Proposed concept

Morphe comes from the ancient Greek epistemology which had a meaning of form and outward appearance. We have chosen this name as it directly links with our purpose of shifting a problem and forming something new out of the contribution of plastic bottles. We believe it appropriately symbolizes the shift we aim to have in tourists' minds by creating awareness of the footprint they have on their travel destinations.

Detailed description

Nowadays, there has been an increase in awareness of the negative implications plastic has over the environment. However, throughout our analysis we realized that despite this increase in awareness there was a persisting issue regarding plastic bottles. Therefore, we decided to focus in a segment of the population that is constantly growing, travelers. In 2017, tourism had a total contribution of 8.27 trillion U.S. dollars to the global economy, directly contributing with 2.57 trillion.[1] Paris is one of the most popular destinations that welcomes tourists from all over the world, which is why we decided to develop our concept thinking on the needs of this particular environment. However, it is important to mention that in order to have an impactful concept we have taken into consideration several universal factors that allows *Morphe* to be adaptable to different cities and environments regardless of culture and customs.

Consequently, Morphe is at first glance like any other vending machine. However, it has specific attributes that were designed with plastic re-use in mind. It has a main display that mimics a common vending machine, this was purposely developed in order to avoid any alienation and diminish understanding barriers, making it a more intuitive interaction between the user and the machine.

It is important to mention that the plastic bottle plays a key role in the process, which is why we have decided to place it in the center of the machine. Additionally, this serves the

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[1] "International Tourist Arrivals Worldwide by Region 2017." *Statista Market Forecast*, Statista, 2017, www.statista.com/statistics/186743/international-tourist-arrivals-worldwide-by-region-since-2005/.

purpose of allowing the plastic bottle to go through the mini processor, which will deconstruct the plastic into smaller pieces in order to be able to be used by the 3D printer as a cartridge. Moreover, we have decided to design a see-through panel that allows the user to have a direct view of how the 3D printer interacts with the plastic and transforms it into something new. We consider this is one of the key aspects of our design, as its value lies in creating another layer of engagement through entertainment, we wanted to not only create a sustainable concept but to also consider what the user experience would be like.

In the right panels we have two main buttons that serve as the decision makers and help activate the machine with a different amount of cartridge needed. We decided to have two options in order to increase the productivity of the machine; a useful item specifically chosen in regard to the particular needs of the travelers in that place and a collectable stamp that has a symbol of the city it lies on. For our design render, we have chosen to have raincoats as the useful item that can be made out of plastic and of high practicality for those travelling in Paris during its frequent rainy days. We have also designed a themed stamp of Paris, which we can later modify by including different local artists designs and ideas. The decision of this two-option machine came from a secondary market research, in which we found that tourists are commonly attracted towards unexpected experiences, such as the one we aim to provide, but also because in essence travelers were found to be more engaged when they were presented with local tokens that are representative of the place they are visiting. For the design and transformation of the stamp, the required plastic is much lower than that of a raincoat, which allows us to maximize the input and store the plastic remaining for the next user that picks to acquire a raincoat. This maximization of input also serves our concept as a solution to a main challenge we encountered: when travelling, people are not normally carrying around more than two bottles of plastic. Therefore, this average amount of input was unable to fill the cartridge for the 3D printer and consequently the machine would not be of much interest if the user does not have more than one bottle to introduce into the machine. By proposing a stamp as a solution, we can engage a larger number of users and create an impactful experience while also giving them back a meaningful token from their trip.

Scope

The solution we have proposed through our concept Morphe is not limited by its output, as the core essence lies in the experience and engagement created through our machine in which we aim to generate awareness through memorable interactions.

Our particular approach to such an important crisis as the increasing plastic pollution, provides us with an authentic opportunity to create a sustainable and feasible concept that can be easily adaptable to different environments regardless of culture or customs. Its originality derives from the strategic method in which this concept was developed, as we decided to focus in a growing segment of the world's population, travelers, but at a reasonable scale and with a viable system of inputs and outputs that follow current available technologies.

It is important to mention, that in our creative process we took into consideration several secondary research in which we realized that plastic has been a part of retail products for at least five years. An example is a collaboration Adidas had with the organization Oceans, who are known for their work in the threats against our oceans, together, they developed Adidas Ultra Boost Parley sneakers that were made with recyclable materials, mainly plastic. Patagonia is also a well know brand that has been creating retail products with a recycled polyester out of plastic soda bottles. Through this analysis, we realized that the source of inputs for frequently used products could be a solution to a worlds crisis if we were to repurpose its materials. We took this as our inspiration in the development of our concept.

Finally, we also contrasted and compared our project to a similar one made in Italy by college students Marco Tomasello, Daniele Caputo, Vincenzo Virruso, Vittorio Maggiore, and Toni Taormin. Their invention called MyProAction vending machine consists of a similar incorporation of a 3D printer to a vending machine that turns plastic bottles into smartphone cases. It was firstly launched for a competition in 2015, however, the machine did not address some challenges we have solved through our frameworks, the most concerning one was the barrier that occurred due to the 3D printing speed. During our research, we realized that the printing speed is dependent on the line width of the object being printed. Consequently, technology in 2015 was not as advanced as the latest 3D

printers, which is why we have decided to have an extruded profile following a form of an oblong in order to strengthen the final execution, as well as fasten its process. Additionally, by having our 3D printer programmed to a 1.20mm nozzle will allow us to have a greater output and flow than those of other sizes.

Frameworks

In order to consider our concept feasibility and to obtain a deeper understanding of the functionality, we decided to focus on a frequently used framework that allows for the analysis of interdependent variables that affect its adaptability by the market and user. Firstly, the framework is called "Rogers Five Factors" and was created by Everett Rogers, who firstly introduced it in his first edition of "Diffusion of Innovations" in 1962 at Ohio State University. The framework refers to five product-based factors that largely influence the rate of adaptation of a new product. During our analysis we followed conventional rules and parameters of a new product being launched into the market, despite our own specific non-profitable concept, in order to obtain concrete results.

Relative advantage— Through comparison of other products in contrast to ours, we have realized that Morphe poses as significantly superior as it considers the user experiences at its core and answers to an intuitive design that creates more engagement and provides a reward for interacting with the product.

Compatibility— As mentioned before, during the design process we considered several factors in order to be able to place Morphe in a variety of locations without the need modifying its core activities. This allowed us to be compatible with different users regardless of their background or cultural attributes. We also took into consideration a minimalist approach towards the commands in order for the user journey to be simplified and efficient.

Complexity— By using basic commands similar to those of a vending machine that is commonly used in different parts of the world, we lowered the complexity barrier and allowed users to interact easily with the machine without previous technological

knowledge. The only requirement will be to be able to read the instructions, which can be adapted to the language of destination, and be able to provide with the input: plastic bottles.

Trialability— This is a challenging category, as our machine requires energy inputs, which would limit its trialability as well as its accessibility. However, by placing the machine in strategic touristic locations it will serve the core purpose of creating awareness and be reachable to a reasonable scale of users.

Observability— This category is closely linked to trialability, and while we consider that observability barriers can be a problem, we consider that through our key partners we could obtain with the use of PR and under the line promotion a larger visibility of use and therefore increase interest and appeal of the machine to a larger audience.

In conclusion, a well-executed strategic promotion plan will allow us to tackle the challenges our machine may have in relation to trialability and observability. However, the factors considered in the development of the Morphe concept are closely related to its target audience and its needs, which can increase the probability of achieving our main objectives through the implementation.

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