Edibubble

PLAN

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How we came to be:

The idea behind an edible juice bottle began long before this unit. It actually began in a previous unit by student Ryan Maudgalya. As an assessment, Ryan researched the social, ethical, and environmental impacts of plastic water bottles. In his findings, he found that one of the solutions to ending plastic water bottles' destructive impact would be to create and support the consumption of edible water bottles. After discussion, a group was formed with the purpose of creating and selling edible water bottles to try and reduce pollution caused by plastic water bottles on a school scale. But, after some reconsiderations, it was decided that water wouldn't be a good product to sell as it is readily available in NIST. Thus the idea behind edible juice bottles was made. Our group was also largely inspired by Ooho water, the original creators of the edible water bottle. After discovery by Skipping Rocks Lab that water contained could be by a spherical container made up of simply sodium alginate and calcium chloride. Both of these materials are completely food-safe and edible with sodium alginate being created from seaweed and algae. Made to create an alternative less destructive way to consume beverages, and inspired by the good work of Ooho water, our group was created under the name Edibubble.

Mission, Vision, Values:

Mission: The mission of the Edibubble is to help the pollution problem that is so apparent everywhere. Every year, 400 million tonnes of plastic (only one type of non-biodegradable packaging) are thrown away and disposed improperly. Thus our mission is to research and create bio-friendly alternatives to nonbiodegradable packaging to eventually rejuvenate the state of our planet and ecosystem

Vision: Our vision as the Edibubble group is to reduce non biodegradable packaging firstly in Thailand and, potentially further, in the world. We envision a future where this type of packaging will be a thing of the past and bio-friendly alternatives will be the widely accepted way of packaging goods.

Values: We value creating safe alternatives to non-biodegradable packaging in new and innovative ways without harming the health of anything along the way as a group. We also feel that there shouldn't be any ethical violations during the creation of our products and thus it's a very valued part of our operation.

Research:

Disposal	https://healthyhumanlife.com/blogs/news/plastic-water-bottle-pollution-plastic-bottles-end	• Normally, after plastic packaging is used up, it is thrown into landfills or end up in the sea which is a problem as plastic doesn't biodegrade but instead photodegrades • Photodegradation is the process in which the sun and air around in atmosphere breaks down and alters materials which takes a much longer time to take place than biodegradation • 80% of the plastic water bottles we buy end up in landfills and just in the US alone, landfills are overflowing with 2 million tonnes of discarded plastic bottles • It takes up to 1000 years to degrade plastic and it releases harmful toxins throughout its lifecycle • Studies have shown that these toxins can be released into oceans as well and can also cause many health issues such as cancer and reproductive problems • Of the almost 36 million tonnes of plastic bottles thrown away in 2018, only 3 million tonnes were recycled and the other 33 million tonnes were thrown into landfills. • Every year, 8 million metric tons of plastic go into our oceans. That is the equivalent of 5 plastic bags for every foot of coastline on the entire planet. In 2025, the yearly plastic bag output into the ocean is predicted to double. • This plastic is then mistaken for fish and food by animals leading to them eating, and choking on the plastic, or dying of the toxins released by those plastics. • "Almost all juice boxes are made of composite packaging, which means they are made of multiple materials layered or smashed together. Juice boxes usually contain three to six layers of paper, plastic, and aluminum. The paper makes up 75% of the packaging and provides stiffness, strength, and an efficient brick shape. Polyethylene plastic makes up 20% of the juice box."

Edible water bottles	https://www.surfertoday.com/environment/what-are-edible-water-bottles#:~:text=Skipping%20Rocks%20Lab%20uses%20a,water%20or%20any%20other%20liquid. https://www.dezeen.com/2019/04/29/london-marathon-ooho-edible-drinks-capsules-seaweed/	Edible water bottles: • Scientists have found a way to extract the congealing agent inside seaweed and use it to create edible water bottles • A commonly used culinary technique called spherification was the inspiration for this edible water bottle that was first commercialized by a company called skipping rocks lab and is called the Ooho water bottle • Basically what happens is that a compound called sodium alginate and calcium chloride are mixed together until a see-through membrane is created that can encapsulate water or any other liquid. • The skipping rocks lab found a way to mass-produce these bottles in order to make several thousand of these water bottles whose capacity ranges from 50 ml to 250 ml • The hydration is best suited for big music festivals, sports events, and small scale street businesses • You can either eat the water bottle whole after peeling the biodegradable safe skin or you can bite a hole through the membrane and drink the water • The entire product is biodegradable as it uses the same components found in seaweed • Also, it only costs 2 cents to create the water bottle thus it is very cost-efficient as well • Recently, the London marathon famously replaced most of the plastic water bottles being passed around for the Ooho edible water bottles. Over 30,000 bottles were passed around and the bottle was a huge success • This solution will eradicate the need for plastic bottles and will mean our air and oceans will be cleaner, and that marine life like fish won't have to die of plastic pollution as it does currently

Product Description:

1. Juice bubbles

An edible water bottle is created from sodium alginate and calcium lactate and water. Replacing water with juice results in edible juice bottles. These two ingredients are simply mixed and shaped to create a sealed bubble in which juice is encapsulated. When the bubble is placed into your mouth, the juice bubble will dissolve displacing juice.

2. Water bubbles (Potential further product)

An edible juice bottle created from sodium alginate and calcium lactate like above can be made into edible water bottles as well. Sodium alginate and calcium lactate are simply mixed and shaped to create a sealed bubble in which water is then placed. When the bubble is placed into your mouth, the water bubble will dissolve, displacing water

3. Cling wrap (Potential further product)

This is a cling wrap made to serve as a healthier alternative to plastic film wrap. Made up of the exact same ingredients that make up the water bubble which is sodium alginate and calcium lactate. The cling wrap can be used to cover food so as to not attract animals and to wrap food up for storage and then further consumption. Cling wrap has many uses and this environmentally friendly alternative definitely is worth buying.

Stakeholder charts:

Key Stakeholders		
Stakeholder	Relationship	Relationship building idea
Nist	Nist parents, students, etc. They are the main people who are buying our products. Also for selling our products and spreading the word	Selling and showing that our products save plastic use
Plastic Free Nist	We are trying to keep people from using, then wasting plastic bottles	Showing that our product makes less plastic waste
Rooftop Garden	Grow fresh fruits to make more juice for our products	Use their fertile grounds to help us with fresh fruits
Online shop	Sourcing ingredients from local vendors in Thailand	Use their market to source our ingredients for the blobs

Negatively Impacted Stakeholders		
Stakeholder	Relationship	Conflict mitigation idea
Ooho	They created the first prototype of an edible water bottle	Potential global competitor
Tipco	They are juice competitors in our school who sell juice	Potential local competitor
Minute Maid	They are juice competitors in Thailand who sell juice	Potential local competitor
Chabaa	They are juice competitors in Thailand who sell juice	Potential local competitor
Malee	They are juice competitors in Thailand who sell juice	Potential local competitor

Psychographics and Demographics:

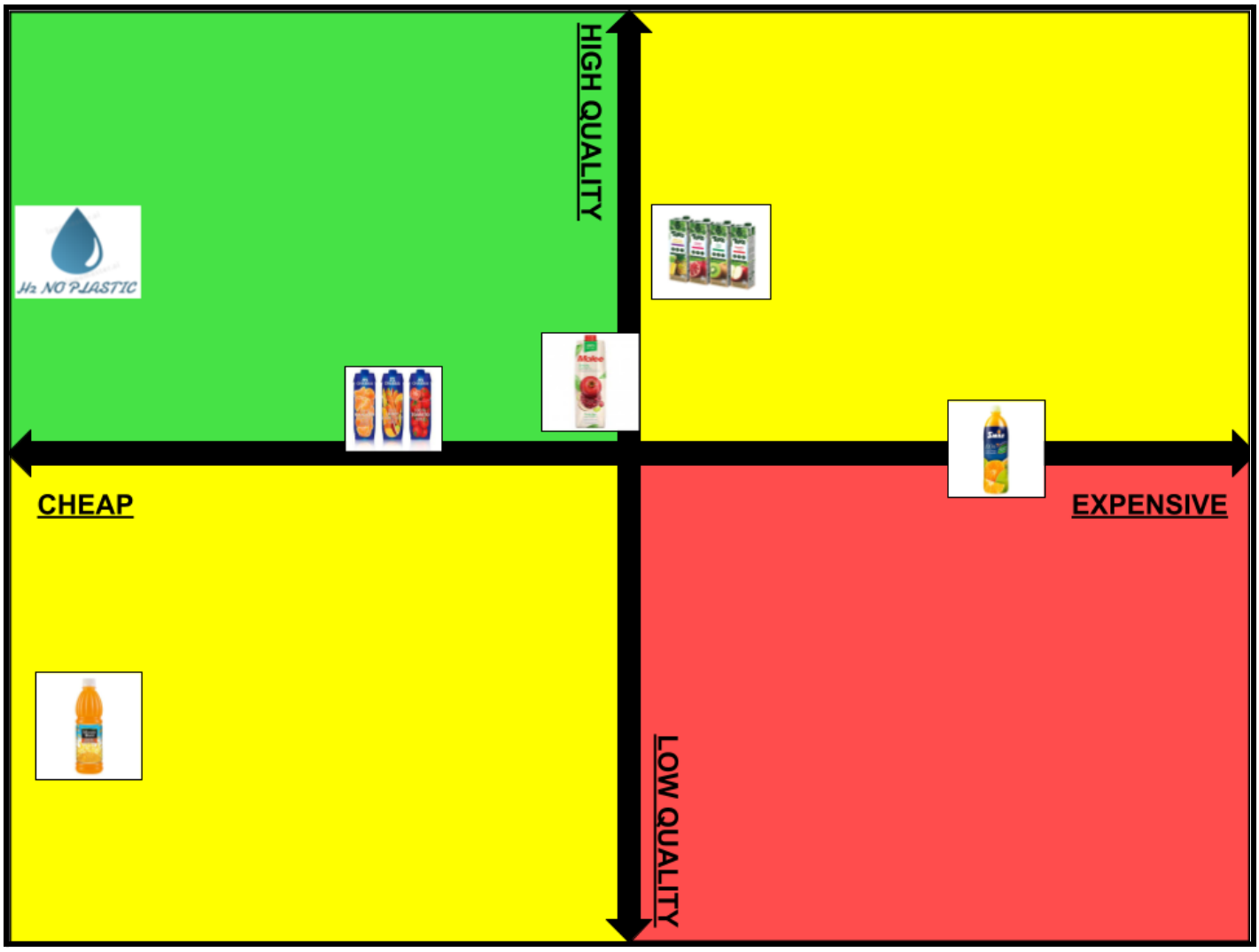
Demographics

Our market research has shown us that gender doesn't matter on this occasion. The only thing we are doing is selling juice and that can be enjoyed by all genders. Statistically speaking males enjoy more juice than females but the male population is larger than the female. The age group that we are targeting is anyone with an eye for colorful colors. Our edible water bottles aren't with water but instead juice giving it a popping look. It easily catches the eye of others and is able to draw attention from the crowd. This mostly draws out younger students who enjoy juice and vibrant colors. In order for us to have an income will be for us to sell 19 boxes of edible water bottles. Anything past this is profit which will be given to another service group or placed into helping develop our social enterprise. Our location at first will be at our school (NIST International School of Thailand) Once we earn more money we will expand to local shops and sports events provided by ours and other schools. Realistically this will help not only us but to a larger square all of Bangkok because the plastic pollution in Bangkok is a major issue and this can solve it.

Psychographics

Our target customers' interests are trying out edible water bottles. You are unable to buy this in Thailand unless you order in bulk from America or create it on your own. Our customers want to help prevent the use of plastic and enjoy the taste of juice. Also, they look for a clean and hygienic product. Our product meets our customer's needs because we provide all of this. We use different ingredients but never plastic. Everything we use is biodegradable or recyclable. Our product is made from juice and also very hygienic. This is because they are freshly made and then kept in clean cups which are washed before usage.

Product Perception Map:



Brands	Price per ml
Tipco 	0.09 baht per 1 mL of juice
Ooho 	Not shown
Minute maid 	0.05 baht per 1 mL of juice
Chabaa 	0.06 baht per 1 mL of juice
Malee 	0.08 baht per 1 mL of juice
Smile shogun juice 	0.1 baht per 1 mL of juice

H2No Plastic 	0.03 baht per 1 mL

Competitor analysis:

Name	Price per unit	Sustainable?	Where is it sold?	Influence on the market	Where is it advertised?
Tipco 	18 baht per 200 ml unit	No. Uses plastic layered packaging which is detrimental to the environment and health	NIST and across Thailand in grocery shops like tops, Big C, and Tesco Lotus. Also in Tipco foods	Very influential. Many people in Thailand buy this product.	In grocery shops, official site, and Facebook
Ooho 	Not shown	Yes.	Globally online but mostly in western countries.	Not too much influence as it is hard to buy it off of them.	Official site
Minute maid 	18 baht per 335 ml unit	No. Uses plastic bottles for packaging juice which is bad for the environment and health.	Across Thailand in grocery shops like tops, Big C, and Tesco Lotus	Quite influential. A lot of people buy this product in Thailand but not at NIST.	In grocery shops, official site, and Facebook
Chabaa 	62 baht per 1000 ml unit	No. Uses plastic layered packaging similar to Tipco which is detrimental to the environment and health	Across Thailand in grocery shops like tops, Big C, and Tesco Lotus	Moderately influential and has a global market. People do buy Chabaa but opt for Tipco juice instead normally.	In grocery shops, official site, and Facebook

Malee 	16.7 baht per 200 ml unit	No. Uses plastic layered packaging similar to Tipco which is destructive to the environment and to health	Across Thailand in grocery shops like tops, Big C, and Tesco Lotus	Moderately influential and has a global market. People do buy Malee from time to time but opt for Tipco juice.	In grocery shops, official site, and Facebook
Smile shogun juice 	102 baht per 1000 ml bottle	No. Uses plastic bottles for packaging juice which is bad for the environment and health	In a select few grocery shops such as CP fresh mart.	Not too influential as it isn't known as much and the juice isn't as widespread.	In online shops and in some grocery shops.

Financial analysis and Break-even point:

Table 1: Variable Cost

Variable Cost Table				
Product	**Cost (per specified Quantity)**	**Quantity**	**Production Capability (# of juice boxes) per quantity not implications of other variables**	**Cost for 1 juice box* (Cost/Production Capacity)**
Calcium Lactate (E-327)	65	100 grams	44	1.477
Sodium Alginate (E-401)	102	100 grams	160	0.6375
Cardboard Box	108	50 boxes	50	2.16
Mango Concentrate	64	1 Liter	533.333	0.12
TOTAL COST FOR 1 BOX				**4.3945**

*The cost per product is the entire product itself. The product includes 3 bubbles contained in a small cardboard box. So, when the title of the table calls for how many bubbles it can make, it accounts for 3 bubbles inside of a cardboard box instead of a singular bubble.

Table 2: Fixed Cost

Fixed Cost Table	
Product	**Cost (per specified Quantity)**
Drinkable Water	0* Water is free
Salary of Entrepreneurs	10 Baht per day x 4
Kitchen	0
Mold	0

Table 3: Total Deficit (Current)

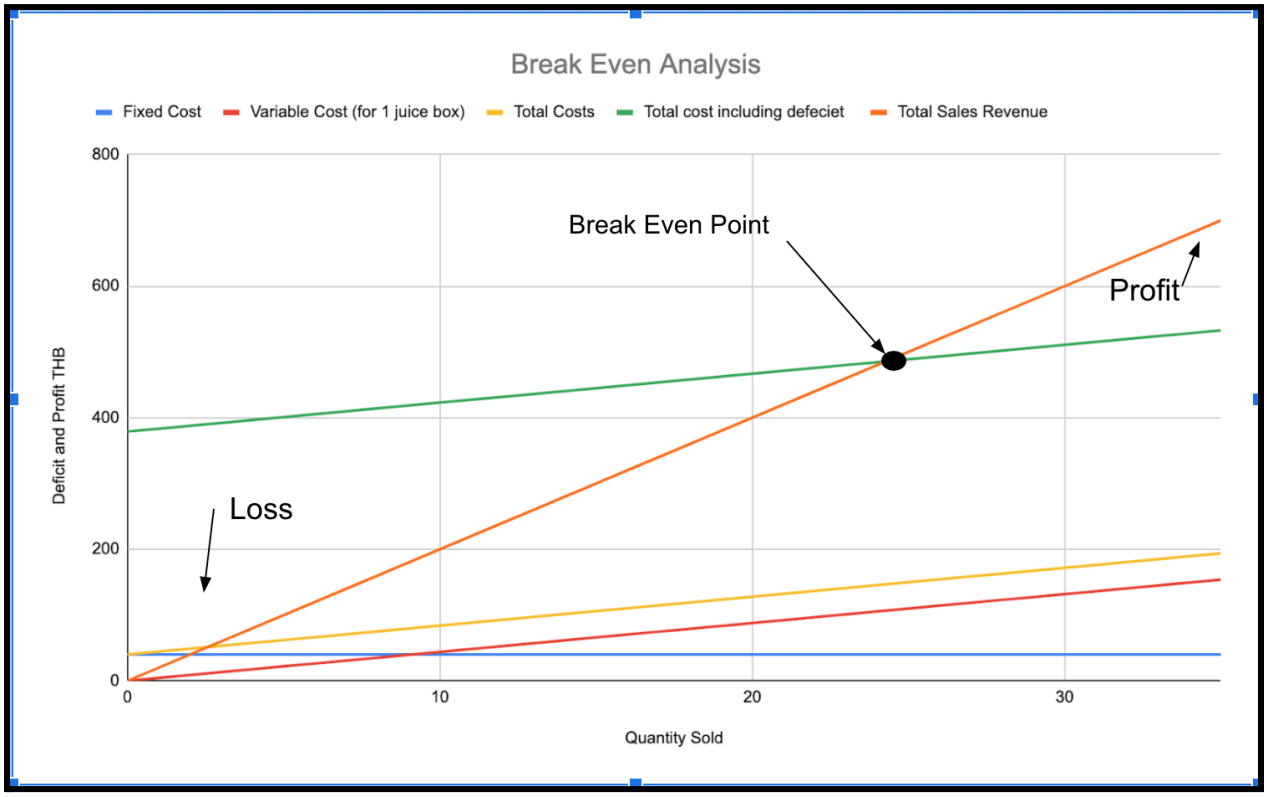
Current Total Deficit	
Product	**Cost (per specified Quantity)**
Calcium Lactate (E-327)	65
Sodium Alginate (E-401)	102
Cardboard Box	108
Mango Concentrate	64
TOTAL	339

Table 4: Break-Even Analysis

Quantity Sold	Fixed Cost	Variable Cost (for 1 juice box)	Total Costs	Price	Total Sales Revenue (price X quantity)	Total cost including deficit	(Loss)/ Profit TS-TD= (Loss)/Profit
0	40	0.00	40.00	20	0	379	-379
5	40	21.97	61.97	20	100	400.9725	-300.9725
6	40	26.37	66.37	20	120	405.367	-285.367
7	40	30.76	70.76	20	140	409.7615	-269.7615
8	40	35.16	75.16	20	160	414.156	-254.156
9	40	39.55	79.55	20	180	418.5505	-238.5505
10	40	43.95	83.95	20	200	422.945	-222.945
11	40	48.34	88.34	20	220	427.3395	-207.3395
12	40	52.73	92.73	20	240	431.734	-191.734
13	40	57.13	97.13	20	260	436.1285	-176.1285
14	40	61.52	101.52	20	280	440.523	-160.523
15	40	65.92	105.92	20	300	444.9175	-144.9175
16	40	70.31	110.31	20	320	449.312	-129.312
17	40	74.71	114.71	20	340	453.7065	-113.7065
18	40	79.10	119.10	20	360	458.101	-98.101
19	40	83.50	123.50	20	380	462.4955	-82.4955
20	40	87.89	127.89	20	400	466.89	-66.89
21	40	92.28	132.28	20	420	471.2845	-51.2845
22	40	96.68	136.68	20	440	475.679	-35.679

23	40	101.07	141.07	20	460	480.0735	-20.0735
24	40	105.47	145.47	20	480	484.468	-4.468
25	40	109.86	149.86	20	500	488.8625	11.1375
26	40	114.26	154.26	20	520	493.257	26.743
27	40	118.65	158.65	20	540	497.6515	42.3485
28	40	123.05	163.05	20	560	502.046	57.954
29	40	127.44	167.44	20	580	506.4405	73.5595
30	40	131.84	171.84	20	600	510.835	89.165
31	40	136.23	176.23	20	620	515.2295	104.7705
32	40	140.62	180.62	20	640	519.624	120.376
33	40	145.02	185.02	20	660	524.0185	135.9815
34	40	149.41	189.41	20	680	528.413	151.587

Graph 1: Break-Even Analysis



**To clarify confusion on the total deficit and total cost. The total cost has been calculated to be the cost it takes to create a single juice box (one of our products). However, this differs from the total amount of money we have spent on the creation of these products as the number of bubbles that each product can make is different so there are leftovers that cannot be accounted for. So, instead, there are total costs including deficit (including all of the cost) as well as the total cost.

Product pricing:

Looking at the breakeven analysis and the rival companies that are selling in NIST right now, the product will be priced at 30 baht per bubble. Our revenue model for this enterprise is to buy our ingredients and then sell them at a markup for profit. Basically, we will need to sell more units in order to breakeven and further make a profit. Our total expenses are 380 baht in total in order to get all of our ingredients. After calculations, we have found that the total expense we have for each of our juice packages is around 4 baht. So with a huge 750% markup, the retail price is 30 baht, close to other prices of juices sold around NIST. This would make our profit margin 26 baht. We would need to sell at least 25 packages to break even with costs and have an ROI.

Hygiene:

In order to make the product safe to consume and hygienic, multiple tactics will be employed in order to ensure the well-being of the user. Firstly, during the whole way of the production, gloves will be used and regular hand washing will be needed. Secondly, Face masks will be employed and long hair will be tied up. Next, all of the ingredients that will be used must be food grade in order to prevent it from being toxic for users. Finally, the bubbles will be packaged in a bio-friendly package in order to prevent the accumulation of dust and biohazardous particles on our product.

Closing Paragraph:

This product is very important and will create a safe, environmentally friendly, alternative to plastic packaging. This is important as there is the utmost need to save our oceans. Many competitors of ours in the juice industry are using plastic packaging as a means to contain their juice. This means that when these juice bottles are used up, most of them are being thrown away into the ocean or around the environment, releasing dangerous toxins. Investing and supporting this business would result in both saving the environment and giving the world access to this fun, tasty, creative, and sustainable juice bubble.

Packaging Ideas

- Egg shell types packaging where the packaging resembles an shell that can open and close
- Egg cartons with beeswax wrap wrapped around i

We created an edible water/ juice bubble that encapsulates a liquid inside of it. It is made of compounds that are extracted from algae which is mixed with a calcium compound to create a semi-permeable membrane, The membrane is biodegradable if the user chooses to throw it out and works towards eventually nullifying the effect of plastics and other non-biodegradable packaging on our planet. We focused on primarily SDGs 12, 13, and 14 which are all connected to the improvement of the environment around us. We have been successful in creating, marketing, and distributing our product to many members of the community inside our school as well as outside. We also look forward to supplying larger scale events such as marathons with our bubbles to reduce the environmental impact by our community on the environment. Since the threat of climate change can’t be ignored, this group is a progressive step.