LSE Psychological and Behavioural Science

Boxi: A Reusable Packing Solution

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Introduction

Food delivery frequency has spiked during Covid and with it, alarming levels of packaging waste (McKinsey, 2021). Our group aims to battle single-use plastic and recyclable waste from take-out food. According to estimates, England uses 1.1 billion single-use plates and 4.25 billion items of single-use cutlery - most of which are plastic - per year, but only 10% are recycled upon disposal (DEFRA, 2021). In the UK, landfill capacity is declining and ocean plastic pollution seriously harms marine life (Eyre-Walker, 2018; van Sebille et al., 2016). It is therefore imperative to reduce plastic use and eliminate unnecessary products. Our group proposes reusable containers to provide food delivery that does not cost the earth.

We propose a venture, called Boxi, that allows restaurants to send their food deliveries in reusable boxes. Participating restaurants order new boxes when needed and exclusively use them, instead of single-use plastic boxes. When end-customers order food through an app, they can identify our partnering restaurants. Upon their order at such a restaurant, the end customers pay a deposit fee for the reusable box. This fee will be returned to their account once the box is brought back to a collection point. We use a barcode system to track the boxes' accurate location.

Boxi targets the gap between policy guidance and the market. The UK government has already introduced a plastic packaging tax and has explicitly indicated the intention to ban single-use plastics in the near future (DEFRA, 2021). Even though this change is foreseeable, there is no company in the UK market providing the corresponding services, according to our best knowledge. Therefore, we aim to occupy this market niche and grow a network of participating restaurants to become the market leader when the regulation finally bans disposable plastics.

We begin our analysis by conducting a stakeholder analysis as summarised in Figure 1.

Figure 1: Stakeholder Analysis

Given the stakeholders, we draft an ideal daily cycle of Boxi as illustrated in Figure 2. This preliminary plan requires Boxi to be fully independent with the collection, centralised cleaning, and redistribution for the best convenience for restaurants.
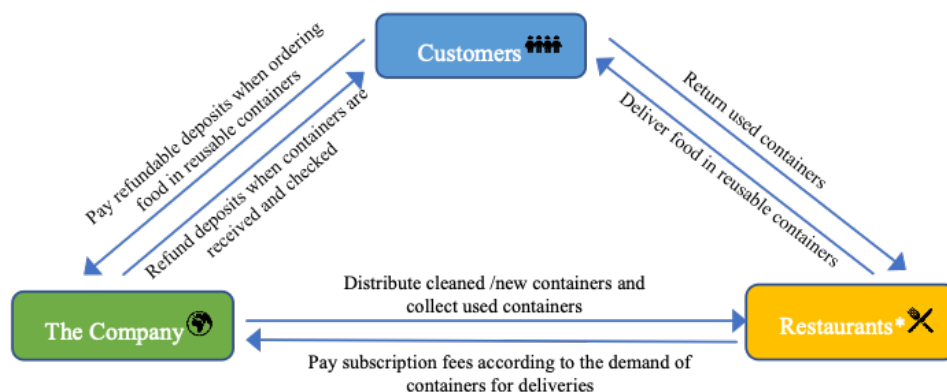
Figure 2: The Ideal Model

To gain an overview of the industry and its common practices, we scored several different countries and found a reusable container program led by Deliveroo France. We contacted the representative, Damien Steffan, and conducted an interview, after which we decided to opt for decentralised cleaning (by restaurants) instead. At least for the start of Boxi's implementation, it is more economically feasible and further, more environmentally friendly, since it requires less transportation and internal infrastructure. However, we recognize that this shifts the burden onto restaurants, which will be discussed further in the limitation part.

The paper is structured as following, it begins by analysing the requirements for Boxi in each stage of the system. Further, based on these requirements, it will elaborate on the financial demands, design, and communication strategies. This will be followed by our limitations and a conclusion.

Production requirements research

Legal Requirements

Firstly, the box must adhere to current European health regulations. The box must obtain a Declaration of Compliance (DoC) from the European Food Safety Authority (EFSA) to ensure that the container complies with the regulation to prove its material safety and food compatibility. These regulations will also serve as guidelines in this project to select a fitting material and design.

Four regulations must be taken into account: EU 1935/2004 (1); EU EC 10/2011 (2); EU EC 282/2008 (3); and EU EC 2023/2006 (4). The first regulation governs the fundamentals regarding Food Contact Materials (FCM). It stipulates that FCM must not:

- Release their constituent at harmful levels
- Change the composition of the food, its taste, or its odour

Regulation 1 also introduces the compulsory Good Manufacturing Processes (GMP) to obtain a DoC. Regulation 4 clarifies the details of the quality assurance and control systems that are part of the GMP. GMP entail that the sourcing of the material and the manufacturing process must be laid out and rigorously followed to ensure the quality of the box. Regulation 1 sets the Overall Migration Limit (OML) for plastic FCM to $10mg/dm^2$. Regulation 2 tells us that the type of plastic Low-Density Polyethylene (LDPE) exceeds the OML when in contact with fatty food. According to regulation 1, the box must also be traceable in case of an emergency recall and must bear the glass and fork symbol.

Regulation 3 focuses on recycled plastics. It says that whether the recycling process is mechanical or uses chemical depolymerisation, recycled plastics fall under the same rules. It makes the recycling process a new essential element of the GMP. The recycled plastics must meet the quality of the virgin plastics, thereby the quality assurance and control of the recycling process are added to the GMP. Regulation 3 explains that the sorting rigour when sourcing recycled plastic must be studied on a case-by-case basis. To ensure that the recycled plastic has not been contaminated, we should follow article 14 and test it or use only plastic from products originally made to be FCM. The easiest way remains to request the field of application of recycled plastic from the supplier. Since the GMP change, the DoC will also have updated requirements which can be found in parts A and B of Annex 1 of regulation 3. Finally, the final product made of recycled plastic must be labelled according to EN ISO 14021.

Physical Plastic Requirements
Now that the legal grounds have been established, this next part will argue for the choice of plastic for our box and its lid. The product must be able to contain sour, sweet, salty, fat, hot or cold, solid or liquid aliments without migrating into the food, leaking, or changing or bringing a change to the taste and odour. It must be easily sourced, recycled, and manufactured. According to the EFSA, authorised plastics to make FCM are Polyethylene Terephthalate (PET), Low- and High-density Polyethylene (LDPE & HDPE), and Polypropylene (PP). Because of their limited ability to contain hot and/or fatty food, LDPE and PET had to be excluded (Hardin, 2021; Coda Plastics, 2017; Pars Ethylene Kish, 2018; 3devo, 2020). We are left with HDPE and PP which are both widely used as FCM.

Recycled HDPE and PP cost roughly the same, however HDPE is more recycled (Coda Plastics, 2017). HDPE also has a better resistance to corrosion and abrasion, and has less risks of leakage (Pars Ethylene Kish, 2018). Consequently, HDPE also has lower maintenance costs (Pars Ethylene Kish, 2018). While PP is sensitive to UV rays and certain metal which can accelerate its decay. HDPE also has a sufficiently high melting point at 125°C, with food never exceeding a 100°C and dishwashers in restaurants usually operating at 85°C (Serv Safe International, 2015). Therefore, HDPE seems to be the best option.

Regarding the lid, a recycled silicone cap seemed to be the best choice, because it is easy to recycle, airtight, flexible, easy to clean, and resistant to high temperature. However, information regarding recycled silicone has proven to be difficult to acquire. Therefore, we also recommend using HDPE for the lid.

Finally, to ensure the antimicrobial property of our product, we will have it treated by Microban (https://www.microban.com/). This company applies a layer made with silver to give the product antimicrobial properties, reducing the risk of bacterial growth and making our product more hygienic.

Return and Storage requirement
To make our service attractive to restaurants, two potential bottlenecks, storage and returning, need to be addressed. Storage space is oftentimes a scarcity, hence it is important to make our system feasible in that regard. We opted for a one-size-fits-all shape of the container to best fit the physical affordance of storability. For optimal storage, the boxes and lids should be able to be stacked separately.

We expect most of our customers to return their boxes because they are economically incentivized by a deposit to do so. We realise that some consumers will be tempted to keep the boxes because of the comparably low deposits. This will be tackled by tracking the boxes through a barcode system, which allows us to track the location of the boxes. Customers receive reminders for returning the boxes via

email if they have not returned them after 72 hours. We will send out 3 reminders in total - however, we do realise that some people will keep them regardless. This margin is expected and accounted for. Receiving returns would be simple if customers would only return the containers from the restaurants they received them from. However, to increase practicality for consumers, they are free to return their boxes to any participating restaurant. This could lead to inventory imbalances. Restaurants in popular locations could receive more returns than intended, whereas less frequented restaurants could receive too little. This will be counteracted by rebalancing inventory when restaurants notify us of the need, should they require to have more boxes (or to get rid of boxes). However, we rely mainly on the scanning system that provides us with an inventory overview of exact quantities and can collect and dispatch containers when and where they are needed.

Cleaning Requirements
The process of cleaning is two-sided: first, the consumer rinses the box before returning, and second, the box is cleaned at the restaurant. For these two processes to function smoothly, we must identify physical affordances, embodied competencies, and social regulations for three stakeholders: restaurants, consumers and manufacturers, according to installation theory (Lahlou, 2017).

As part of physical affordances, an end customer should perceive the material of the box as easily cleanable, rinse the box before returning, and receive a clean box in the first place. While another physical requirement of the box remains that it fits the cleaning system in the restaurant. The process followed is as such: the consumer rinses the box before returning it to a partnering restaurant. The act of rinsing the box before returning is part of their (end customers) embodied competencies as this action requires motor skills, education, and experience (Lahlou, 2017). Lastly, all three stakeholders have a "moral" and also legal obligation to provide as well as receive a clean and hygienic reusable box. This comes under the social regulation that the three main stakeholders have to perform.

Usage Requirement
Next, the usage stage requires the containers to be standardised, easily operable, airtight, and able to preserve the freshness of the food.

The first stakeholder in this stage is the restaurant employee who faces the social regulation to take prompt actions to match order summaries from customers and cook food in the kitchen, where the physical affordance is crowded with receipts and kitchenware. The task is already complex and time-sensitive, so the containers must be easily identifiable and operable to avoid causing extra burdens to their embodied competence.

Then the delivery man passes the food from the restaurant to the end customer, where the airtight trait is the crucial requirement. Because the delivery man often carries several containers of various food together (physical affordance) and hurries (social regulation) on and off the bike, an airtight box will prevent the inter-influence between different flavours, as well as spilling during the process.

When the food arrives at the destination of the end customer, the container must guarantee as good freshness, if not better, than single-used boxes after the delivery process of approximately 30 minutes (Curry, 2022) to efficiently overcome the psychological barrier of sustainability liability (Luchs et al., 2010) for the end customer to continuously attend the reusable container program.

Finance

Given that our business might attract food delivery platforms (FDP), we budget so that this venture becomes a branch of said FDP. Hence, our financial projections will rely on the FDP's resources to finance such a venture. Knowing that FDP already have infrastructures, there is potential for them to exploit their various capitals and assets. For the following projection, Deliveroo will be taken as a benchmark FDP.

The fixed costs will mainly encompass: office space for the new department, collection vehicles, the inventory programme and collection machines, depending on the collection system. It will also have to include the initial sunk costs of making the first containers to cover the 140,000 restaurants delivered by Deliveroo in the UK. The following computation is a mere forecast of what this investment could amount to but there are costs that we cannot factor in and economy of scale, existing assets, and B2B deals advantages that, as students, are not in the capacity to include. Additionally, prices for recycled silicone proved difficult to find, thereby the computation will be based on a container made of only HDPE. Nevertheless, based on the dimensions of the box and the price of recycled HDPE averaging 6 €/kg (Precious Plastic, 2022), the cost of raw material to make the bottom and the lid of the container should approximate €4.3031625 per box. The density of HDPE is on average 970kg/m^3 (Plastics Europe, 2021). Given that 140,000 restaurants deliver on average 30 orders a day (Ask Wonder, 2017) and that seven days a week could mean that the initial number of boxes that should be made is: 29,400,000. This will amount to €126,512,977.5. To put this number in perspective, the latter represents 57% of Deliveroo's (one of many FDPs) revenue in 2020 (Business of Apps, 2022). Given that there will be the cost of manufacturing them and other unforeseen costs this amount should be expected to rise much higher. Since this hypothetical forecast already represents more than half of their yearly profit, we suggest that FDP look into receiving financial help from investors, and subsidies from governments and scale this programme over several years to install the fixed costs.

The variable costs will mainly encompass: raw materials for new containers; manufacturing of new containers; logistics; staff for the collection and the new department (operational management, marketing such as influencing campaigns, finance).

Regarding the cash flow, the boxes will operate as follows: the restaurants will receive brand-new boxes; then the end customer orders via the FDP, paying a deposit for the box, and receives their order in the box; hopefully enjoys their food; rinse the container and bring it to one of the collection machines; the machine scans the box and gives the deposit back if both the box and the lid are returned; the deposit is automatically added back to the customer's account on the FDP to be used on their future order. Once collected, the box will be brought back with others to a nearby restaurant by one of the collection staff. There, the box will be washed and the restaurant restocked. Depending on practicality in the early stages, the collection could be done in restaurants where staff will confirm reception by scanning the container.

According to the economists Kulshreshtha and Sarangi (2001), the size of the deposit is recommended to be equal to the net price for conscious customers but needs to be equal to the gross price to motivate lagging customers. Since we expect a mix of both, we choose a value that lies between net and gross price. Their work is recommended to be used once more data is collected on the price elasticity of demand, the cost of recycling, the marginal benefit of reusing a container and the benefits of recycling for the end customer. Based on this, we recommend the deposit to meet the price of a new container or approximately €5 since raw materials have been approximated to cost €4. Even though a deposit system involves a significant initial investment from the FDP, it is also a promising system since the containers

can be reused for 10 to 20 years and recycled up to ten times (AZoCleantech, 2020). A deposit system also has an array of positive economic advantages:

- No losses from unreturned containers
- Reduced litter
- Positive marketability
- Good customer feedback
- Raising environmental awareness

According to Recup (2022), the average restaurant, doing 30 deliveries a day with an average price of 0.18 cents per disposable container, would save up to €1,594 or 10,920 containers yearly, using reusable containers.

With this flow, restaurants do not have to buy containers anymore and do not have to verify their restocking thanks to the bar code system. Indeed, the latter allows a constant tracking of the box: from the restaurant to the consumer to the collection point and back to the restaurant. However, it has not yet been discussed with restaurants whether it is possible to integrate this into their daily operations and whether it does save them as much or more time and money as regular containers.

There is an added cost for the FDP to have collection staff, however, the bar code and deposit system will generate data that can be sold to cover these added costs as well as other variable costs, such as the production of new boxes. Additionally, this service should satisfy environmentally engaged customers and other consumers which will emerge as an added value to the FDP.

Design

As part of the installation theory, we know that physical affordances limit or initiate behaviour (Lahlou, 2017). A food delivery box, like every other object, must accomplish some affordances to be used as smoothly as possible. Being consumers ourselves, it was easy to identify certain affordances of a food delivery box. We believe a food delivery (reusable) box should deliver food such that its taste, presentation, and warmth are intact. Moreover, the box should be of the correct height, width, length, and weight for easy transportation and to fit in the cleaning system at restaurants. For a reusable food delivery box, it is also vital that it passes hygiene tests and is easy to use/clean.

The aforementioned were aspects we kept in mind while designing the box. As per the requirement research section, the material being used for the box is HDPE with a silicon or HDPE lid (See Figures 3,4,5). The dimensions of the box cannot be too small or too big. It needs to have enough space to carry a variety of food items but not take up a lot of space during the storage stage. Thus, the dimensions of the box are 195mm (length) x 135mm (width) x 55mm (height). These dimensions satisfy the conditions of fitting the cleaning system and not being too heavy or occupying too much space. Additionally, as part of the design, a note on the side of the box should read: "It's Cool to Care: 8 out of 10 users clean and return me!" (See figure 6). It is found that when people are made aware of what others are doing or not doing, they are motivated to engage in the same behaviour (Sunstein, 2014). Theoretically, these descriptive norms determine the likelihood of customers engaging in a behaviour which is something the majority of the population does (Kitts & Chiang, 2008). This little note aims to motivate our consumers to not only clean but also return the box on time as part of a nudging/descriptive norms strategy that uses social norms.

Following is our system of barcodes, developed to monitor the boxes sent out to consumers and their returns. Both the lid and the bottom have specific barcodes to track both pieces.

Figures 3,4, &5: Potential design for the box, a HDPE lid with locks, and a Silicone Lid

Figure 6: A note on the side of the box

Barcodes: Justification & Operation

According to Janakiraman & Syridal (2015), longer deadlines increase the endowment effect for products and lead consumers to postpone or delay return decisions. In line with this finding, we set a shorter deadline (3-7 days) for the customers to return the boxes to the collection point. During our

research certain questions such as "what if consumers love the box and do not return it?" or "How do you track each box?" were raised. To tackle these, our team came up with a barcode system. The system is simple. As part of its design, each box will have a barcode along with a unique reference number below it (see figure 7). The box is scanned for its barcode at two junctures. First, when the box is ready to go out of the restaurant to be delivered to an end customer. And second, when the box has been returned and is going to enter the cleaning system at the restaurant or at collection points itself. The special reference number attached to each box is scanned and registered on the central system. If the customer does not return the box before a prespecified deadline, the customer loses the deposit payment he/she has paid in the first place. This entire system helps keep track of which consumer has or has not returned our containers, thus tackling the questions mentioned above. Additionally, it also helps to monitor when collection points are full and when restaurants need restocking.
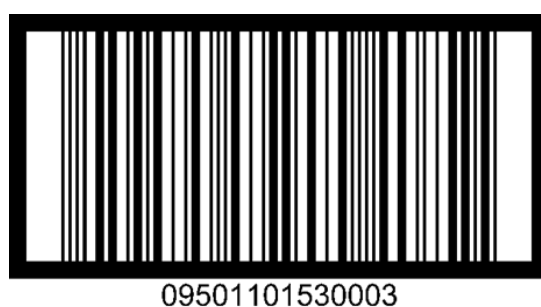

Figure 7: Barcode & special reference number on the side of each box

Why only one design for the Reusable container?

The current market relies heavily on single-use plastics, be it for packaging or food delivery. Our boxes use materials that are not only ecological but also the best economic option available. However, this begs the question "why not have more boxes (design and type) like this?" The answer is the same, due to the development of retail markets, a surge in the amount of packaging material has taken place. Using unnecessary packaging materials to pack and deliver smaller items just because it is convenient is a rising trend (Coelho, et.al. 2020). One would argue that more design types of these boxes should be made available to the consumers. However, by producing multiple boxes we not only bring more plastic to the environment but also disregard the economic burden of generating different types of reusable plastic boxes. Thus, we believe it makes ecological and economic sense to minimise product range.

Another line of thought for minimising product range has to do with the choice architecture theory. As per the theory, if a consumer is presented with multiple options all of a sudden, it decreases his/her motivation to buy a product and leads to decision fatigue. (Iyengar & Leppar, 2000) Overload of choices could be counteracted by limiting the number of available options or simplifying the attributes of choices available. (Johnson et al., 2012). Thus, it is a conscious effort to not overwhelm our consumers i.e. both restaurants and customers ordering takeaways.

Communication

Along with the attention paid to the design and the finance, we recognize the importance of communication with consumers. Although our product is sold B2B (business to business), it is important to communicate its advantages to the end customers as well. This also greatly helps in B2B negotiations, as restaurants directly benefit from the positive consequences, aka increased demand for our marketing efforts. In this section, we will categorise the type of end customers and restaurants we are targeting. Secondly, we will illustrate the respective targeting strategies. As follows, both end

customers and restaurants will be called consumers, as they are similar in their characteristics for most parts. There will be instances for which they differ, but this will be highlighted clearly.

Consumer categorisation

The consideration of consumer idiosyncrasies is crucial to understanding how to influence them (Liu, 2007). We categorise the consumers into four types and highlight the most relevant strategies for each type.

Table 1 Consumer & Restaurant categorization

Type	Characteristics	Most relevant strategies
Strongly Conscious	- Internally motivated to participate - High concern for environmental issues	● Transparency for distinguishing the system from greenwashing
Conscious	- Participate if socially incentivized	● Social norms ● Signalling opportunities
Semi-conscious	- Participate only if both social and economic incentives are strong enough	● A loyalty program as economic incentives
Lagging	- Refuse to change because of the focus on individual (business) efficiency, or out of inertia	● Legal regulations in the near future

Strategies

Strongly Conscious Consumers

Strongly conscious consumers are inherently motivated to reduce their negative impact on the planet. Once the reusable container system is developed, they will be eager to join, so we will target them by creating awareness for our product. However, because of their enthusiasm for sustainability, they are possibly sceptical about greenwashing (Indvik, 2022). To reduce potential scepticism, we aim for a very high degree of transparency on the environmental impact and the supply chain of Boxi (Eichengreen et al., 2020).

Transparency

On our website there will be a transparency section, indicating our sourcing and production locations. Further, the resources needed will be listed and contrasted to resources and waste demanded by single-use containers, given the same food delivery levels.

Awareness campaign
We will create awareness for Boxi through the use of social media campaigns. Since our budget is limited, we will work with micro- (5k - 100k followers) and nano influencers (<5k followers) on Instagram and TikTok (Guarda et al., 2021). Despite their comparably small following, they have proven to have a strong positive influence on brand attitude (Lehto Brewster & Lyu, 2020). Furthermore, parasocial relationships with followers are significantly stronger than they are for bigger influencers (Lehto Brewster & Lyu, 2020). Our strategy entails gifting a voucher for one food order (using our boxes) and sending an informational brochure about Boxi to a wide range of influencers. Even though there are no strings attached, we hope that some of the recipients will share a picture of their meal and our container on their channel. Furthermore, we will select a few content creators to do paid campaigns with. The paid campaign will consist of one video where the influencer explicitly highlights the benefits of Boxi and encourages their viewers to try it. We will choose content creators who are known to post about sustainability issues and make a positive societal impact. The budget for this will be £10.000 with an expected average range of £50-1000 per content creator (McClure, 2022)

Conscious Consumers
Conscious consumers are not as proactive but willing to contribute to sustainability if socially incentivized. In theory, their normative goals are not as pronounced as strongly conscious, yet they still identify and categorise themselves as someone who is sustainable (Tajfel & Turner, 1979; Turner et al., 1987). Therefore, social influence could be leveraged. For this type, we need to use social norms to motivate them to take action. Social norms form an unspoken code of conduct for group members (Prentice, 2007). Since people strive for adherence, they can be a powerful source of motivation (Sparkman & Walton, 2017; Bearden & Etzel, 1982). To create social norms we will employ signalling and dynamic norms.

Signalling
Signalling theory explains that people signal parts of their identity to others through certain signals. A signal could be wearing an LSE hoodie, drinking coffee at Starbucks, putting stickers on your Laptop or donating to charity. This identity-signalling behaviour is driven by the belief that it reveals specific information about the self to others (Gal, 2015). Both, end customers and restaurants will be given the chance to signal their positive behaviour to others, however, through different means. Loyal end customers, those who completed more than 15 orders, receive a stylish bag. The bag will be made from recycled plastic and is versatile in its usability. Restaurants, on the other hand, will be allowed and encouraged to use our logo in their stores and their marketing. Having Boxi stickers on their window fronts not only lets customers know that they can receive their food in reusable boxes, but also transmits the image of a restaurant that cares.

Figure 8: A stylish bag as a signal (Source: Lalo the Shop, 2022)

Dynamic norms

As outlined by Sparkmann & Walton (2017), dynamic norms are an effective measure to encourage changes in attitude and behaviour. Different from static norms, dynamic norms depict that the status quo is changing. They lead people to expect their surroundings to change in the future and hence, lead people to preconform (Sparkmann & Walton, 2017). When static and dynamic norms were contrasted in a field experiment, it was found that dynamic norms were twice as potent in inspiring people to choose a meatless meal as static norms (Sparkmann & Walton, 2017). To target our end customers we are going to use the statement: "More and more people are ordering food from Boxi Restaurants. Join the movement". The slogan for restaurants is: "The Boxi network is growing. Join the movement".

Figure 9. Advertising banner, targeted at restaurants.

Figure 10. Advertising banner, targeted at end customers.

Semi-Conscious Consumers

Similar to the previous two types, semi-conscious consumers are open to sustainable transformations but only when the change is accompanied by economic advantages. For end customers, the general price of a meal is identical, regardless of container type. However, when using Boxi they have to pay a deposit. To make up for this (potential) annoyance, we introduce a loyalty program which allows loyal customers to save money. For every seven meals ordered in Boxi containers, customers will receive one free meal worth up to £15. For restaurants, we add a calculator to our website through which restaurants can calculate the money and packaging waste they are projected to save thanks to Boxi.

Loyalty programme

The loyalty program not only provides economic incentives for consumers to choose participating restaurants for their food orders but also enhances their patronage to Boxi itself (Liu, 2007). This fosters the commitment to using reusable containers despite potential shortcomings, such as less choice of restaurants (Fournier & Yao, 1997). By becoming loyal to the programme, consumers are also less susceptible to negative information (inconvenience, for example) about the brand (Ahluwalia et al., 1999) and form a habitual acceptance, which will benefit the company in the long run when other competitors enter the market
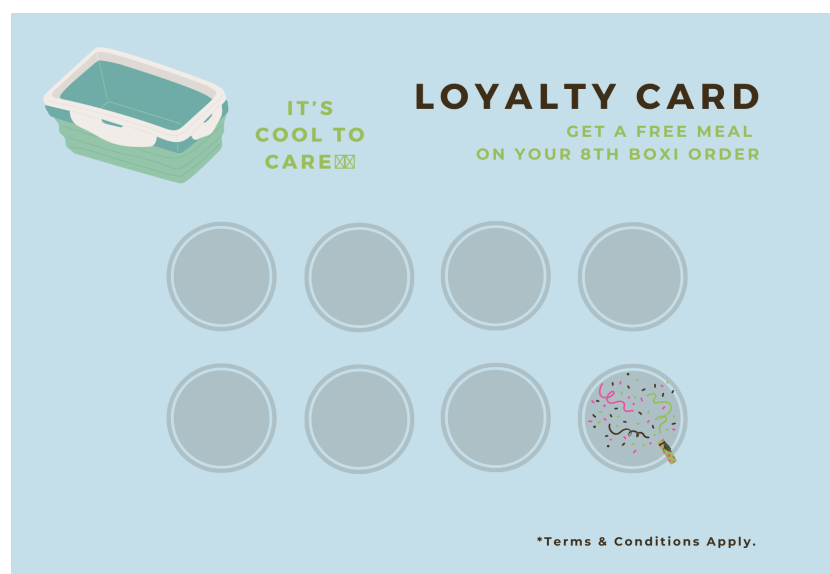

Figure 11 Loyalty card.

Plus, to encourage consumers to return containers timely, the loyalty program can be combined with a lottery ticket pool built into the unique barcodes of each box. Punctual consumers (returning within 72 hours) are eligible for lottery awards, which can include cash, gift cards, etc. Even without winning,

people gain positive effects on individual happiness (Burger et al., 2016) from the participation in lottery play, which motivates consumers to return containers properly.
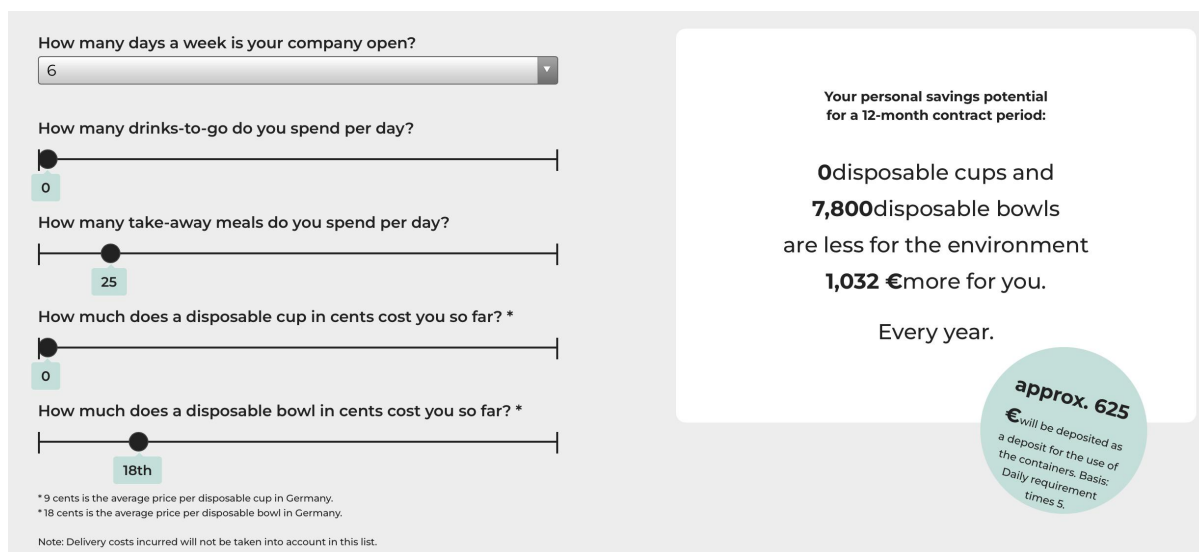

How many days a week is your company open?
6

How many drinks-to-go do you spend per day?
0

How many take-away meals do you spend per day?
25

How much does a disposable cup in cents cost you so far? *
0

How much does a disposable bowl in cents cost you so far? *
18th

* 9 cents is the average price per disposable cup in Germany.
* 18 cents is the average price per disposable bowl in Germany.

Note: Delivery costs incurred will not be taken into account in this list.

**Your personal savings potential
for a 12-month contract period:**

0disposable cups and
7,800disposable bowls
are less for the environment
1,032 €more for you.

Every year.

approx. 625
€will be deposited as
a deposit for the use of
the containers. Basis:
Daily requirement
times 5.

Figure 12: Calculator for restaurants (Recup, 2022)

Lagging Consumers

The last type of consumer, unfortunately, firmly refuses to change. The reason may be their ultimate interest in efficiency so that they will not "invest any more time or effort on delivery food", to quote one of our interviewees. Or they are simply lagging because of decision avoidance, meaning they are opposed to changes no matter what the consequences are and not paying attention to advocating messages (Anderson, 2003). We understand there is no plan perfect enough to involve everyone, and we will not be frustrated by the resistant minority since it will not compromise our main purpose. We hope legal regulations regarding banning single-use containers could be introduced in the long term, or the lagging consumers catch up spontaneously.

Limitations

We face a few limitations with this new system. Our idea is based on FDP, which means our model completely disregards the customers who would order takeaways at the restaurants. This is because, under the barcode system and our return policy, it would be difficult to track the boxes given to customers who ordered takeaways directly at the restaurant instead of using an FDP.

As this system is novel, we assume only a limited number of restaurants would participate at the beginning, which results in a lack of choices for end customers. Fewer restaurants also mean fewer collection point locations, thus deteriorating consumer participation in this scheme. Nevertheless, we hope that the restaurant participation rate will gradually increase and positively influence the willingness of consumers in the long term.

Lastly, despite the preliminary ideal model, we decide on a decentralised cleaning system where used boxes are collected and cleaned at restaurants. As central-area restaurants could receive more boxes compared to restaurants located in suburbs, the inventory imbalance has to be regulated by Boxi, which is an extra operating cost. Also, the burden of registering, cleaning and storing returned containers is on the shoulders of restaurants, which may constitute an obstacle for them to participate in.

Conclusion

We propose a model of reusable containers for food delivery. Even though this proposal is in a very early stage, the gathered information could prove useful to many FDPs looking into developing their own reusable containers or for third-party entrepreneurs looking to instigate a change.

In particular, we clarify the legal, manufactural, infrastructural and behavioural necessities and constraints to the best of our knowledge to scaffold such a project. The legal and production requirements are factual, thereby a focus on the physical affordances of the product must be developed further through field research.

Nevertheless, these fundamental findings lay the path for our forecasting of the financial plan, the design and the communication plan that might bear this project to execution. Overall, sending out containers to all participating restaurants presents a significant initial investment and requires meticulous planning to prevent severe economic losses. The design section develops the essential elements of a potential design given our choice of material and lifecycle, namely the cleaning in restaurants. Finally, our communication plan offers scientifically-based strategies to attract and retain the two primary stakeholders: end customers and restaurants.

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