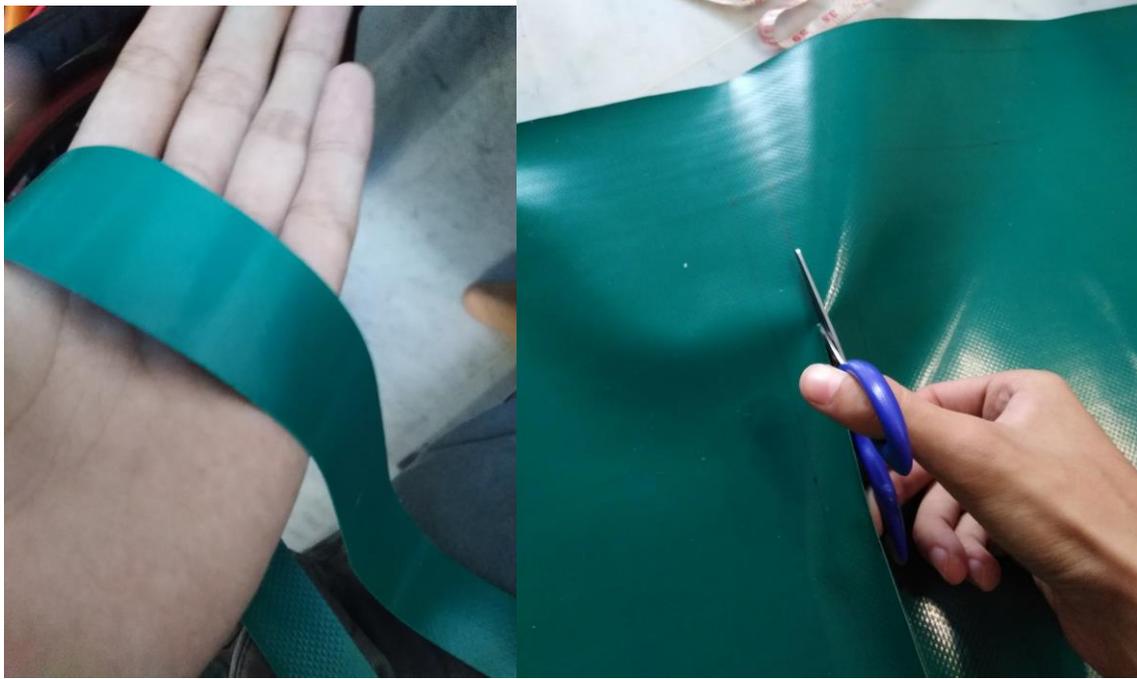
We aim to create an invention that

- Able to hang bags
- Able to hang on doors
- Able to organise books
- Portable
- Can also function as a “whiteboard” on one side

**4 C Document the prototype/ product development stages. You may use drawings, photographs or videos.**



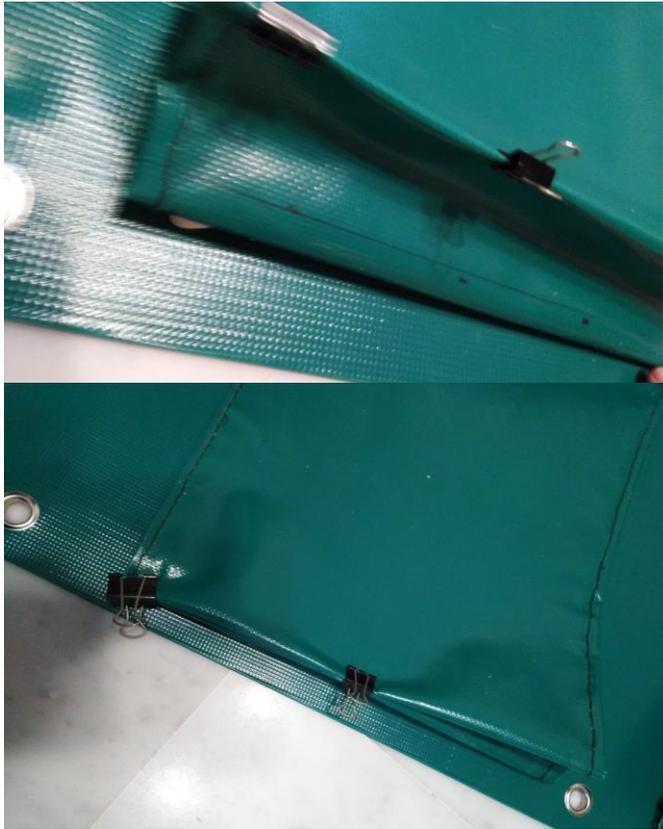
Firstly, we searched for a material that is waterproof ,flexible, strong, durable and can be used like a whiteboard. At Lian Heng Canvas Trading PTE. LTD., we found a material, canvas tarpaulin(specifically Nylon PVC tarpaulin), which is water resistant, scratch resistant, flexible. After some testing, we found the canvas has a side which could be written on using a marker and erased after a week. We bought a canvas tarpaulin 1m x 1.8m in size and ordered a canvas tarpaulin with metal rings installed on it. We also ordered metal hooks and Outdoor ACC(a type of metal hook)for the canvas to be hooked on doors and for hanging bags by the side respectively.



After getting the canvas tarpaulin, we cut off a small strip of the canvas for testing purposes. Based on the measurements of each of the pockets, we made a pocket out of newspaper as reference before drawing the dimensions of each of the pockets on the canvas with a red pen and ruler and cutting it.



Then, we needed to sew the top and bottom parts of the pocket, which further strengthens the pockets and also serves as a warm-up for sewing. We learnt how to sew the canvas from our parents. However, the canvas constantly folds back in place when it is not held, affecting the sewing process. As such, we needed a way to temporarily hold the top and bottom parts of the pocket. Firstly, we checked if ironing the canvas strip, and found out that it got discoloured but barely secured in place. Secondly, we tried ironing the canvas with a cloth above it to prevent direct contact. While it works, it is very time-consuming and we tried a new method. Thirdly, we tried using UHU heavy-duty adhesive. It left a white stain on the canvas and made it difficult to sew as shown in the first picture. Lastly, we used UHU patafix, which is blu-tack. We first blu-tacked the parts that need to be folded, then we drew a red line for sewing straight, and then remove the blu-tack as we sew. Even so, the sewing got slanted due to our lack of experience in sewing. Poking through 2 layers of canvas with a needle is a tough process.



Lastly, we needed to sew the pockets on the canvas with metal rings. The first picture shows the side of the pocket being sewn on the main canvas. The second picture shows the other side of the pocket. Blu-tacks are used on both sides of the pocket to ensure the pocket stays in place and does not slant. A red line is drawn to show the area that needs to be sewn. Sewing this required adult assistance for poking through 6 layers of canvas at the bottom corners of the pockets. This was the hardest part of the project.



**The Final Product**

## 5. Modification and Evaluation

(Oops...)

Upon the completion of your prototype/ product, you would need to see if it is working the way you want it to work. Check if your product has met the identified purpose and the user's need; and implement necessary modifications and improvements. This process may take several rounds.

**5 A Write down your prototype/ product test criteria and check against it if it works. Identify areas of weakness for modification. Indicate the test iteration and date of test.**

Test Iteration:	Tick			Remarks
Test Date: 24/7/2019	Pass	Fail	Potential Failure	
Able to hang bags?	✓			4 medium-sized bags could be placed on the prototype
Able to hold books and worksheets?	✓			Every pocket is able hold books up to 3kg in weight
Portable?	✓			The prototype is foldable
Able to hang on doors?	✓			-
Able to be used as a writing board for markers?	✓			It needs to be erased with a wet tissue

\*Add more rows for more criteria

\*\* Repeat table for next test iteration

## 6. References

(Thanks...)

Read <http://www.bibme.org/citation-guide/apa/> on how to cite references.

**6 A Cite the references you have used for your project work. Your source of reference should come from different types (eg books, magazine, websites, journal articles, interview, photographs, product brochure, reviews etc.)**

Tarpaulin- Wikipedia (2019, July 9)Retrieved from <https://en.wikipedia.org/wiki/Tarpaulin>

Grey Over Door Organiser: Hanging Door Storage Bag on OnBuy (n.d.) –Retrieved from <https://www.onbuy.com/gb/storage-boxes/grey-over-door-organiser-hanging-door-storage-bag~c7561~p1259595/>