Packaging Solution - CoffeeMush - Team 1

It is important to think about the packaging for CoffeeMush to contribute to the efficiency and sustainability of the product. The aim is to make a multipurpose packaging solution so that the package can be used after the product is packaged. In this paragraph, three different solutions will be addressed to get to the best solution for CoffeeMush.

The first packaging solution idea is using the packaging box as an extra room for growing mushrooms. Once mushrooms are grown and collected it does not mean all the coffee ground biomass is consumed, more mushrooms grow even after collecting them. That is why the extra room will be used to use the maximum amount of biomass the coffee ground has as shown in figure 50.

Figure 50: Packaging solution 1 draft

For this solution, a small change in the boxes is needed. As figure 51 shows, the small boxes can have a mechanism in which they discover their holes once they get out of one of the two first rooms, so that they discover their holes for the last room. This way, mushrooms are allowed to grow through the holes without causing any trouble inside the dark and light rooms.

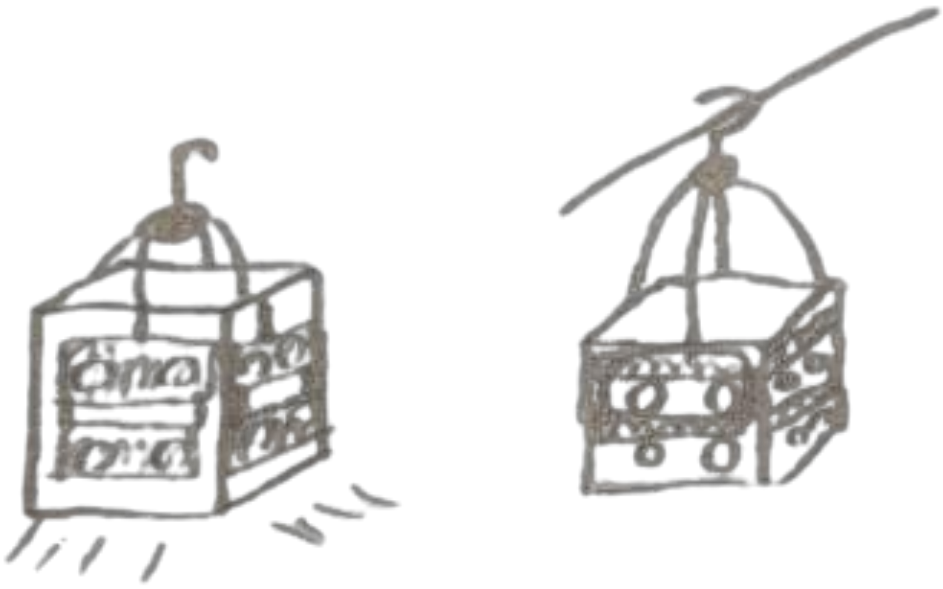

Figure 51: Packaging solution 1 drawing

A second packaging solution could be to use the packaging as material for the boxes in which the mushrooms will be grown in the composter. The package could be made from plastic, which the consumer can then fold into boxes for the mushroom growing. The package should show the folding- and tear lines. An instruction should be added, either separately or in the app or on the packaging as well. The material of the boxes cannot be cardboard but should contain some plastic, because it gets wet when the mushrooms grow. The draft and drawing for this idea are shown below in Figure 52 and Figure 53.

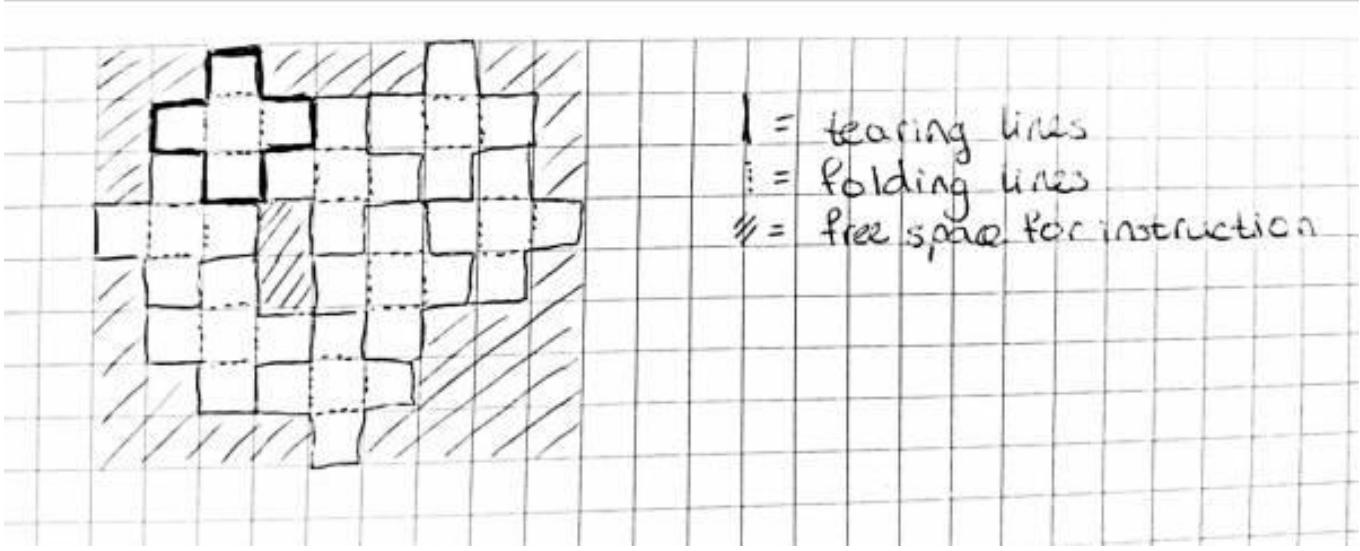

Figure 52: Packaging solution 2 draft

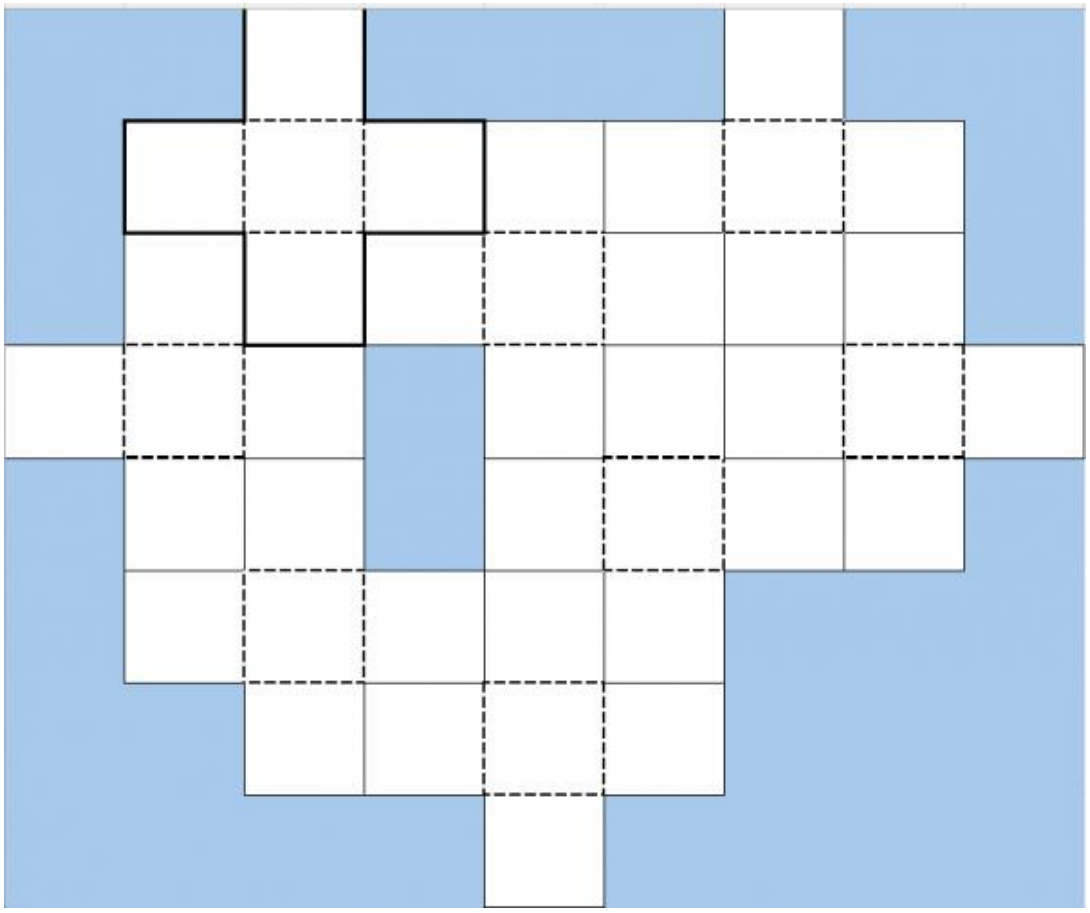

Figure 53: Packaging solution 2 drawing

Third idea:

The main idea for this packaging solution would be to have as a second life the capacity to be able to transport coffee or mushrooms from point A to point B, this avoiding the use of plastic bags which are harmful to the environment. This packaging would be waterproof and would prevent the coffee from escaping. Once you have opened it you will have access to two straps to allow the most functional transport. The draft and drawing for this idea are shown below in Figure 54.

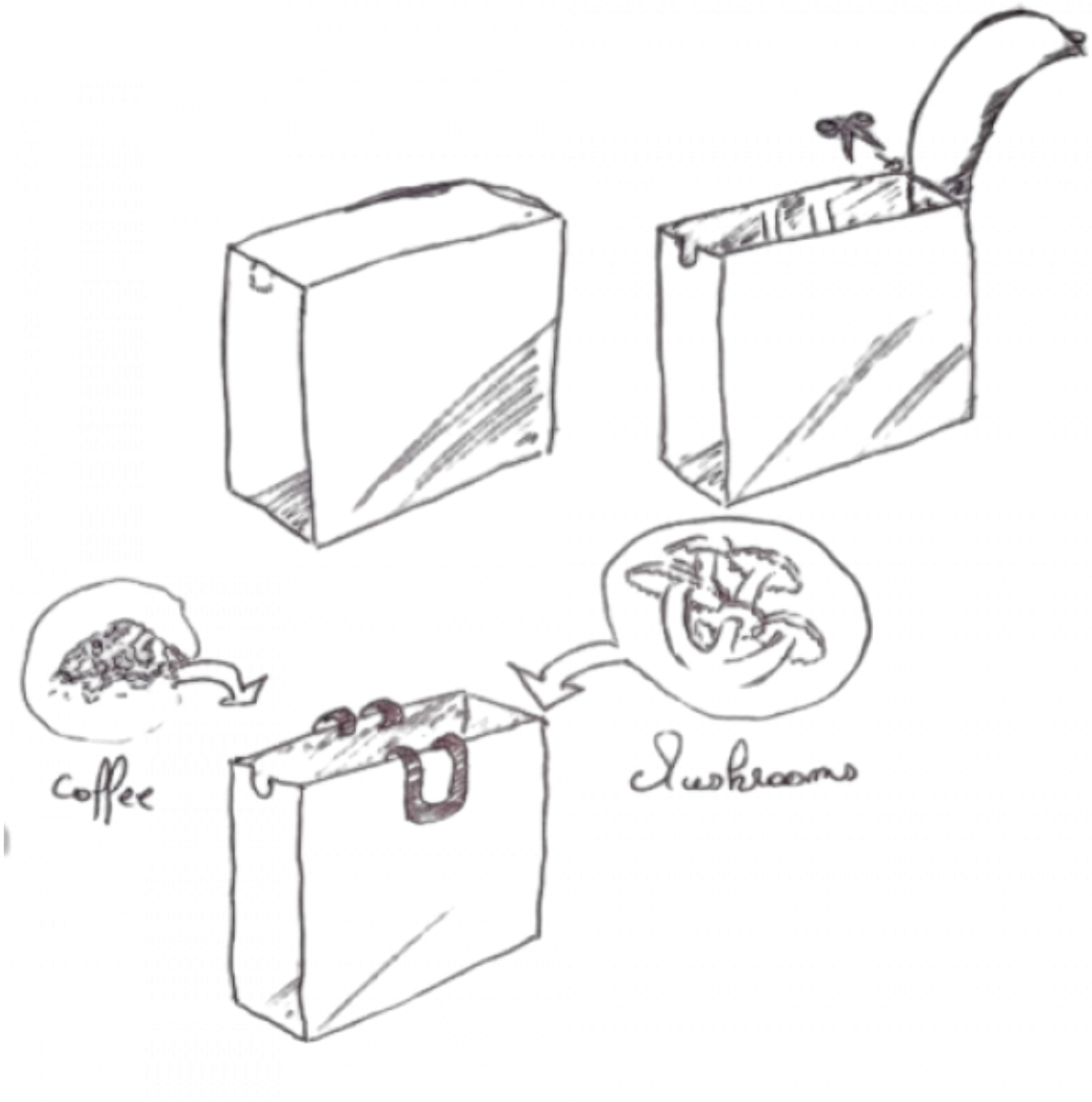

Figure 54: Packaging solution 3 drawing

Final solution

The three options were compared and analyzed, as can be seen in the Table 29. Scores 1 to 5 are given to the necessity, feasibility and how easy it is to realize for the customer. The Necessity of the product refers to how the function of the package is really useful for the customer. The necessity of number three is highest, a way to transport coffee waste and mushrooms does not come with the product. The necessity of number 2 is average. It is a more sustainable way for the boxes of CoffeeMush, but in the

design there are already standard boxes. The necessity of number 1 is low, because it does not add much to the design.

The Feasibility of the product refers to how realistic the design is and how it will work in real life. The lowest score is given to the second design, because this design contains a lot of tearing and bending lines. These are quite fragile and might break during transportation. Number one has fewer of these fragile lines, but still some. Number three has the least: only a few tearing lines in the middle.

The last factor is how easy the packaging solution is to realize for the customer. This is the highest for the last one, only a couple of tears have to be made and the boxes are easily made. The first two packaging solutions contain more steps to realize, but should still be doable for everyone.

Table 29: Packaging solution

Solution	Necessity	Feasibility	Easy for customer	Total score
1	1	2	4	6
2	3	1	3	7
3	4	4	5	13

The material of the packaging will be mycelium. This decision was made because of several factors. The first one is that this material is really sustainable. It is made of biological product, which means it is easily made, never out of resource and well compostable. Besides, it is a good packaging material because it is water resistant, flame resistant and chemical free [Mushroom pagaging by Ecovative, 2023]. The material can be made into some form of leather, thin paper or a kind of foam. For this package it is most useful to make the box out of the foam, it protects the CoffeeMush the best. The two strips in the middle should be bendable and thus made out of the 'leather' of mycelium.

For the customer, a step-by-step-guide is made on the package: 1. Delivery of CoffeeMush in package 2. Tear at the tearing lines The box is made out of two big boxes and two long strips. The strips can be torn in two pieces. 3. Attach handles to bags The strips can be attached to the box by connecting the strips with holes to the knobs on the box. This creates a handle. 4. Bags are ready to transport mushrooms and/or coffee waste!

The design is sketched below 55:

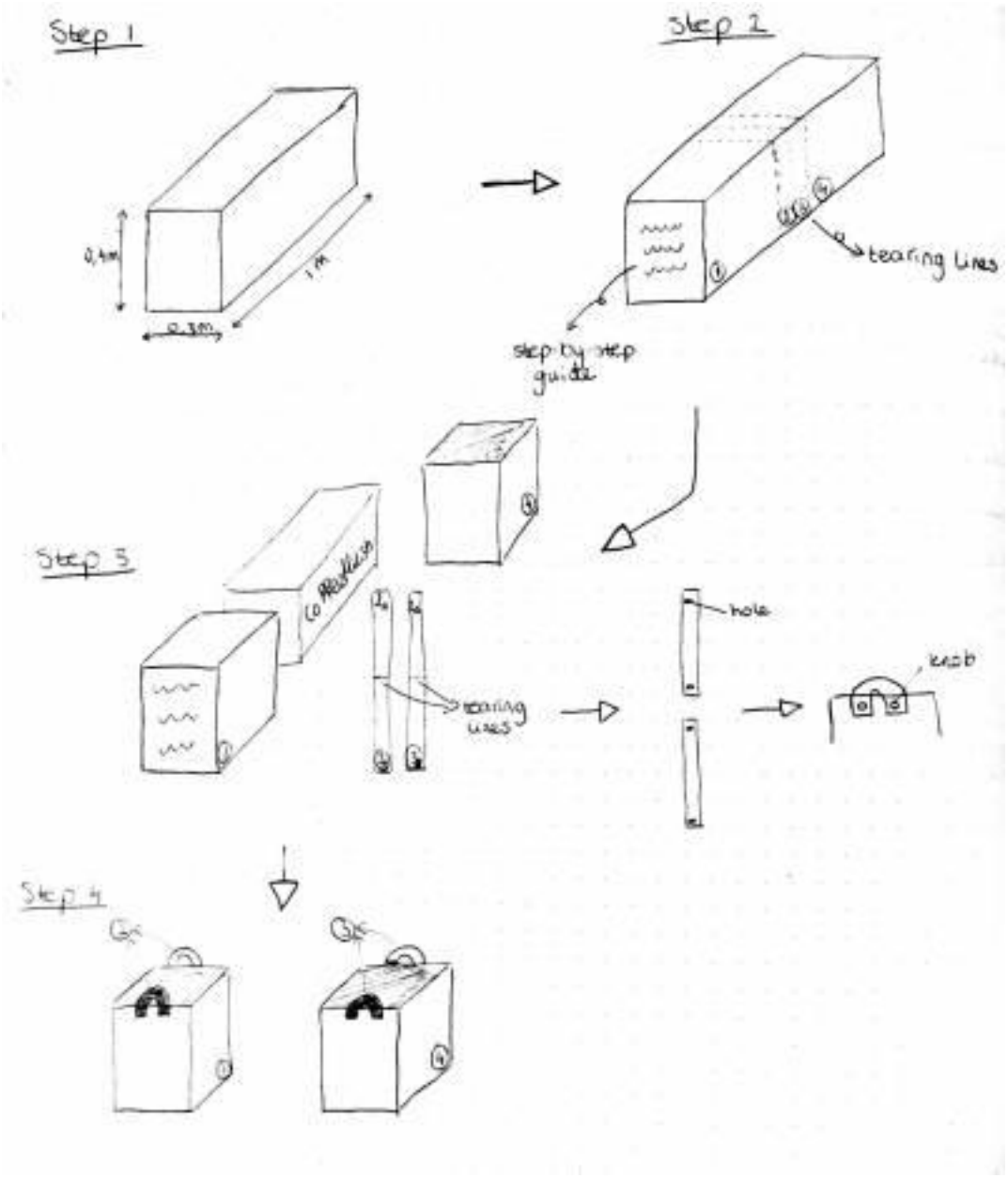

Figure 55: Packaging step-by-step design

This step-by-step guide is printed on the package of CoffeeMush. The logo and slogan will also be printed on the outside of the package. This way they will also be visible on the boxes that are made to transport coffee waste and mushrooms.

A second version of the packaging solution was made to solve the problem of getting the device in the package or closing it around the device. Furhtermore it should be more easy for the customer to get the device out and to build the transportation boxes for coffee and mushrooms out of the packaging. The solution can be seen in Figure 56.

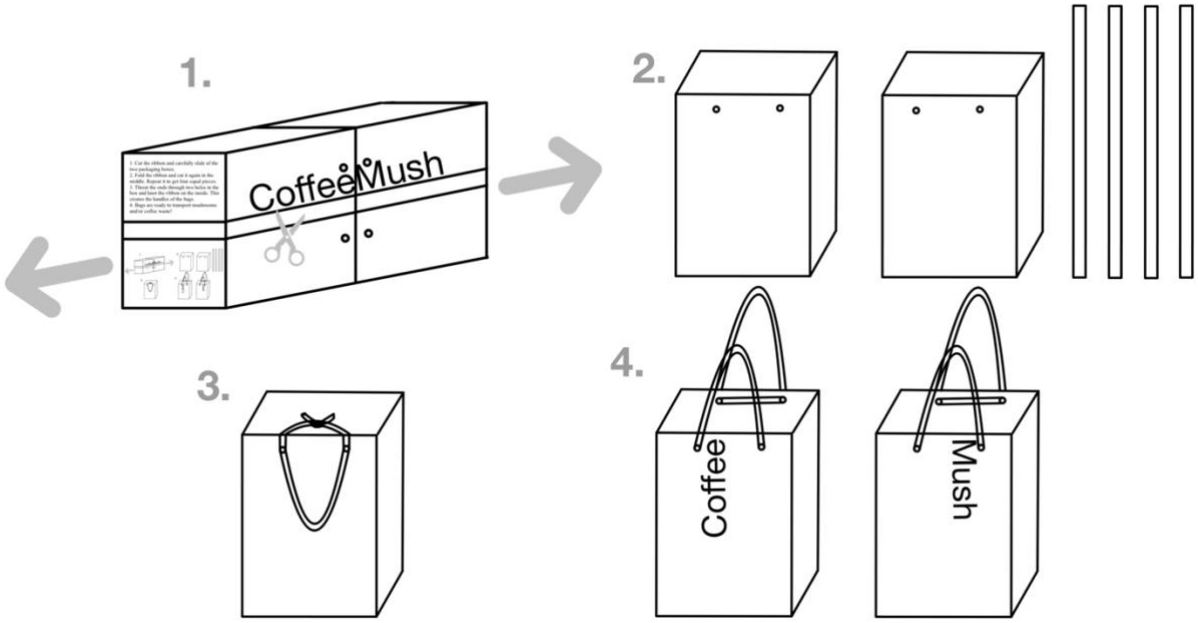

Figure 56: Improved Packaging step-by-step design

Most aspects from the first version of the packaging solution, like the materials and the printings are the same. The difference according to the other version is that there are no tearing lines and that the mycelium ribbon is used in a different way. There are to similar boxes made out of mycelium foam that are put from each side over the device to protect it. The foam is approximately 1 cm thick and made by growing the mycelium in a mole. To hold the two boxes in position and to have a material for the handles, there will be the ribbon, which is made out of the 'leather' of mycelium, fastened once around the entire packaging. If the customer wants to use one box for coffee grounds and one for mushrooms the name CoffeeMush will devide, that one box has written Coffee on it and the other Mush. That way the customer will not mix up the boxes. To guarantee the water resistance of the packaging, the holes for the handles could be closed with a sticker of the logo.

The step-by-step-guide for the customer is again visible on the outside of the packaging and shown in text and also pictograms.

1. Cut the ribbon and carefully slide of the two packaging boxes.

2. Fold the ribbon and cut it again in the middle. Repeat it to get four equal pieces.

3. Threat the ends through two holes in the box and knot the ribbon on the inside. This creates the handles of the bags.

4. Bags are ready to transport mushrooms and/or coffee grounds!