

# **Sustainability Innovation**

## **A Replacement Plan For One-off Plastic Package**

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# Summary

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Nowadays, most people think it's normal to pack instant food with one-off plastic bags, yet the plastic discharged from package has caused great burden to our environment and ecosystem. Owing to the characteristic of plastic, it is easily mistaken by animals as food, resulting in serious problems in animal health and welfare. And what's worse, these pollutants require huge amounts of time to degrade and may constantly bring negative impacts to our beautiful planet for thousands of years. Therefore, it's a great urgent for us to find a practical replacement for plastic package.

In this project, we resort to greaseproof paper as the package material. Making the most use of the design thinking model, we bring out a material-saving, environmental-friendly and affordable design through five steps, including Emphasize, Define, Ideate, Prototype, and Test. Owing to the price difference between paper and plastic, customers and sellers may still favor plastic bags over greaseproof paper package. To solve this problem, we provide specific action plans for manufactures, customers, sellers and governments in order to prevail greaseproof paper. Since people's habits are not easily changed, only plans and policies are not enough. Accordingly, we also come up with pattern designs to motivate package collection and recycling.

After showing the public the prototype of our design, we obtained valuable feedback and suggestions for future improvements. In the next iteration, we plan to improve on the convenience of collection as well as the layer design of our package. We also want to come up with more detailed plans to improve public awareness of environmental conservation.

In conclusion, our plan integrates innovation as well as careful consideration in an interdisciplinary way. And we think the final design is practical because its high-probability of popularization and efficiency in pollution reduction.

# Identify the Challenges

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## 1. Stakeholder Analysis

### 1.1 Challenges from Suppliers

Currently, plastic packaging occupies a large market share in the packaging market. That means many packaging firms have a generally large investment in the production of plastic package. It's difficult to persuade them to make a shift from plastic to paper, because they need to refresh their production line, which will incur a big cost. From another aspect, the change to paper packaging may cause problem in the industrial chain of plastic production. So, we need special tactics to proceed the packaging revolution.

### 1.2 Challenges from the Governments

A new paper package introduced to the market will face legal censorship and restrictions. Plus, we need support from the government to promote the paper packaging. For example, we need government to grant subsidies to those who produce paper packaging. From the government's perspective, for people's welfare, it is happy to see green products, as long as the government has no hidden interest with plastic industry.

### 1.3 Challenges from Popular Consumers

If there are simultaneously two kinds of packaging for the same food on the market, with different price, consumers who buy food in bulk may still choose the plastic package with the lower price. So, we need to appeal to public awareness of environmental protection.

### 1.4 Challenges from the Market

The food packaging market have already been mature for a long time. The chains of production, supply and retail are relatively too solid to break up. That will impose a big challenge for us to introduce our next-generation package to the market.

### 1.5 Challenges from the Product Itself

The core of our innovation is the product itself. In order to produce an eligible alternative for plastic package, we need to consider from three aspects: safety, cost and user experience. How to prevent over production? How to attract consumers? How to make it suitable for different kinds of instant food? These are challenges we need to examine very carefully.

## 2. Preparation for STEEPLE Analysis

STEEPLE is an acronym for the Social, Technological, Economic, Environmental, Political, Legal and Ethical opportunities and threats of the external business environment. Generally, STEEPLE analysis is used to analyze the external environment for the whole business. However, the idea of STEEPLE analysis can be

well applied in the case of our new product of paper packaging, which will make this action plan work better in realistic context.

### 2.1 Social

To promote our product, we need to concern the social context in Chinese instant food market. We need to consider the level of civilization in the society. Will most people choose to use paper packaging with a higher price for the sake of environment?

### 2.2 Technological

Although paper packaging is not a high tech product, we still need to examine the process of manufacturing paper. We need to consider whether paper production is much environmentally friendly than plastic production, given that paper production may consume a lot of water and woods. How modern technology can optimize the process of producing paper.

### 2.4 Economic

In this case, macroeconomic environment doesn't relate that closely with our project. What we need to concern is the cost of the package. Reducing the cost and improving the quality is one of our priorities.

### 2.5 Environmental

Given the fact that plastic can't degrade easily and it will pollute nearby soil, paper packaging definitely holds the ace, as paper is composed of organic fiber. We need to think about how to use recycling process to save paper (woods and water) resources.

### 2.6 Political

How to gain government's support is one of our biggest challenge. In China, such project will doom to fail without governmental force.

### 2.7 Legal

We need to examine the legal and safety standards for food packaging before introducing it to the market.

# Identify a Root Cause

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- 1.The demand for ready-to-eat products is growing as people move faster and faster. However, the importance of the environment is not recognized in the development process, resulting in the problem of excessive use of plastics.
- 2.The emphasis on convenience in modern cities makes almost all ready-to-eat products on the market are made of plastic as outer packaging, which is convenient and hard to break.
- 3.Compared with other packaging materials such as paper, plastic production costs are lower and traders are more profitable, such as the snack stand since the cost of the plastic is only 0.14RMB.
- 4.The lack of awareness of white pollution (plastic) has led to a growing number of cities in recent years where plastic landfills are about to fill. And now , many cities' plastic landfills are nearly full.
- 5.It is difficult for the plastic to degrade, and the harm to the biosphere is irreversible. For example, from offshore to ocean, from the equator to the poles, from the surface of the ocean to the depths of the ocean, ocean micro-plastics are everywhere. Also, Micro-plastics themselves contain plasticizers and absorb toxic and harmful substances from the environment. When they are ingested by seabirds, fish, benthic animals, zooplankton and other Marine organisms, they will damage the digestive tract of Marine organisms, or stimulate their gastrointestinal tissues to produce a sense of fullness and stop eating. The toxic and harmful substances they carry will also have adverse effects on Marine organisms

# Generate Solutions

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## 1. Use grease proof paper as package material

Since plastic requires plenty of time to degrade and often causes biomagnification in animals and humans, replacing plastic with grease proof paper will help reduce white pollution to a large extent. Grease proof paper is produced by refining the paper stock, which comes from raw wood pulp and can be derived from the recycling of paper material, and this creates a sheet with low porosity, making it degradable and impermeable to oil and grease. Besides, grease proof paper is light and easy to pack, which is perfect for the package of ready-to-eat food.

## 2. Design the package to be economic and material saving

Often times, package bags for ready-to-eat food can only be used once, since the food is eaten tight away. Therefore, designing the package to be material saving not only saves the cost for manufacture, but also cuts off the waste from over-packaging. There mainly two ways to save the raw material needed for each bag. Firstly, reduce thickness of the paper as much as possible on the basis of keeping the paper's necessary strength and impermeability to oil and grease. The specific thickness can be decided depending on the characteristics of the foods packaged. In most cases, we would suggest using 0.08mm paper, which is a little thinner than A4 paper. Secondly, design the connection parts to be efficient in order to save unnecessary use of material.

## 3. Manufacture package bags of different sizes to avoid over packaging

Many sellers today pack foods individually. The most common example is in the bakery. The design company should design different size of grease proof paper package so that if a consumer buys more than one piece, they can be put together to save material.

## 4. Add different elements on the package to encourage collection

Adding patterns on the package bag can be a smart strategy to encourage the collection of used package bags. The design company can design a set of beautiful pattern elements and print one on each package. When consumers collect a full set of these elements, they can hand all the package to the seller in return for some financial rewards. And each kind of pattern will have an equal chance of appearing on the package, in case the package with frequent occurring patterns is deliberately discarded.

## 5. Set up a reward system for the recycle of grease proof paper package

After the seller collects all the used package from consumers, they can hand it over to a company funded by the government and get money for the recycle of used grease proof paper. Since all used package is collected in one place, the materials can then be recycled to form paper stock again.

#### 6. Provide allowance for producers of grease proof paper package

Government should provide allowance for the producers of grease proof paper package, and at the same time, increase the price of one-off plastic package through taxes or restrictive policies. There are three major advantages. Firstly, it will stimulate more people to engage in the production of grease proof paper package. It's likely that some producers of one-off plastic package may instead choose to produce grease proof paper. Secondly, it can help lower the price of grease proof paper in the market, making it more economic and affordable to sellers and consumers. Thus propel the popularization of grease proof paper package.

#### 7. Educate the public to care for the environment

If the overall awareness of environment protection and sustainability development can be improved among the public, more people will tend to choose environmental friendly packages and refuse over packaging. Therefore, we would like to give out pamphlets to the public and print some slogans regarding environmental protection in some noticeable locations. Besides, we can also establish some popular science societies on internet platforms like wechat or weibo to strengthen more people's understanding of the severity of current situation. Governments should also fund environmental education in schools for children to develop a sense of responsibility early in their life.

#### 8. Promote grease proof paper package in different ways

According to our secondary research on local distribution channel of food grade plastic and paper food package, the price difference between two materials can't be ignored. For the same size of 20cm\*20cm, the unit price of paper package is 0.05 yuan, while that of plastic package is 0.028 yuan. Due to the cost difference, great efforts are needed in order to promote greaseproof paper. Firstly, advertisements can be made to inform people of the benefits of this new type of packing material in all sorts of social platforms. Secondly, cost-friendly policies can be made to make the package affordable to a wide variety of customers. Thirdly, stars and idols in the entertainment industry should use their influence to promote environmental-friendly package, leading people to choose greaseproof paper as their material.

# Identify the Criteria

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1. Is it convenient for the public to accept the plan?
2. Can we keep the economic cost reasonable?
3. Can the plan be popularized to a wide range?
4. How effectively can the plan replace or reduce using the plastic?
5. Can the plan reduce its impact on the environment?



# Evaluate the Solutions

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No.Solution 1.2.3.4.5.Total

1 Produce food containers with difference size 8 6 7 6 4 31

2 Design the food containers into a collapsible form 8 5 6 4 4 27

3 Design the food containers with different patterns 9 6 9 4 4 26

4 A reward system(encourage the seller to recycle the package box) 6 7 6 7 8 34

5 Establish a recycle window for packing boxes 4 7 6 6 7 30

6 Use paper to produce the packing boxes 6 5 5 8 5 29

 [evaluation form](#)

# Make an Action Plan

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## 1. Brief Description of the Design and Result of Our Popular Survey

To make a more feasible and customer-centered action plan, we used online public survey to gather information about people' s preference of food packaging. According to the survey, people generally would prefer to use environmental-friendly packaging materials for instant foods if they have decent price and functionality.

## 2. Product Design

### 2.1 General Introduction of Material Selection

The choice of material of our food package is our primary concern and the key to success. To find an alternative to plastic packaging, we need to examine the new material from following aspects: safety, cost and user experience. Plastic materials are driving our environment over the tipping point, where the landfill of plastic is devouring arable land and city. Plus, the production of plastic involves huge energy consumption, oil exploitation and environmental pollution, making the decomposable plastic either undesirable. Moreover, although biomaterials are trending among several fields like agriculture and clothing, few are applied in food packaging industry considering its cost. After comprehensive debate and discussion, we finally choose paper material as the best alternative for our product, which is naturally decomposable and recyclable. Some may argue that the production paper is a great waste of water. However, present technology has well addressed the problem by the application of internal water recycling. In summary, we will strive to use dexterous design to endow seemingly ordinary paper material with next-level feasibility and functionality for instant food packaging.

#### 2.1.1 Safety

Food safety is a long-lasting concern in the modern world. Food packaging is an integral part of public health, aside from the quality of food itself. Traditional plastic materials involve differentiated quality, ranging from extremely low-cost, non-food-grade plastic bag to standardized, qualified food grade plastic material. Due to the limitation of control and supervision, a large amount of non-food-grade plastic food coverage flows into the market constantly, causing severe health problems imperceptibly. In comparison, paper materials are generally non-toxic to human body. Also, the chemical process of making paper is way easier than that of producing plastic, so it will be less difficult to standardize the production of paper. In our product design, we apply food grade paper materials, but certain characteristics like thickness and grease-proof performance are varied across the product portfolio, considering we are designing packaging for various kind of instant food. According to the Chinese regulation on food safety (GB 11680), the

paper coverage of food should not derive from wastepaper or social-recycled paper and the use of fluorescent whitening agents and other toxic chemical agents are prohibited. Of course, our product will comply with the regulation, and will be open to supervision for certain authorities. More straightforwardly, we will apply paper made from raw wood pulp, which is the safest type of food grade paper.

### 2.1.2 Cost

According to our secondary research on local distribution channel of food grade plastic and paper food package, the price difference between two materials can't be ignored. For the same size of 20cm\*20cm, the unit price of paper package is 0.05 yuan, while that of plastic package is 0.028 yuan. Based on real situation in Nanjing, we assume a sole-trader snack vendor sells totally 250 deep-fried dough stick, pancake and other snacks each day. If he or she uses plastic package, the monthly cost for packaging will be  $250 \times 0.028 \times 30 = 210$  yuan. If he or she switches to paper package, that cost will be 375 yuan. In other words, the cost of paper package is nearly twice as much as plastic package. It may not be a big deal if the business is small, but for large supermarket or retail businesses, such a cost gap will be enlarged and so it's very unfavorable. We understand profit maximization is one of the most important business objectives, so we have a plan to cooperate with baker's retailers, like Suguo, Paris Baguette and 85°C. The key is to appeal to the corporate social responsibility, which will help the business establish a good brand image, and finally indirectly leads to the profit increase. The detail of the operation mode will be elaborated in 4.2.1. Furthermore, the shift from plastic to paper package can be a unique selling point for some businesses. If further propagandized, the green package will be a symbol of business ethics. Then, other retailers and even small vendors may follow their footsteps to make the alteration in packaging. Plus, later in real production, we will design the package in an optimized way, by manufacturing package bags of different sizes to avoid over packaging. This can lead to the further decrease of the cost. In the following part of this section, we will have a deeper discussion about external factors to promote the use of paper packaging.

### 2.1.3 User Experience

User experience is one of the primary concern of businesses to determine which packaging material to implement. In many cases, it is the packaging that make a certain product stand out among countless similar products. Let's imagine a common phenomenon in China: many breakfast vendors cluster down the same street. True, taste of food is one of the customers' criteria. However, it's probably safe to say that the competition due to taste has reached an equilibrium in this street (as long as it's not the first day when all these vendors come here), by the principle of natural selection. So, in this case, taste may no longer play god. Hence, packaging style and quality of service will be the primary factor to switch between different vendors. As customers, people generally prefer paper packaging, considering that plastic transmits heat efficiently, which may hurt people's hand, and the texture of plastic isn't that desirable for humans, but paper, especially

thick paper, can be a protection from heat and paper touches more comfortably, without scratching noise. Plus, on paper packaging art and slogans are welcomed, raising the paper packaging to next level. In later discussion in this section, we will put forward a plan to make the decoration on our paper coverage become a USP (unique selling point) for businesses. So, we can conclude that paper packaging will bring more satisfying user experience, hence expanding the customer base for a certain food vendor or baker's business. This will finally make the extra cost of using paper packaging rather than plastic packaging cancel out, if the competitor businesses generally use plastic coverage.

## 2.2 Description and Visualization of the Design

### 2.2.1 Use hardboard to prevent excess plastic

We design boxes with three sizes to put different food. The sellers can also choose to put several small food in large boxes to eliminate waste. The total volume of the small box, median box, and large box respectively is 942ml, 3015ml, and 6283ml. These almost can put every instant food. Also, we put PE inside to keep sealing.

### 2.2.2 Buckle design

We design two buckles on two opposite side of the boxes. For the inner buckles, it can prevent food from falling out of the box if the outer buckle comes loose.

### 2.2.3 Collapsible structure

Our product can significantly reduce the surface area needed before and after using. After using, people can fold the box and put in their bags to save.

## 3. STEEPLE/ PESTLE/ PEST Analysis

### 3.1 A General Introduction to STEEPLE Analysis

STEEPLE is an acronym for the Social, Technological, Economic, Environmental, Political, Legal and Ethical opportunities and threats of the external business environment. Generally, STEEPLE analysis is used to analyze the external environment for the whole business. However, the idea of STEEPLE analysis can be well applied in the case of our new product of paper packaging, which will make this action plan work better in realistic context.

### 3.2 Social Factors

With the popularization of elementary education and access to Internet in China, more and more people, especially the young generation are becoming more aware of the global problems like climate change and environment degradation. Also, in the Chinese education system, children are encouraged to use more environmentally friendly materials in daily lives. For example, in elementary school textbooks, the use of plastic bags is clearly discouraged. So, it is easier to persuade these people to make a shift to our paper packaging. Then, the multitude of customers will gradually develop the habit of buying food with paper coverage, while businesses is also willing make the switch.

### 3.3 Technological Factors

As mentioned above in 2.1, present technology has well addressed the problem of the squander of water resource in paper production by the application of internal

water recycling. Also, the production of modern food grade paper has already been mature enough for decades. However, the production of decomposable plastic or biomaterial isn't really as stable and mature as that of paper material. So, technologically speaking, paper packaging is the easiest and most feasible idea in the current phase.

### 3.4 Economic Factors

In this case, macroeconomic environment doesn't relate that closely with our project.

### 3.5 Environmental Factors

Technological advancement has transformed the paper production into an environmentally friendly industrial process, especially compared to the production of plastic. Some may still doubt that paper production is devastating for forests. However, we would like to point out that oil, as the raw material to produce plastic, replenishes at a much slower rate than that of forests, which can be planted by humans. So, from the perspective of environment, our paper packaging will win out over traditional plastic packaging.

### 3.6 Political Factors.

Currently, environmental concern has been raised to the national level. So, it is safe to say that in China, the government support the development of non-plastic alternatives for food packaging. That means our project is following the political trend, which makes us easier to promote the product.

### 3.7 Legal Factors

As long as we comply to the regulation on food grade paper (GB 11680, mentioned above in 2.1.1), the laws on patents and other legal requirements, we will not face too much difficulties in promoting the product.

### 3.8 Ethical Factors

As it stands, our paper packaging is environmentally friendly, which means it is ethical from the society's point of view. Plus, we will try our best to control the cost of production to provide food vendors with accessible price. Our aim is to promote environmentally friendly materials without hurting the interest of micro businesses. We consider the project generally ethical.

## 4. The Marketing Mix

### 4.1 A General Introduction to the Marketing Mix

Generally, the marketing mix of a certain product involves price, promotion, product and place. Among these 4Ps, our product and related analysis have been explained in detail. Also, we strive to make the best alternative for plastic packaging in instant food industry, so the places where the marketing happens are generally sole-trader snack vendors, baker's stores, big snack businesses, etc. Then, we will focus on price and promotion, two interrelated factors in marketing.

### 4.2 Description and Explanation of the Marketing Plan

As mentioned above, we seek to compress our production cost to make the product competitive compared to plastic packaging. This will lead to further decrease in the price. Next, we will try to promote our products both by internal

push and external support.

#### 4.2.1 Internal Innovation (Sparkling Design and Recycling/ Rewarding System)

To encourage people to use our special paper packaging, we will design a portfolio of collection of our products. This can be achieved by engraving (on harder paper) or printing (on slimmer paper) certain unique patterns, like different elements in the periodic table, to kindle people's passion to collect these paper packaging. Once they get the full collection of our paper packaging, they can return them to certain shops to exchange for shopping discount promotional codes (this may require a new business mode, or initially just use government subsidies to compensate the cost of discount in the shops). When these shops accumulate those returned packages in certain amount, they can ship them back to recycling factories. That will form a positive feedback loop in the society, where people continue to use our paper packaging. Also, this will effectively solve the problem of recycling, pushing our project to the next level.

#### 4.2.2 Further Promotional Plans

##### 4.2.2.1 Above-the-line Promotion (Advertisements)

Our plans for above-the-line promotion includes public media involving Internet and paper publications. As the project proceeds, we will register an official account on WeChat, along with popular video sharing platforms including Tik Tok, Bilibili, Kuaishou etc., to publicize our ideas and products. We would produce original short videos to introduce about the plastic crisis and promote our specially designed paper box. Aside from the e-promotion, we will also be focusing on paper publications. As we have magazine club in our school, we will directly write feature articles about our product, along with the illustration of plastic pollution. When these magazines are sold or distributed, we can further spread our ideas.

##### 4.2.2.2 Below-the-line Promotion (Sales Promotion)

The collection-rewarding-recycle system has been elaborated in 4.2.1.

#### 4.2.3 External Stakeholders

##### 4.2.3.1 Governments

First, the government can use grants and subsidies to catalyze the production and recycling of our paper packaging considering its nature of a social benefactor. For example, the government can grant subsidies to shops who promote the predominance of paper packaging. Second, the government can raise certain environment-related tax to discourage the production of non-decomposable plastic packaging, which may lead to certain businesses to transform into paper packaging manufacturer. Third, the government need to enhance the publicity of environmental awareness and CSR (corporate social responsibility), to make people change certain values. Finally, the government should help build a closed cycle of paper recycling to prevent the waste of paper materials.

##### 4.2.3.2 Consumers

As stated above, consumers have the access to our rewarding system, which can boost the recycling process. Sometimes, consumers may find the price of paper packaged food is slightly higher than their plastic packaged companions. We

strongly recommend the consumers to choose the ones with paper packaging. After a while, plastic package may be sifted out of the market.

#### 4.2.3.3 Suppliers

We encouraged more and more packaging producers to become our suppliers. This can not only help you make profit and receive governments' privilege, but also improve your brand image in supply-side. Whatever in the short or long run, producing paper package is always a wise choice.

#### 4.2.3. Pressure Groups

Aside from internal improvements and governmental assistance, we welcome social pressure groups like media and Internet platform to intervene, to shape people' s value in environmental protection and discourage the production of non-decomposable plastic.

#### 5. Conclusion on This Section

We follow the procedure of identifying the problem, making feasible design and implementing realistic analysis and plans to make an action come true. Plus, this section involves dexterous but straightforward business management knowledge to help us analyze real-world situation.

 [design sketch](#)

# Prototype and Test

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## | Prototype Design

1. Use hardboard to prevent excess plastic

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2. Buckle design

We design two buckles on two opposite side of the boxes. For the inner buckles, it can prevent food from falling out of the box if the outer buckle comes loose.

3. Collapsible structure

Our product can significantly reduce the surface area needed before and after using. After using, people can fold the box and put in their bags to save.

 [design sketch](#)

## | Feedbacks learnt from users

131 people have involved in the survey about public acceptance towards our replacement plan for instant food package. The people of this survey are from different ages: under 15, 15-34, 34-60 and above 60. therefore, our data is statistically reliable to a certain degree.

1. quantitative feedback

1.1 89 out 131 respondents doesn't care about the difference between grease proof paper and plastic bags, and 70% of those who care about the difference suggest that it's because they are concerned about the environmental problems brought by plastic bags.

1.2 85.5% respondents think it is completely fine to put different pieces of food together in one package. However, 73% of the respondents report that in reality they always use different package to pack different pieces of food, which is a huge waste. Therefore, it's urgent for the replacement design to be applied in the market.

1.3 14.5% of respondents suggest that they don't want to put different food together.

1.4 After seeing our design prototype, 88% respondents report that they are more



willing to collect the used package and give them back to sellers for rewards, owing to the patterns of elements printed on the package and the reward system.

## 2. Qualitative feedback

2.1 Most of our respondents aren't clear about the exact impact and damage of plastic package to the environment. They are only somewhat aware of the downsides of this kind of package.

2.2 Some respondents imply that they may buy more products instead in order to collect the package with attracting patterns.

2.3 Of the respondents who don't like to pack food together, most of them identify a concern for the problem of tainted order.

2.4 Some respondents offer us suggestions, such as using degradable material and finding ways to further cut down the cost of package production.

 [survey](#)

# | Improvement for next iteration

1. Some respondents reported that putting foods together may lead to tainted order, which influence the flavor of foods. We can add layers to the design of large size package (picture). Moreover, we would also suggest sellers to use wafers to separate different kinds of foods. Wafers are thin layers of paper made of starch and therefore are edible.

2. Some respondents are concerned about the sanity issue of greaseproof paper, which is not necessary. Because greaseproof paper is produced by refining the paper stock and thus create a sheet with very low porosity, which results in the impermeability

3. Some respondents also reported that compared with plastic bags, paper package is sometimes fragile. In cases where consumers need to take the foods away rather than eating directly, we would consider package made of cellophane, which is a denser kind of grease proof paper. However, we think that higher intensity package is not necessary in most cases for ready-to-eat food and the price for cellophane may be too high to afford. Therefore, we would suggest consumer who need higher intensity package simply packaging their food with two layers of greaseproof paper.

4. A very small groups of people, mostly young people, think they may buy more than they can eat in order to collect the elements on the package. We think the best way to solve this problem is through education from parents.

5. According to the survey, we found that most people are only socialistic about "white pollution" . We decide to print some facts about the impacts and problems caused by white pollution in order to increase public awareness of white pollution.

6. In response to some respondents' concern that the process of exchanging prizes may be time-consuming and money costing for sellers, we think it will be

better if we design a mini-program in Wechat which allows consumers to draw prize provided by the local government. When consumers collect a full set, sellers can give them a code to join a prize draw.

# Team Credits

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袁子晨 Yuan Zichen: I am in charge of the general solutions, prototype, and test. I provided general ideas about the solution to the problem and I also designed a questionnaire and collected useful data for analysis and further improvements on our design.

张予钦 Zhang Yuqin : I'm responsible for designing our product and drawing it. I am also in charge of identifying a Root Cause, identifying the Criteria, and evaluating the solution.

史仲达 Shi Zhongda: I'm in charge of the sections of Identify the Challenges and Make an Action Plan, combining the primary research results from Yuan and desk research data from the Internet and social media.

# Judge Comments

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" Overall Comments:

I really appreciate that the team has gone into depth about the environmental impacts of plastic (including the major challenge posed by microplastics in the marine environment and the harmful chemicals that leach out from plastics and affect various ecosystems). I also commend the team for applying the STEEPLE model to this complex problem. The prototype section laid out an attractive and thoughtful design choice.

It would have been helpful to set the context of why the team chose greaseproof paper as the alternative to plastic food packaging. If the challenge being solved is environmental, are greaseproof paper the best alternative to plastic for food packaging? If so, why? Are there other potential solutions out there that might be better or comparable? This analysis and context setting was limited in the report.

The root cause section could be strengthened further by mentioning the chemical qualities of plastic that make it so commonly used – one of them being that it does not react with most food items and allows a universal packaging solution (with the exception of some chemicals like BPA released by heat from some types of plastics).

As a suggestion, it would be useful to partition your target market into smaller groups that can use the type of packaging you propose. Investing in 1 or 2 different types of designs that fit the smaller market will also make it easier to produce things at scale. The identified design is likely most useful for drier single food items. I encourage the team to continue this work and take it further!

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