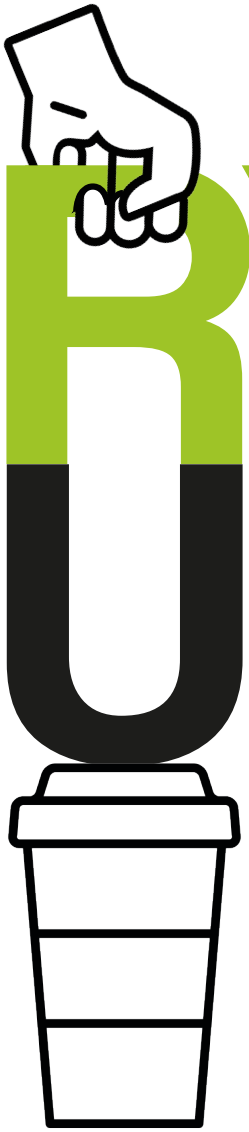
CARRY COLUMN



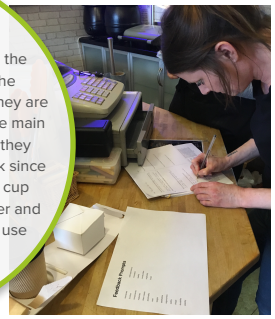
A2 PRODUCT DESIGN F523
MAKE AND EVALUATE

AMELIA CHERRILL 3036
CENTRE NUMBER - 62451

BRIEF / BACKGROUND INFORMATION

CLIENT & CONTEXT

Pamela Barrie - owner of Salvador's Deli (Wallingford) – a delicatessen style restaurant which offers light lunch, salads, sandwiches, coffee and cold drinks and bakery items with the option for these to be takeaway. Currently, Salvador's Deli uses paper bags in order to carry takeaway meals, however they are finding this method is becoming more and more impractical, especially when customers order drinks as well since they cannot be placed into the bag without being unstable and so have to use both hands to carry their order. The intended market place for my product will be relatively small scale restaurant/café companies who offer a takeout service to their customers. Another issue with 'traditional' paper bags is that they make for a lot of wasted space, which also means wasted materials.



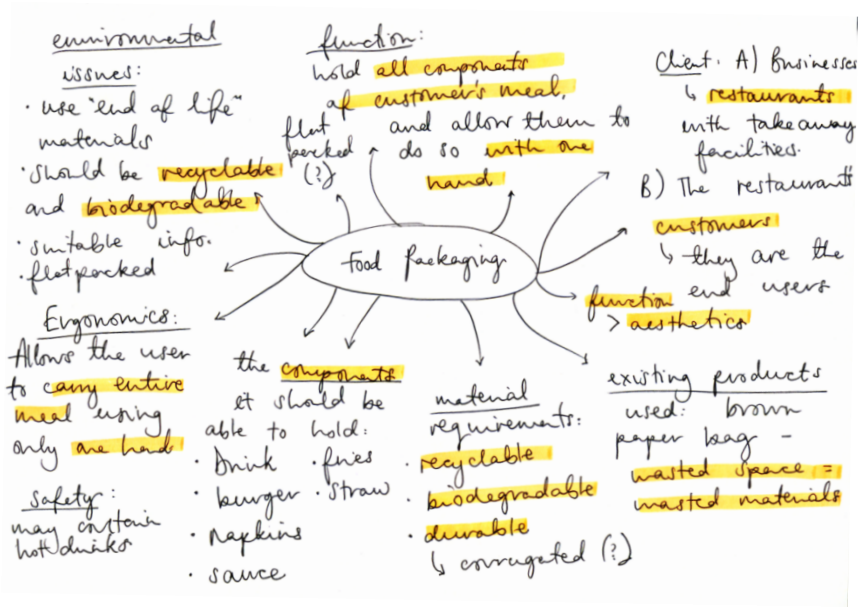
Client's Thoughts

"At the moment we are using basic brown paper bags, we like the aesthetic and functionality of the product, however at 30p per bag they are relatively costly and have flaws. The main problem customers face is when they purchase food as well as a hot drink since they aren't able to put the drinks cup inside the bag without it falling over and spilling, this means they have to use both hands to carry their food."

BRIEF

I will be designing, modelling and making an innovative alternative to a traditional paper bag that will be used to carry takeout food and drink. It will have separate compartments and holes for each necessary component (eg drinks holder, straws, sandwiches, baguettes, salads, wraps, cutlery, etc), as well as a handle –allowing the user to carry their entire meal using only one hand, keeping the other free.

BRAINSTORM



KEY ISSUES

Ability to hold significant weight – the holder must hold its shape and not collapse in on itself once all the compartments have been filled, this will mainly depend on the material

Food / Drink spill resistant – if any food or drink substances were to leak onto the container the material must not absorb it as it would weaken its strength

Ability to hold multiple components – although it would be difficult to design a holder which could carry every potential combination of food/drink order, it is important the holder has a significant degree of flexibility to adapt to the user's order

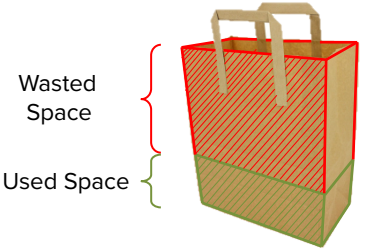
Dimensions – the holder should be larger enough to fit all of the components in it should not be so large it becomes difficult for the user to carry with ease

MARKETING

It in order to make it marketable the product should be commercially viable for the company. Since this is not a product that will be purchased by a customer, instead it will be given to them to hold you goods they have purchased, and so it needs to be worthwhile for the company to purchase. It will need to be mass bought and no profit will be gained from it – essentially we need to make an 'unnecessary' product desirable.
The carrier should be mass produced, as it is likely it will be mass or batch bought by retailers. This means it needs to have a low retail price, and in turn a low manufacture cost. This will influence the design and materials chosen, in order to create the largest profit possible.

PRODUCT PROBLEMS

The main issue with the current bags Salvador's use is the wasted space and material, as well as the fact you can't put a drinks container in the bag as it will likely fall over. My design should use as little material as possible, and make the best use of the space created. The holder should have a designated area for a drinks container, meaning the customer can carry their order with one hand



The type of brown paper bags Salvador's currently use, bought at 30p per unit

Below is some sample packaging ("specials box", small paper bag, hot drink cup and x4 drinks holder) from Salvador's. It is evident they all follow the same aesthetic - brown and eco-friendly without much branding. I will strive to make my product fit their scheme - however it's important to remember that it should be adaptable to more than one brand

INFORMATION, INSPIRATION & INFLUENCES { FIRST HAND RESEARCH }

Photographs taken by me when I visited Salvador's Deli, Pret-À-Manger and Starbucks

Large salad box from Salvador's Deli, Wallingford – leaves, 6 salad items plus a topping (eg chicken). Each customer chooses their own fillings from a fresh daily selection. The box is made from brown card lined with a water resistant protectant to try and prevent leaks however since some of the ingredients are relatively oily, some damage occurs occasionally

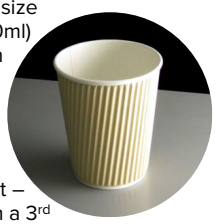
Branding on both the holder and the cups to create a house style

A hot drinks carrier which held two medium sized coffees

This hot drinks container also has a slot for a nap-kin. Would be good to have specific room for all meal "supplies" – straw, cutlery, salt and pepper, etc

A ready-made salad from high-street café Pret à Manger. The majority of space is taken up by the acetate window, the rest is used for branding purposes

Small hot drink cup size (350ml) from the Deli



Standardised component/ bought in part – supplied from a 3rd party in a standard size

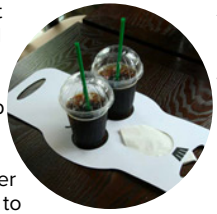
Deli Salad

The box has no closing mechanism, resulting in the lid opening off lots of the time – not good for transport

The brown paper bag supplied when you purchase from the deli – end of life, recyclable, biodegradable

The paper bags the deli supply with their salad boxes tend to tear if the salad leaks through meaning they become unusable very quickly – if they were more durable they could be reused

The double drinks holder when opened up flat would sit nicely on top of a work counter ready to be used



Avocado and crayfish salad from Pret à Manger® pre-made acetate front panel for customer to view product contained inside

A singular drink holder. The white material provides a good background for branding, however the environmental implications would be greater

Graze boxes are delivered to my house on a regular basis, full of healthy snacks

Inside of a Graze® Box – they contain 4 healthy "Pods" made of plastic – recyclable in some areas

KEY POINTS TO USE IN MY DESIGN

1

Have certain areas dedicated to a specific component of the meal - i.e. a slot for napkin, a space for knife and fork, etc.

2

Incorporate an acetate 'window' in the salad box, in order to allow the customer to see the product contained within.

3

Ensure the material used is more durable than the current brown paper bag, this could be thicker card, or single (or double) wall corrugated cardboard.

4

Create a space at the bottom of the holder for a drinks contain to 'sit'. This will have to be used with a cup with tapered sides in order for it not to fall through.

5

Ensure both the holder and the salad box has a secure fastening, in order to make transporting the meal unchallenging

INFORMATION, INSPIRATION & INFLUENCES { FIRST HAND RESEARCH }

MATERIALS

CURRENT

Salvador's paper bags are currently made from Kraft Paper, which is a porous type of paper with high elasticity and high tear resistance, designed for packaging products with high demands for strength and durability. Normal Kraft paper is moderately strong and relatively coarse. It has high tensile strength. The grammage is normally from 40–135 g/m².

POTENTIAL

Single, or double walled corrugated cardboard. Corrugated packaging is a versatile, economic, light, robust, recyclable, practical and yet dynamic form of packaging. It offers tear, tensile and burst strength to withstand shipping pressures. Corrugated Board resists impact, drop and vibration damage and offers uniform stacking and weight distribution. Corrugated cardboard can be printed by Flexographic, lithography and silk screen.

Length x Width	Sheets Per Pack	Price Per Pack			
		1-5 Packs	6-17 Packs	18-35 Packs	36+ Packs
310 x 210 mm A4 size	150	£38.75 £0.26 each	£28.65 £0.19 each	£25.45 £0.17 each	£23.42 £0.16 each
420 x 300 mm A3 size	80	£26.90 £0.34 each	£23.85 £0.30 each	£20.80 £0.26 each	£17.95 £0.22 each
800 x 600 mm Half Europa size	40	£9.10 £0.23 each	£8.15 £0.20 each	£7.55 £0.19 each	£7.40 £0.19 each
1095 x 905 mm Full Container size	20	£13.65 £0.68 each	£9.10 £0.45 each	£7.90 £0.40 each	£7.75 £0.39 each
1200 x 800 mm Full Europa size	40	£20.30 £0.51 each	£16.85 £0.42 each	£14.50 £0.36 each	£13.45 £0.34 each
1200 x 1000 mm Pallet size	40	£25.20 £0.63 each	£21.05 £0.53 each	£18.17 £0.45 each	£16.96 £0.42 each
Length x Width	Sheets Per Pack	1-5 Packs	6-17 Packs	18-35 Packs	36+ Packs
		Price Per Pack			

www.kitepackaging.co.uk's price list for various sizes of single wall corrugated cardboard. Ranging from £0.19 for an A2 sheet.

ITEMS THAT COULD BE CARRIED IN THE HOLDER

CUP
12cm x 6cm x 6cm

STRAW
13cm x 0.5cm x 0.5cm

SALAD BOX
18cm x 12cm x 4cm

SANDWICHES
10cm x 11cm x 3cm

BAGUETTES
25cm x 6cm x 6cm

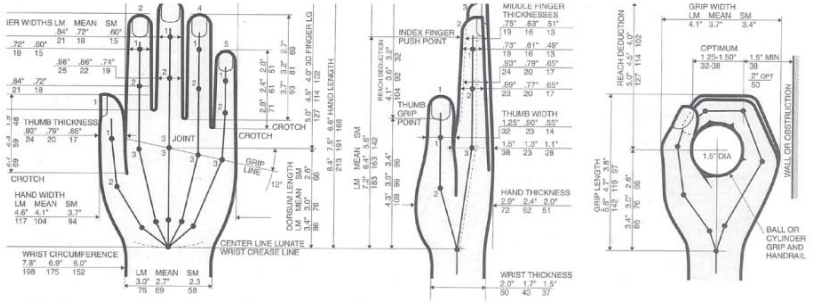
CUTLERY
2cm x 7cm x 0.3cm

NAPKINS
10cm x 10cm x 0.2cm

MARKETABILITY

Marketability refers to how viable and sellable a product is. To be successful, a new product has to fulfil and number of the questions below:
Does it have unique features? Your product has got to have a unique selling point (USP) to be able to make it in a crowded market. Does it have mass appeal? Is there a broad enough target market that people from all demographics will use it?
Does it solve a problem? If your product solves a function then it is likely to be a success since people are always trying to find ways to make their lives simpler.
Is it multifunctional? Does your product solve many problems at once?
With my product, it should be commercial viable for both independent retailers (Salvador's Deli) and big-name companies (Costa).

ERGONOMICS



Ergonomics is about 'fit': the fit between people, the things they do, the objects they use and the environments they live in. If good fit is achieved, the stresses on the body are reduced. They are more comfortable, they can do things more quickly and easily. As well as physical fit, ergonomics is also concerned with psychological and other aspects too. Which is why ergonomics is often called 'Human Factors'.
The ergonomic focus of my product will be its handle and how comfortable it is to carry.

INFORMATION, INSPIRATION & INFLUENCES { SECOND HAND RESEARCH }

Cup becomes handle

Corrugated cardboard is rigid and durable

Two flaps to secure handle

Single ply card is not as durable as corrugated cardboard

Folds act a as closing mechanism

Tabs act a as closing mechanism

Simple black on brown colour scheme - could be adapted to different clients

Interior divisions/ sectioning

Recyclable and biodegradable materials

Does not hold a drink securely

Uses two different materials (Kraft Paper and Cardboard)

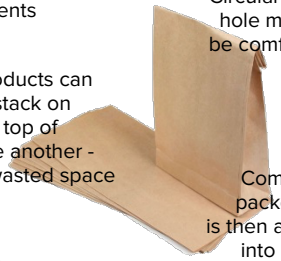
Still creates wasted materials

Roughly 20cm x 20cm x 20cm

Can hold multiple components

Strong octagonal base shape

Products can stack on top of one another - less wasted space



Circular handle hole may not be comfortable

Comes flat packed and is then assembled into shape

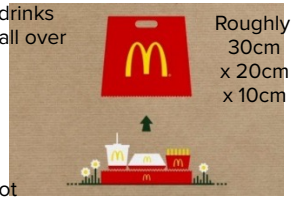
Folds up to create shape

Drinks are kept upright

Can be held with one hand only

Hot drinks may fall over

Should not contain any sharp edges



Roughly 30cm x 20cm x 10cm

Tears apart/opens out to create a placemat/dish

Folds onto itself to form handle

Strong triangle shape

Range of products/components

Packaging is formed around/using the product

Product sits underneath carrier - product edges would need to be tapered for this to work

Opens out to create a dish

End of life materials are cheaper than virgin materials, and more eco-friendly

Products stack on top of one another

Secured using a tie

Mono-chrome black and white colour scheme

Pressed cardboard can be recycled

Internal divisions allow for separation

Strong triangle shape

Internal holders - makes good use of the space

KEY POINTS

Incorporate the handle into the holder, so that it is all made from one piece- this will ensure it is strong and durable whilst being carried. This will also reduce the amount of different materials required.

Make the handles secure by using some kind of locking system made from part of the holder.

Use the holder to double as place mat / eating tray, for hygiene and conveince purposes

Make the salad/specials box fold out to create a bowl/plate eating surface.

Have a specific holder for drinks to keep them upright and stable

Possibly have internal separators to divide the inside a box

DESIGN SPECIFICATION

KEY POINTS

MAT 1
– should be biodegradable and recyclable in order to reduce the environmentally impact

MAT 2
– should be strong enough to withstand the weight of food whilst it is being transported (eg corrugated cardboard)

MAN 1
- the choice of material should lend itself to be easy the cut, shape, fold and print (lithography) onto

MOR 1
- the carrier should have minimal environmental impact - the 6 R's should be carefully considered throughout the product's life cycle

F 1
- the carrier should be quick and simple for the employee to construct from flat packed

P 2
– should withstand large quantities of weight without collapsing or breaking

P 3
– should be able to hold all components of a user's meal, meaning they only have to use one hand

MAT1

throughout the project I will make reference to spec points using the code, and highlighting it by using this green circle

ERGONOMICS

E1 - handle should be designed to suit all hand shapes and sizes to fit a range of customers
E2 - comfortable to grip and hold in varying positions and angles so the handle is always comfortable no matter which way you hold it
E3 - when the user is carrying the product with an extended arm it should not get in the way - it should not come down too low (past the knee) or be too wide (over 150mm) so it interferes with the users walking

MORAL ISSUES

MOR1 - the carrier should have minimal environmental impact - the 6 R's should be carefully considered (reduce, reuse, rethink, recycle, repair, refuse) throughout the product's life cycle (cradle to death - sourcing of materials, manufacture, transport, use, disposal, etc)
MOR2 - the materials sourced should be fair trade and come from workers who are paid well and treated ethically

AESTHETICS

A1 – the carrier should be minimal and simple
A2 – since the material used will be recyclable and biodegradable, it is likely it will be nearing the end of its product life cycle, meaning it will be brown (rather than white), this will make it have more of a natural aesthetic. It may also encourage the user to recycle the carrier
A3 - Matte finish (no money spent on additional textures)

MATERIALS

MAT1 – should be biodegradable and recyclable in order to reduce the environmental impact – the individual food containers/wrappers should also be biodegradable/recyclable (eg cardboard) in order to promote sustainability
MAT2 – should be strong enough to withstand the weight of food whilst it is being transported (eg corrugated cardboard) so that it does not collapse, spilling the customer's food and drink

PRACTICALITY

P1 – have a comfortable handle for the end user to carry their food with ease without pain
P2 – should withstand large quantities of weight (500g) without collapsing or breaking, in order to make sure the user's food is secure
P3 – should be able to hold all components of a user's meal, meaning they only have to use one hand, this may be done using different compartments/slots/holes etc
P4 - all the components should be securely held in place within the carrier

FUNCTION

F1 - the carrier should be quick and simple for the employee to construct from flat packed
F2 - the user should be able to undo and open to carrier and remove their produce with ease
F3 - the carrier should hold multiple components (eg drink, sandwich, salad, cutlery, napkins, etc)
F4 - the handle should be strong enough to support the weight of the food/drinks

MANUFACTURING

MAN1 - the choice of material should lend itself to be easy to cut (die cutting), shape, fold and print (lithography) onto in order to make manufacturing it simple and quick to complete
MAN2 - depending on whether the carrier will be sold to independent shops, or big name chain brands, the carrier will be batch or mass produced in order to produce as many as possible in as little time
MAN3 - dies could be used in order to speed up the manufacture process
MAN4 - ideally, the net for the carrier will tessellate, meaning less waste material

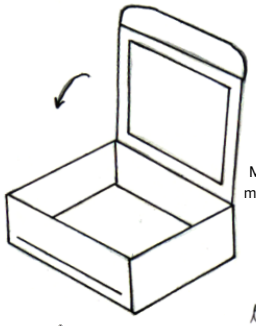
COST

C1 – the production cost should be as low as possible (less than 10p per holder) since the businesses will not sell the product onto the end user, instead simply give away with the price of the meal, and so the businesses will not want to purchase something with a high retail price, since they will not make any return on it
C2 - the retail cost may be higher to reflect the standard of material; biodegradable and recyclable

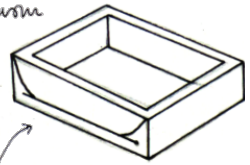
SAFETY

S1 – since the carrier may contain hot drinks it is important the bottom square panel is particularly structurally sound, since if it breaks it mean the user gets burnt
S2 - the carrier should be refined, without any serrated edges (particularly in the area surrounding the handle) as this may cause the user discomfort when using the carrier
S3 – the combined weight of the carrier with all the food inserted should not be more than 700g so that it does not break, potentially causing the user physical harm

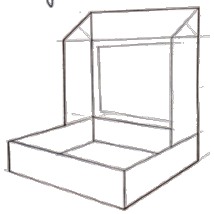
INITIAL IDEAS



easy to eat from

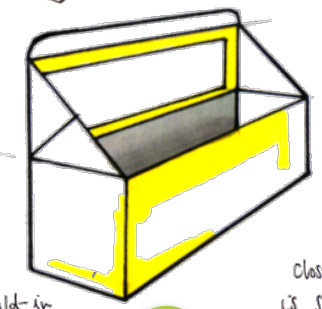


wide and flat / shallow



fold down to secure or use a folding mechanism

more reliable

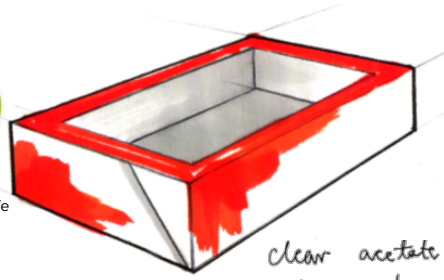


fold-in triangle tabs used for closure?

P4

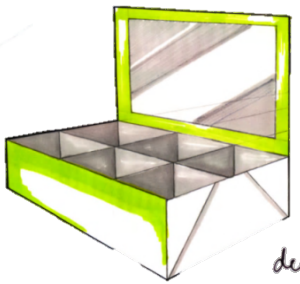
MAT1

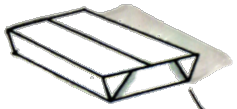
Made from 250 micron end-of-life card, which is recyclable



tabs fit into slits to create a closing mechanism

clear acetate film window in lid allows you to see product

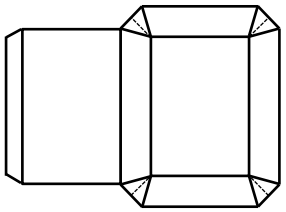




deep compartments

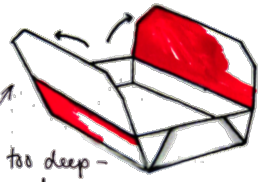
tapered edges

F1



"all in one" net method will hopefully prevent leakage through ajoining edges.

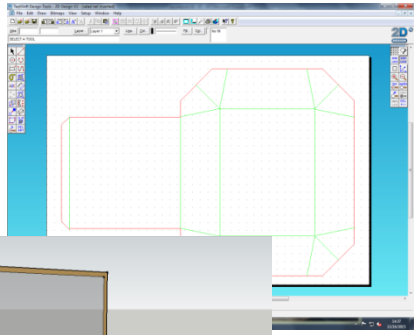
F2

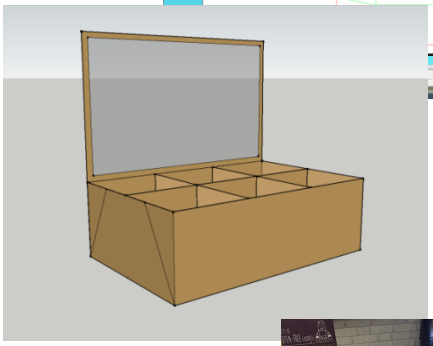


not too deep - flat and open, easy to eat from

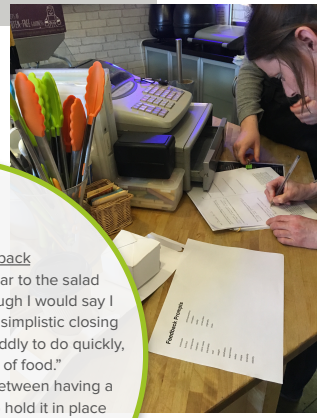
2-part fold in edges to create lid and locking system

Net showing basic cuboid with cut out in perspex for acetate sheeting





Not practical to eat from

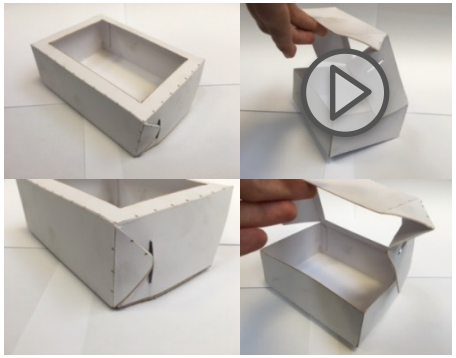


F1

Response to feedback

"Although it is relatively similar to the salad box we currently supply, although I would say I would prefer it to have a more simplistic closing system, as it is sometimes too fiddly to do quickly, especially when it's full of food."

It is difficult to get a balance between having a secure locking mechanism to hold it in place and not being too complicated to interlock quickly and easily.

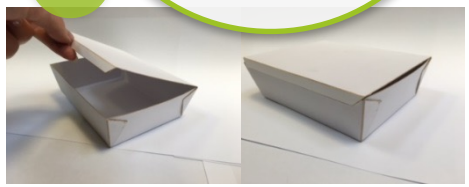


Card was too thick meaning closure was difficult

Closing system is secure, however it is fiddly and time consuming to do

a fair amount of excess card - could be reduced in order to save material wastage

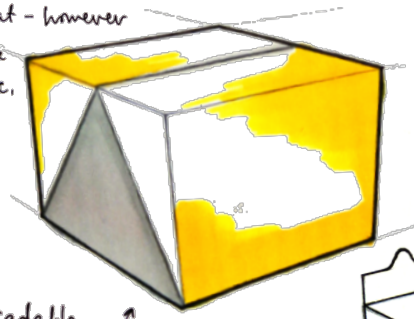
MOR1



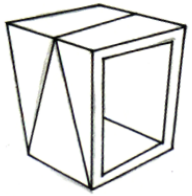
The first model did not have any kind of locking mechanism to keep the lid in place. This doesn't meet spec point P4, as it is likely that, with transport, the lid could become dislodged, resulting in the contents coming out

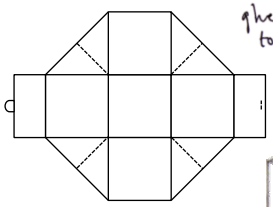
INITIAL IDEAS

Looks neat - however may not be very secure, but does it need to be?

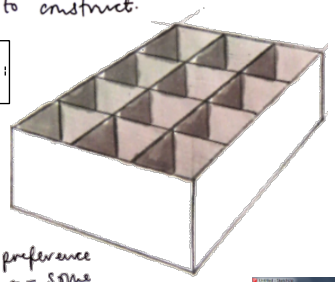


fully biodegradable

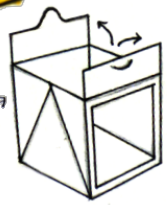




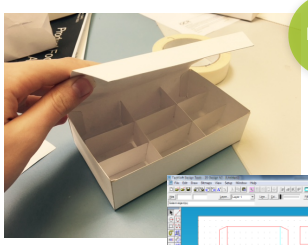
glue to required to construct.



one-sheet box net method means no 'gappy' edges - no liquid can escape

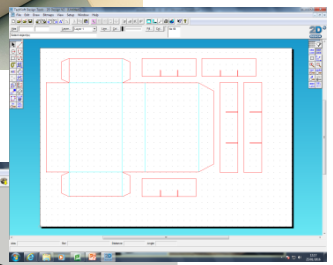


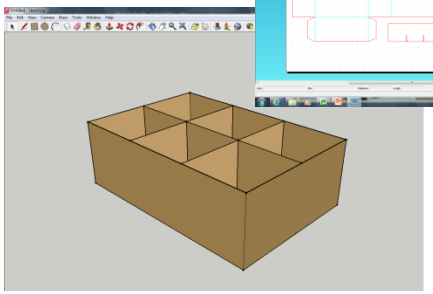
customer preference may vary - some won't want their salad separated into sections - optional/or/removable?



MOR1

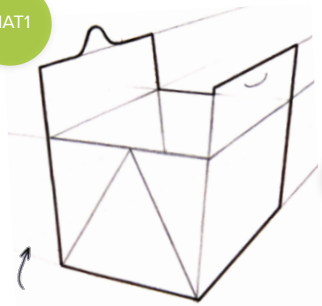
Separate components means excess wasted materials





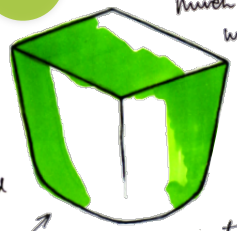
More material required will have a substantial economic impact (15p per unit)

MAT1



Small and compact.

MAN4



4 tabs inside opening - too much? excess waste mat.

Classic takeaway box shape - iconic for Chinese food

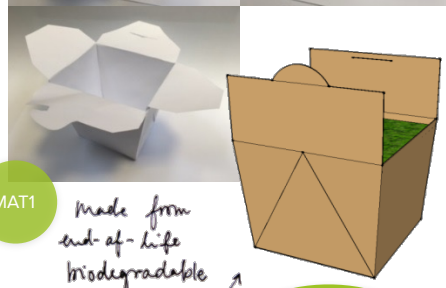
works for hot dishes - may be not salad? - too deep

Can be flat packed

circular fence - all-in-one net wouldn't work

tapered edges - easier to eat from

MAT1



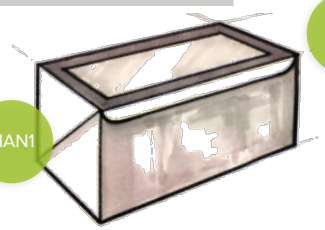
made from end-of-life biodegradable card

The 'salad bar' allows customers to choose 6 types of salad, plus leaves

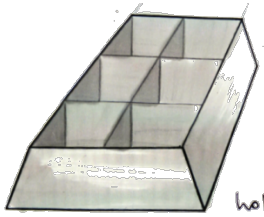
→ Separate Section for leaves?

C1

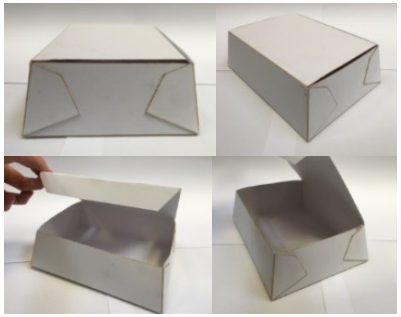
MAN1



Some customers may want their salad mixed up → option to remove?



fits into the contours of the holder



holds many components

Response to feedback

"I like the classic 'Chinese Takeout' design, however I think the scale would need to larger, to fit a more generously sized portion. Also, it would need some kind of waterproofed lining to prevent the card from disintegrating." I think both of these ideas would improve the carton's practicality greatly. This however, would have a high economic impact.

MAT2

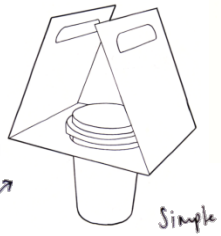
C2

The deli's "specials" box, compared to their salad box. The latter is shallower, and wider, making it more open and easier to eat form. The specials box also contains a waterproofed lining on its interior.

INITIAL IDEAS

MOR1

flat sheet folds to become drink carrier with handle

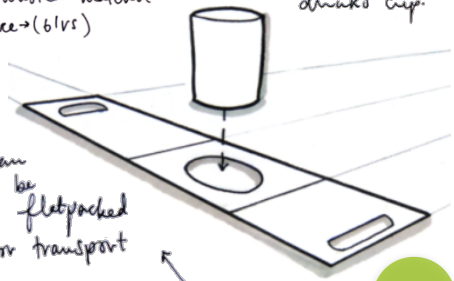


MAT1

Should be biodegradable - made from end-of-life cardboard (Recyclable)

little wasted space = little wasted material reduce → (6 lvs)

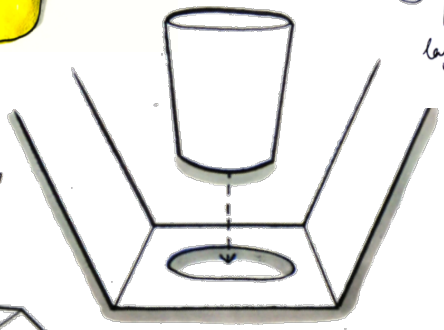
folds up through the drinks cup.



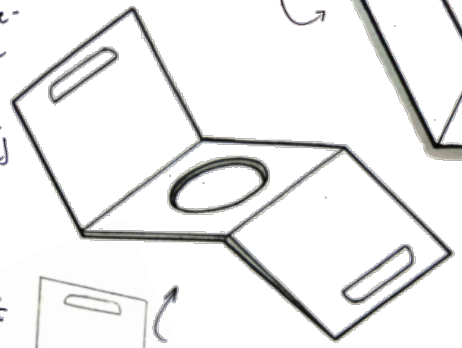
can be flatpacked for transport

holders can lay flat until needed

F1



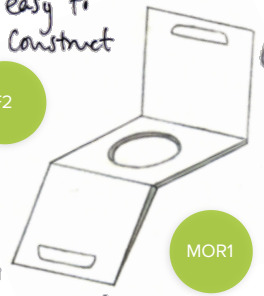
Simple to "construct" (place components in)



easily shaped / folded into the triangular shape - scoring may be required prior to construction

easy to construct

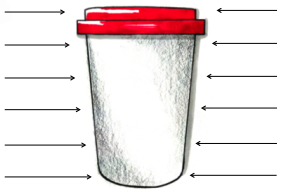
F2



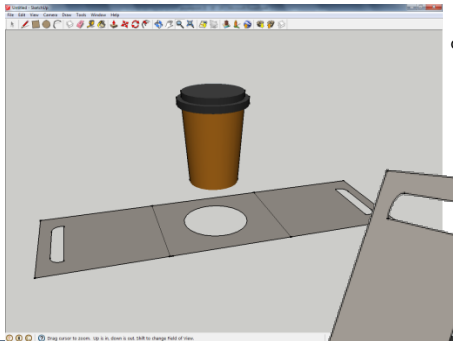
tri-fold sheet creates strong triangular shape

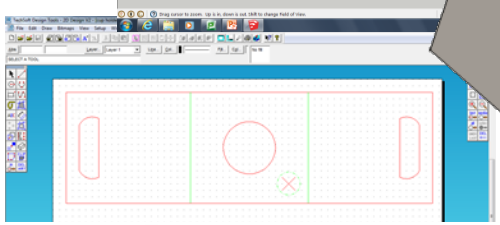
MOR1

can be reusable - bring back + get a reward?



In order for the cup to be suspended below the carrier, the edges need to be tapered





The holder lays flat on the counter (left), then folds up around the cup to form the carrier (below).

F1

P3

The deli currently provide customers with PotatoPak drinks holders (pictured) - they come in multiples to hold either two or four cups. This is a very durable and hard-wearing material, perfectly suited to its function - however, it may not be practical for my holder since it is not at all pliable or flexible. The other issue with this is that it only fits a small range of cup dimensions

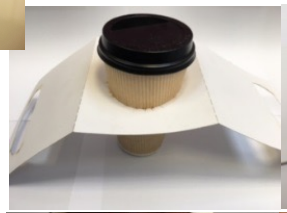
MAT1

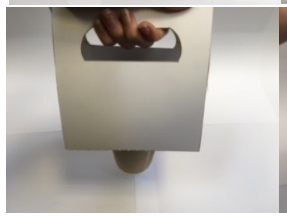
PotatoPak is made from potato starch. after use it can be composted or used for pig or worm food

slits cut so it can hold different sized cups without the need for a different product

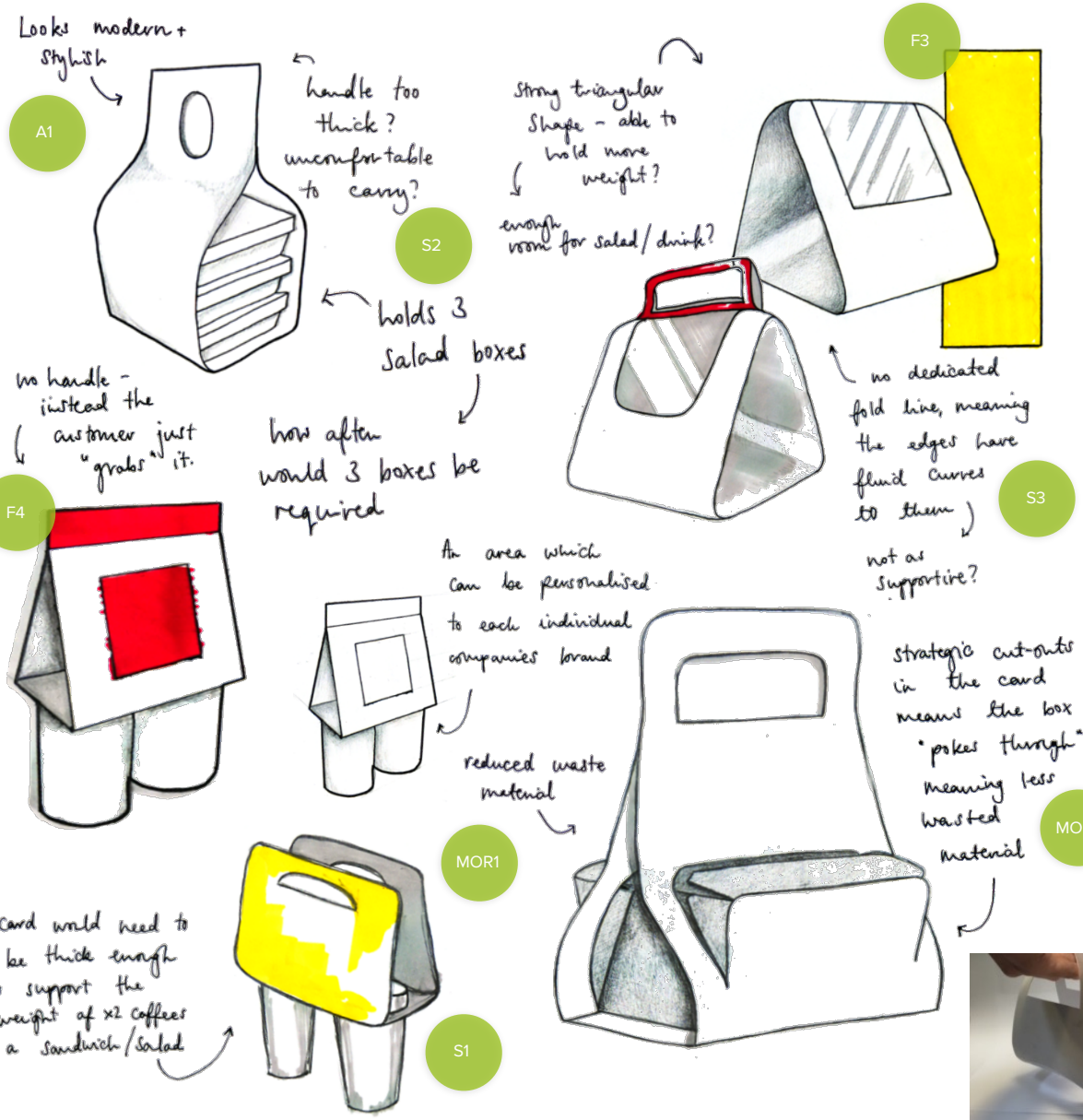
P4

space for cutlery to be placed in and held for takeaways

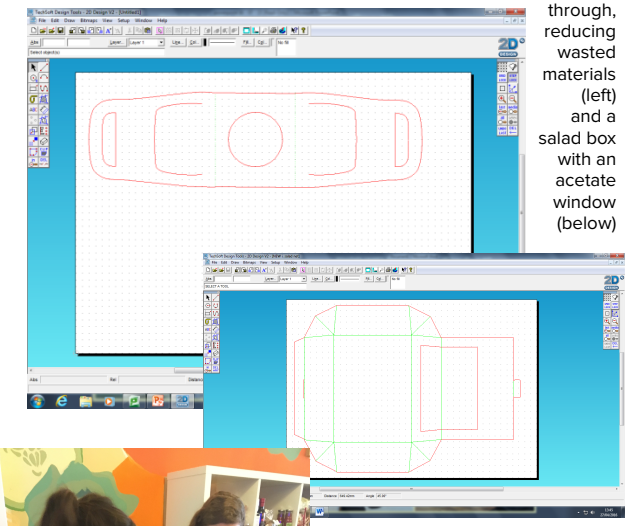


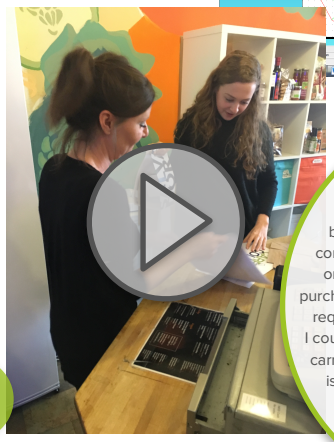


INITIAL IDEAS



Nets of the holder which allow the edges of the box to push through, reducing wasted materials (left) and a salad box with an acetate window (below)





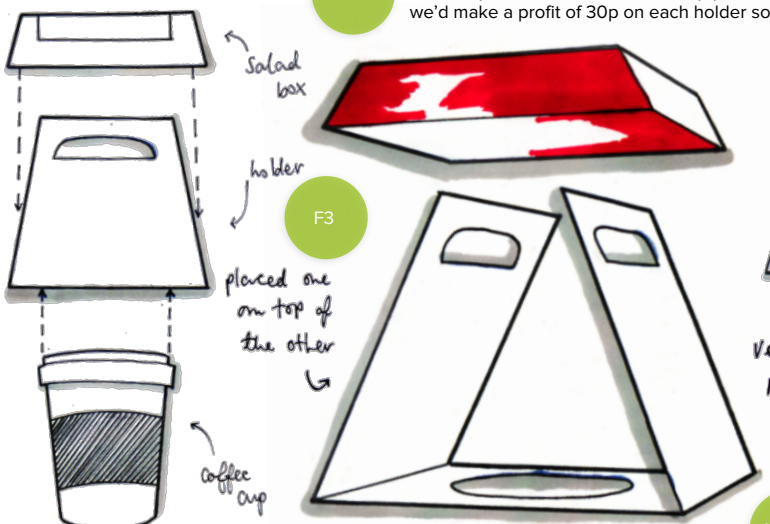
Response to feedback

"While the majority of our customers only buy one 'meal', many do buy multiples. My concern is that there is no way to fit more than one meal in a carrier, so even it you were to purchase more than one drink, you would instantly require two carriers, which would be unviable." I could add a "multiple" holder to the range which carried 2, or possibly 4 drinks at once. The main issue with that though would be the overall size of the holder as it would need to be very substantial.

DEVELOPMENT OF IDEAS

C1

The cost of producing this holder would be less than 10p, if we were to sell it at 40p per unit we'd make a profit of 30p on each holder sold



F3

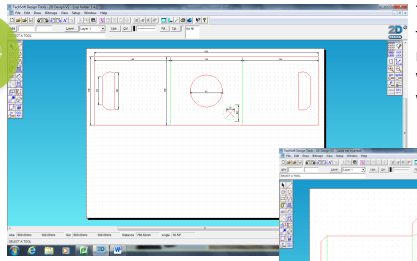
placed one on top of the other

very little material actually used

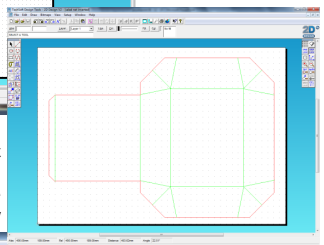
MOR2

will the heat from the coffee make the salad/ sandwich warm?

MAN4



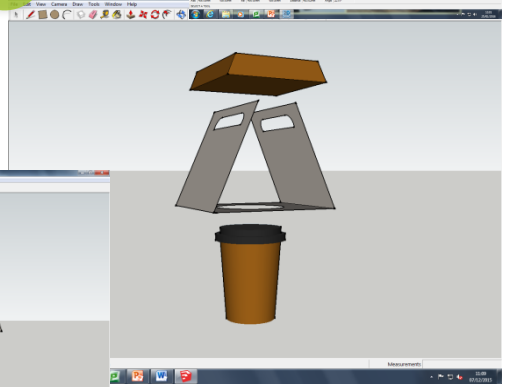
This net (left) tessellates, meaning less waste material will be produced

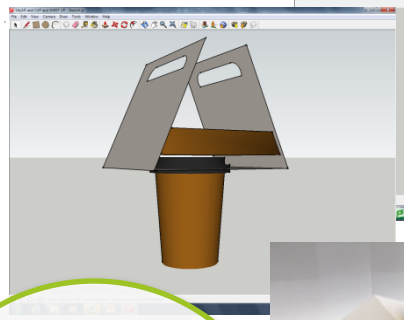


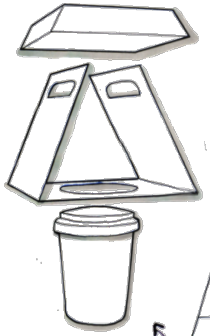
Net for a salad box, without an additional acetate window

MAT2

At least 300 microns thick to withstand weight of food

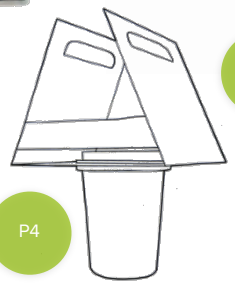






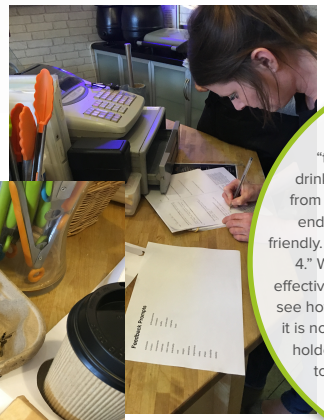
Coffee cup is placed in first, through the cut-out hole. Then the salad box is placed on top

F1



possibly need something to secure salad so it doesn't move around?

P4



Discussing the advantages and limitations of the PotatoPak holder with Pamela

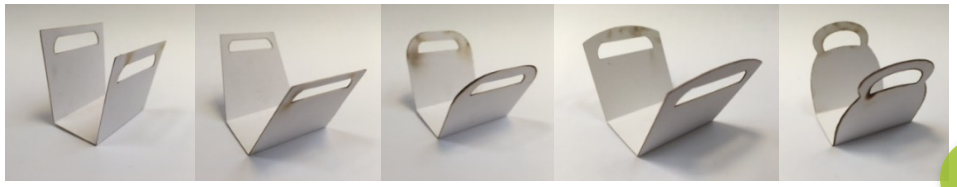
Response to feedback

"the material is not very durable" the drinks holders we have currently are made from PotatoPak, meaning they are both very enduring as well as being environmentally friendly. We have holders to suit both 2 drinks and 4." While I agree PotatoPak is an extremely effective material for this purpose, I am unable to see how I could incorporate it into my design as it is not at all flexible or modifiable. The current holder has the same issue of not being able to carry the full meal entirely with one hand.

MAT1

DEVELOPMENT OF IDEAS

holder body shape



Most basic design - square shaped, "straight up and down sides with full corners"

★★★

Trapezium shape – "slanted edges give a more stream-line and modern shape"

★★★★

Rounded trapezium – similar shape to the previous with a "softer look"

★★★

Rounded square – curved top edge, "would be more comfortable to carry compared to the plain square"

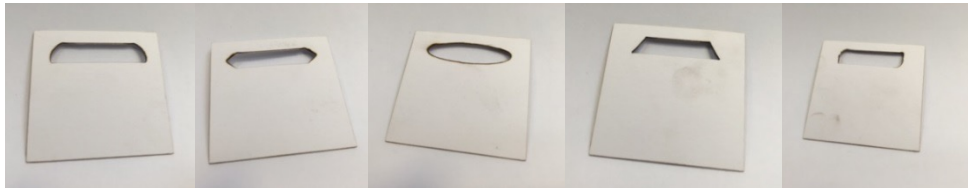
★★

"A fun, bouncy look. Some areas may be too narrow to cope with the pressure and stress exerted"

★★★★

MAT2

handle shape



Simple design with two full corners and two curved ones. "Would be relatively comfy to hold"

★★★

Hexagonal shape – "geometric feel is contemporary and unique comfort may be compromised though"

★★★★

Oval shape is "simple but classic", has a retro feel which doesn't really suit the brand's identity

★★★

Trapezium design is harsh and bold – "doesn't look as though it would be very comfortable"

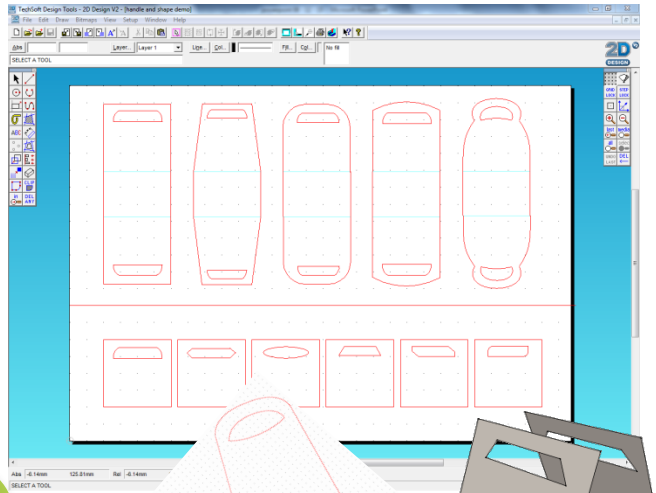
★★

Opposite rounded corners look "modern and sleek, it may not be as practical to hold as others"

★★★

A1

E2



S2

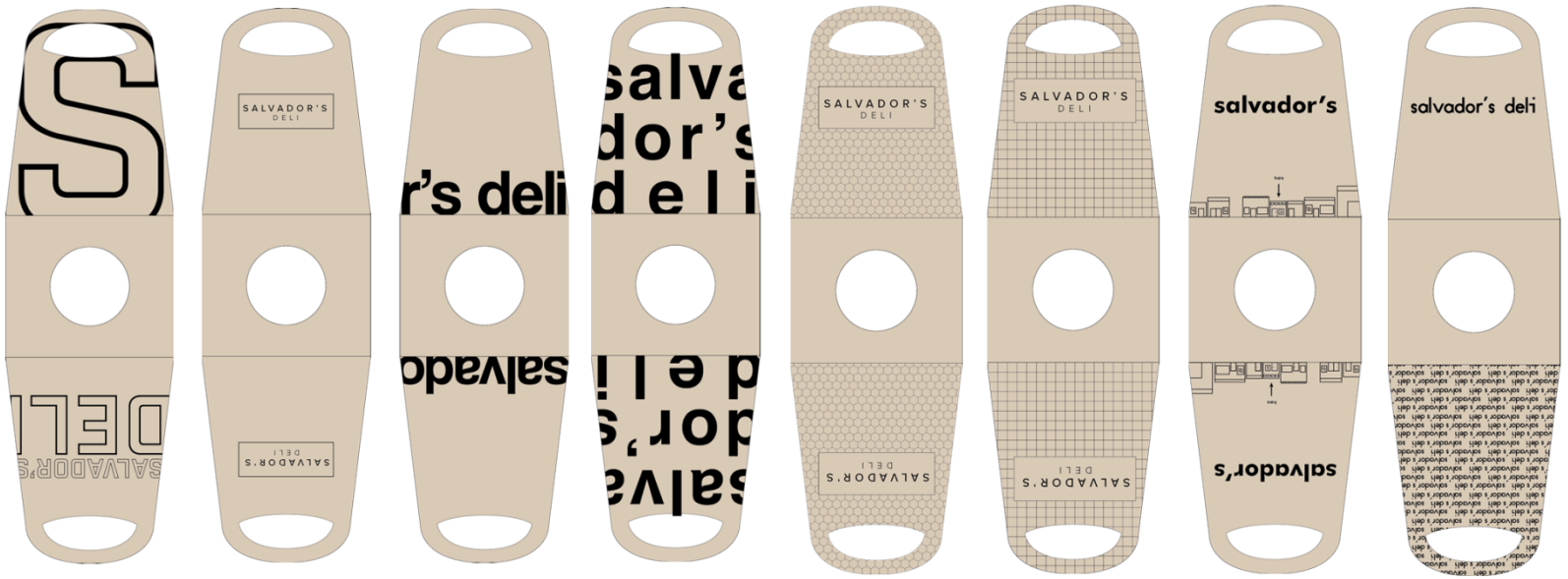
Response to feedback

The most voted for holder body shape was the 'bubble' shape - I think mainly because people said it was "fun and quirky", however there may be a practicality issue with this one, since its shape means there are there are very narrow areas which may have a tendency to break easily.

The most voted for handle shape was the simplistic oval shape - this was probably because it was though to be the most comfortable with smooth rounded curves.

I asked my class to vote on their favourite shaped holder and handles the photo shows their tally chart, as well as some of their comments on the left

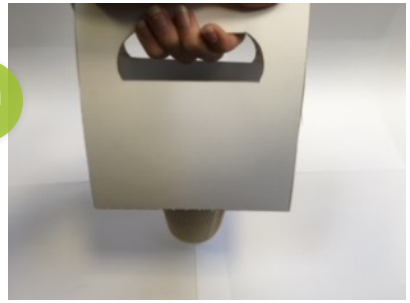
SURFACE GRAPHICS



Here are some example surface graphics I mocked up on Adobe Illustrator. This was the give the client an idea of the potential end design of the holder, as opposed to plain white. Of course, in industry, each holder could be customised to suit the needs of each individual client. They could pick their own colour schemes, fonts and art work to suit their brand identity. For Salvador's Deli I chose a neutral brown and black aesthetic. I experimented with pattern and text, as well as some imagery of the street on which it's located.

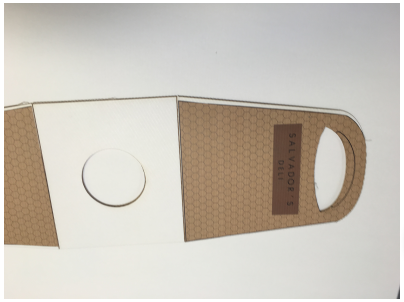
ISSUES WITH CURRENT DESIGN

MOR1



Too much wasted material and space - the design allows for the salad box to be flat and wide, however this is not the most economical way of using the space. It should be not so wide and taller. This may mean rethinking the shape of the salad box

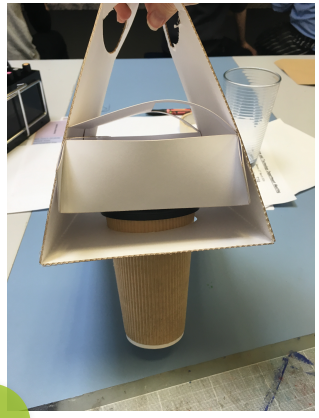
The overall holder is very boxy and bulky, not very streamlined and elegant. I think the idea of changing the shape to a taller and more narrow design will help to combat this issue



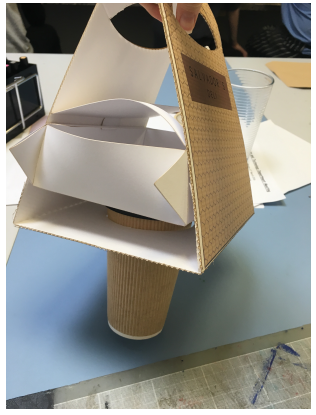
A2

Because of the computer aided manufacture processes we have at school, the only way to show a full size prototype means printing the surface graphics onto a separate sheet of brown paper then using spray adhesive to combine it with the corrugated cardboard

One of the issues that comes with this is that the surface graphics do not accurately line up with the cutouts in the holder. The simplest way to solve this is to remove any unnecessary guidelines (eg handle) and make the pattern spread all the way across the design - so it isn't noticeable if it does not correlate accurately



F3



E3

These photos also demonstrate the issue of the salad box's shape and dimensions. The box is too wide and the exterior angles are not steep enough. As a result of this, when the handles are joined, the box bulges and the top panel of the box opens, creating a wide gap. Not only this, but it also puts a lot of pressure on the handles, causing them to bend, making them less secure

IMPROVEMENTS AND MODIFICATIONS:

I am going to rethink the entire shape of the salad box - probably making it into a more upright, 'pot' like structure, rather than a flat 'tray'. This will allow me to adapt the shape and dimensions of the overall holder, in turn overcoming the issues of wasted materials and 'boxy-ness'. I will reconsider the shape of the sides of the holder, again trying to make them more aesthetically pleasing.

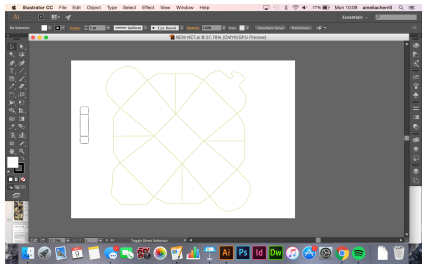
DEVELOPMENT OF IDEAS

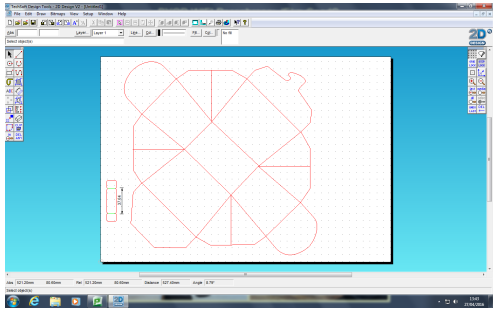
F2

locking mechanism should be easy to undo and open, but also hold the food securely

F3

This band - made from 350 micron card also - hooks onto part of the holder securing it in place and keeping it upright.





MAN1

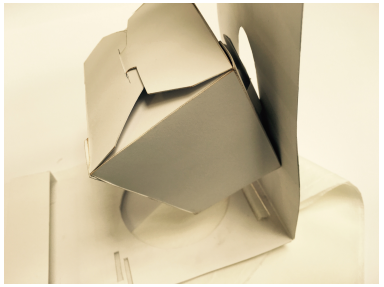
The retail price per unit may have to increase to reflect the quality and sustainability of the materials used (350 micron bio-degradable card)

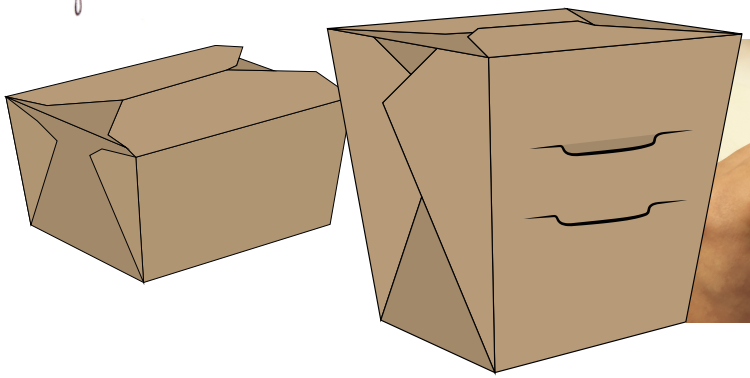
C2

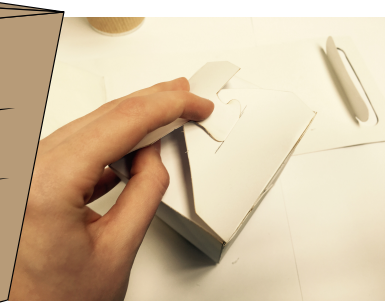
material used (350 micron card) should be easy to die-cut and fold- particularly since this is a fairly intricate design

dies could be used to decrease manufactive time.

MAN3

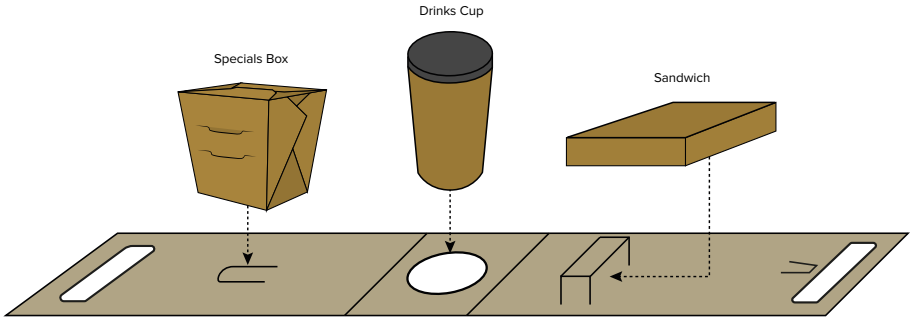


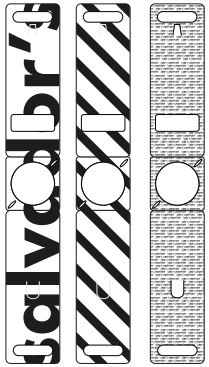




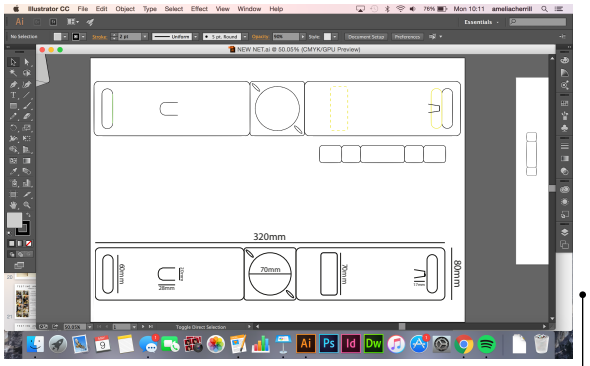
DEVELOPMENT OF IDEAS

FINAL DESIGN

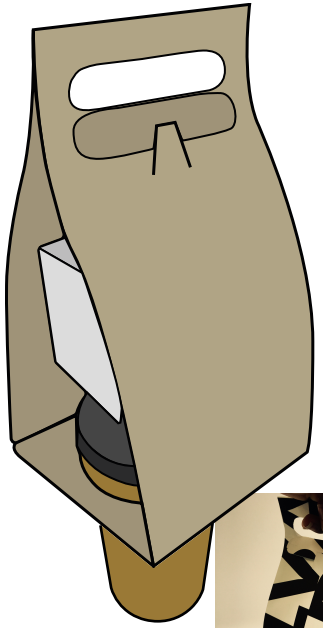




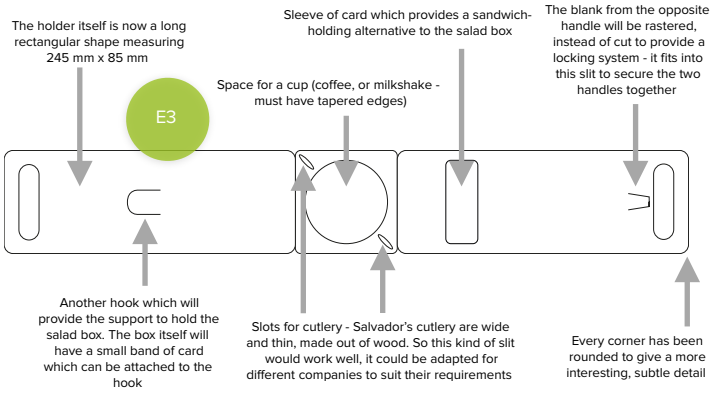
Potential surface graphics - all simple and minimal, with the possibility of advertising



Creating the final net on Adobe Illustrator - it allowed me to be incredibly precise with measurements and placement



NEWLY REFINED HOLDER NET



Response to feedback

"the material is a little thin and flimsy, I'd be worried if a customer had a full drink, as well as a baguette or salad that the material around the top of the handle would rip."

To solve this issue I could reinforce the handle area with single wall cardboard, like I did with the bottom panel where the drinks cup sits. This would make it more durable and less likely to rip in the customers hand.

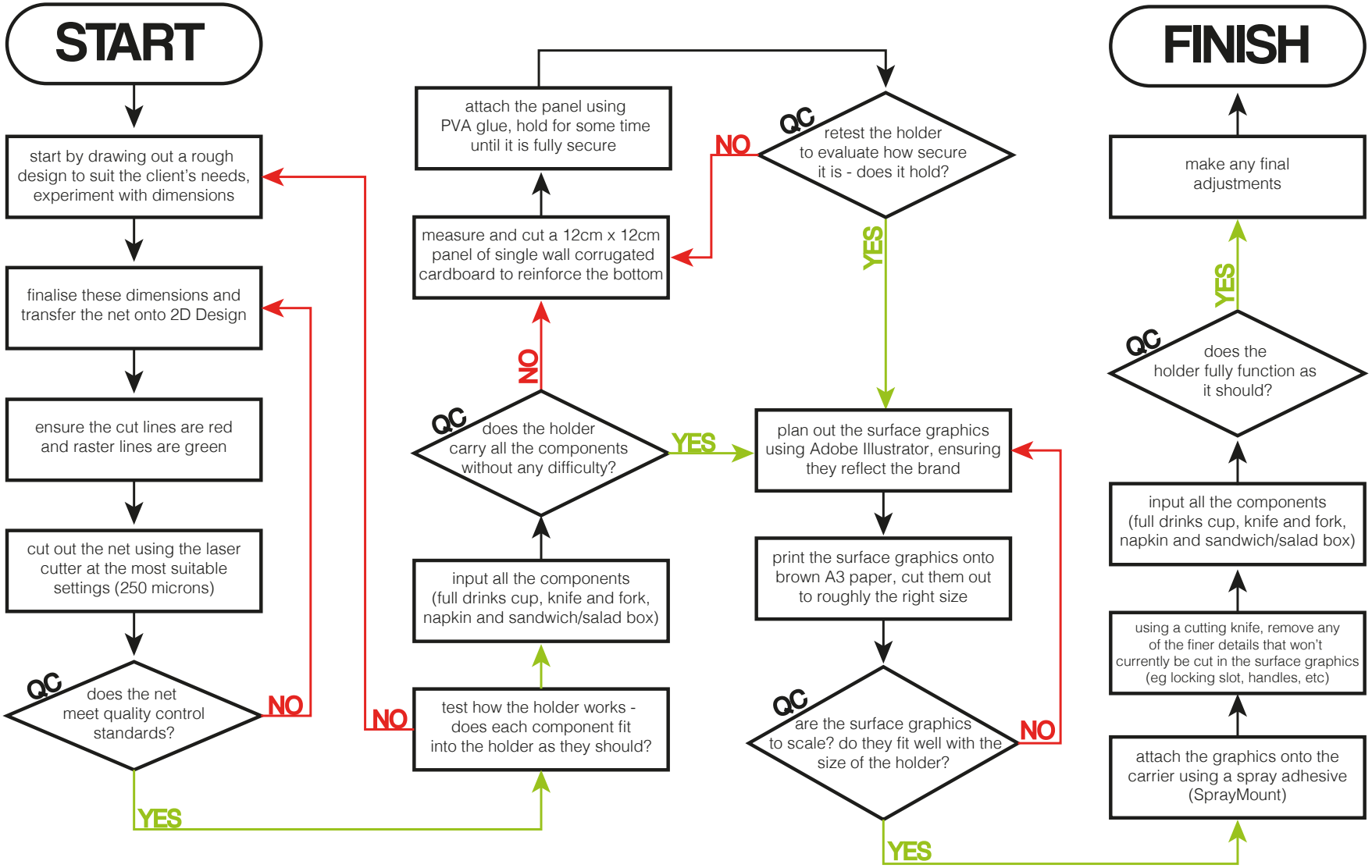
MAT2

A1

F3

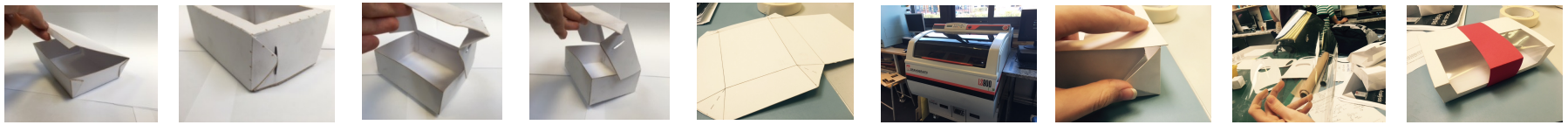
PROCESS OF MAKING

PLAN OF MANUFACTURE



PROCESS OF MAKING

MANUFACTURE PROCESS



The salad box was not the key aspect of my project, however I started by making a simple cuboid shaped box so that I could build my holder around it. I began with the most simplistic box, with a closing lid that didn't have anything in terms of keeping it held shut. Next I added two slots as well as triangle edges on the closing flap which could interlock to form a closing mechanism. This was unsuccessful due to the thick card I had used making it difficult to join the two together. At this point I had started to build the main carrier, I had realised the straight vertical edges didn't fit well inside tapered edges of the holder. So using 2D Design V2 and the laser cutter, I readjusted the angle of the edges so they were tapered also, in order to fit inside the carrier. I also added an acetate panel, just as the ones I had seen in my first hand research.

I began making the main body of the carrier out of one sheet of 450 micron white card. It had basic square shaped side panels, making it look boxy and unrefined. I also wanted to make the drink holder universally adaptable to any size cup, to do this I made lots of small slits around the edge of the circle, so they could bend and adjust to fit whatever sized cup was placed in. I found the main issues were that due to the shape of the salad box, a lot of space was wasted, so to counter this I tried playing around with curved edges. This gave the carrier a more modern and stylish look, however it also decreased the stability of the bottom panel, causing it to bend. I trialled a few of my surface graphics designs, and asked around for opinions. I then tried to glue the print surface graphics onto the holder, however there were issues with alignment and scaling.

Once I had decided there was little I could do about the angles of the original salad box not working in cohesion with the holder, I chose to adapt the carton to suit more of the 'deli specials' type of produce (Chilli Con Carne, Stir Fry, Pasta Bake, etc), this way the box could be more of a cube shape, as opposed to a wide flat shape, which would fit better inside the carrier. I chose to base my design on the iconic Chinese takeout box. It's made from one whole piece which means there are no joins, reducing the chance of leakages. In order to attach the box to the holder, I added a small piece of paper onto one of the sides of box to act as a slot for the hook on the interior wall of the carrier, this creates a hanger effect, holding the carton securely.

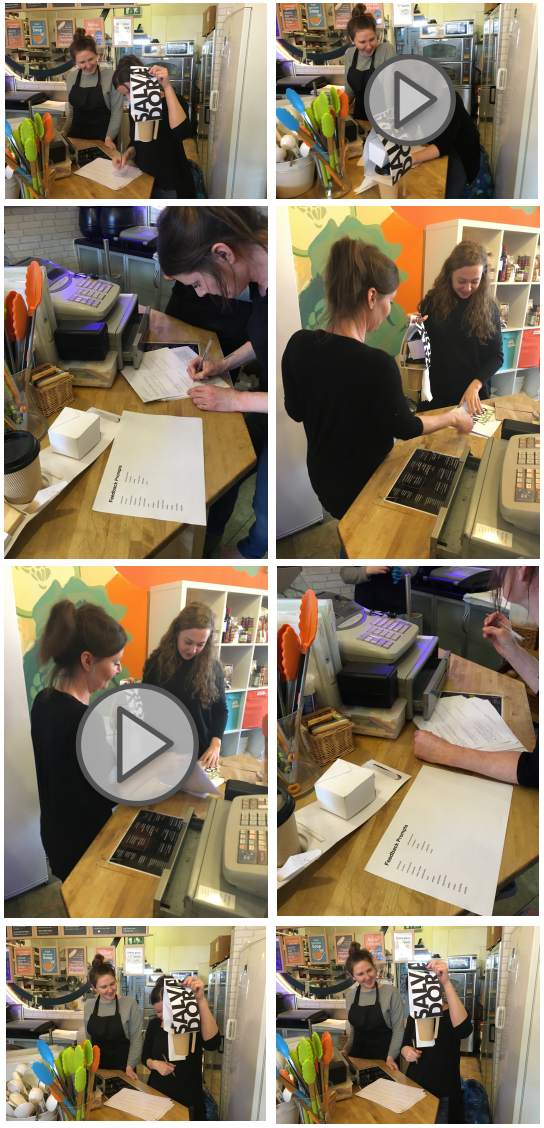
In an attempt to make the carrier more sleek and streamline, I modified the overall shape so that it was taller and thinner. This would works better in collaboration with the altered carton. Although some issues did arise. First, when using single wall corrugated cardboard, was how the square panel at the base of the carrier collapsed in on itself, forcing the card to bend in half. This majorly compromised the structure of the holder, meaning the components could not fit inside. However upon reflection, this was probably due to the choice of material as opposed to the design. The second issue was regarding the scaling; the laser cutter did not transfer the design to full scale, meaning that when cut out the entire holder was too small. The drink cup did not fit, and the handles were too small to fit even petite hands.

Once I had refined all the individual example components, I set about establishing the final design. I knew all the features it needed to include, each component had a designated area: the drink is suspended below, knife and forks each have slots adjacent to the drinks cup, two slots to hold a napkin, a hook to attach the takeout carton, and a sleeve to put sandwiches, wraps and pittas. The handles come together and the off cut of one pushes through the space and slides into the slot to form a lock. The bold, statement black and white "Salvador's" acts more as a decorative pattern, than advertising the shop, but it looks contemporary and smart. The bottom panel is reinforced with single wall corrugated card to make it structurally sound. The main body is made from 350 micron white card.

FINAL PRODUCT

TESTING AND EVALUATION

PRODUCT REFLECTION



Myself with Pamela and Liberty of Salvador's Deli, asking them for their thoughts on the product

POSITIVES

The product allows the user to carry their takeaway meal (including their drink) using just one hand, freeing up the other for a different use (eg opening doors).

It is made of single wall corrugated cardboard, 350 micron card, and printing paper which are all recyclable.

It is customisable to suit the client's needs and brand identity.

The main body of the carrier (made from 350 micron card), is this enough to be able to cut and raster easily and effectively, but still strong enough to carry the weight of the holder and its components.

The holder is reusable - however the user may need some kind of incentive, a reward scheme could be put in place, for example, if you reuse the holder you receive a minor discounted price on your food.

The amount of waste material is reduced due to the tessellating net.

NEGATIVES

My prototype is made from a mix of cardboards (350 micron card, and single wall corrugated card) and printing paper. Although all of these are still recyclable, they are all virgin materials, meaning they are not the most sustainable they could be. In industry, I hope to use end-of-life brown card which will be cheaper, and more environmentally friendly.

Each components that fits within the holder (knife and fork, napkin, etc) has its own designated space, meaning assembly should be easy. However, in reality some of the construction is a little fiddly and takes a bit of time.

I designed to suit the need of an 'average meal' (sandwich and/or special)/ This however means that if the customer's meal contains something out of the ordinary (eg soup), then it may not fit into the holder. I tried to make the slots and bands simple so they could be used for different things, however the external packaging may need to be adapted to incorporate hooks for the slots etc, so it works in conjunction with the carrier

POSSIBLE IMPROVEMENTS

Source end-of-life card from a responsible organisation, it should come from sustainable forests where there are schemes to replant any trees cut down on a 2:1 ratio. For every tree that is cut down, a further two are replanted.

The handle shape and size could be readjusted to make it more comfortable to hold and grip, especially when it is full, as making it heavier increases the potential discomfort.

Think of more components that could be held in the carrier (soup, baguette, wrap, etc), and ensure there is a suitable for them to be held also. This could be a band, strap or hole.

Add labels and/or warnings to aid aesthetics as well as the product description act. For example, having a "Caution: Hot Contents, Keep Upright" warning near the drinks holder for coffee.

TESTING AND EVALUATION

USER FEEDBACK

Name: Pamela Barrie.

Please describe and explain any **strengths** you think this prototype has:

Card carrier is a little thin + flimsy.

Attractive, convinient, compact.
only requires one hand to carry.

Please describe and explain any **weaknesses** you think this prototype has:

we buy bags at 30p each (approx)
As a small business we wouldn't buy enough "bulk" to justify the cost. High street businesses could buy in bulk therefore the price per unit would reduce.

What is your **overall opinion** of the product? Would you use it?

I like the concept and yes I would use it.

What would you change to **improve** the product?

Thicker card.
make it more substaintable.
~~Bigger~~ Bigger sizes possible?
waterproof?
Bigger for x2 people?

Name: Heather Charker

Please describe and explain any **strengths** you think this prototype has:

practical - product can be carried with one hand.
Eco-friendly; reusable & recyclable.

Please describe and explain any **weaknesses** you think this prototype has:

? durable enough, weight of drinks & food may cause it to break:
overall size may not be big enough.

What is your **overall opinion** of the product? Would you use it?

yes; really hard to juggle food & drinks up.
~~Attractive~~.
visible advertising for company.

What would you change to **improve** the product?

make it more sustainable.
Larger - space for more than one drinks carton.
Safety warning - hot drinks.

RESPONSE TO FEEDBACK

I received feedback from Pamela Barrie, who owns Salvador's Deli, Wallingford (my client), but also from Heather Charker, a chef at the Hilton Hotel, Swindon which often provide takeaway food for busy business people. This was incredibly valuable as Pamela was able to relate from a small independent business, while Heather could do so from a big name business.

I was able to gage a rough idea of how much Salvador's currently pay for their present basic brown paper bags (30p), and so she thought my current possible retail price of 70p per unit was very reasonable. Having said this, she also thought that since her business is so small, this cost may be too great that they would not be able to justify it.

C2

Heather also brought up some very interesting health and safety concerns - she suggested putting warning labels on the packaging near the hot drinks hollow, so that the company is covered with any health and safety legislation acts.

POSSIBLE MODIFICATIONS

Use a thicker material (700 micron card) to create the entire body of the container, or reinforce the area surrounding the handles using single wall corrugated cardboard, similar to the bottom panel for the drinks.

S3

Make the carrier larger, to fit a higher volume of produce inside (ie increase the takeout box size too, for a more substantial portion). Or add to the range of carriers to include one suitable for two people (ie two sets of everything - drinks, boxes, cutlery, napkins etc)

Possibly add a waterproof coating to the exterior of the carrier (and possibly inside the takeout box too, since it may contain fluids/sauces). This will protect the holder from any water damage caused by weather conditions - since it will primarily be sold in England which has a reputation for rain.

Add a "Warning: Hot Contents" safety label near the drinks hold, to abide by the health and safety legislation acts.

S1

TESTING AND EVALUATION

TESTING AGAINST SPECIFICATION

KEY POINTS

MAT 1
– should be biodegradable and recyclable in order to reduce the environmentally impact

MAT 2
– should be strong enough to withstand the weight of food whilst it is being transported (eg corrugated cardboard)

MAN 1
- the choice of material should lend itself to be easy the cut, shape, fold and print (lithography) onto

MOR 1
- the carrier should have minimal environmental impact - the 6 R's should be carefully considered throughout the product's life cycle

F 1
- the carrier should be quick and simple for the employee to construct from flat packed

P 2
– should withstand large quantities of weight without collapsing or breaking

P 3
– should be able to hold all components of a user's meal, meaning they only have to use one hand

MAT 1

– should be biodegradable and recyclable in order to reduce the environmentally impact

My prototype is made from a mix of cardboards (350 micron card, and single wall corrugated card) and printing paper. Although all of these are still recyclable, they are all virgin materials, meaning they are not the most sustainable they could be.
In order to improve, in industry, my product could/ should be made from end-of-life (brown) card instead as this will have less of an environmental impact. It should also have a positive economic impact, since end-of-life material will be cheaper than new.

MAT 2

– should be strong enough to withstand the weight of food whilst it is being transported (eg corrugated cardboard)

Again, my prototype is made from a combination of cardboards (350 micron card, and single wall corrugated card) as well as printing paper. During some of my testing, I noticed that the bottom square panel (originally regular 350 micron card, like the rest of the carrier) tended to give due to the weight of the holder when filled with its components. To prevent this, I created an identical 120mm x 120mm bottom panel, this time made from single wall corrugated card to attach to the holder to provide additional support.

MAN 1

- the choice of material should lend itself to be easy the cut, shape, fold and print (lithography) onto

My prototype is made up of multiple materials (350 micron card, single wall corrugated card, and printing paper), however each lends themselves to be well manipulated; the surface graphics are printed onto plain white printing A3 sheets, this is the perfect material to apply the graphical design to - it is not too expensive and yet it still gives a professional, high quality finish. The main body of the carrier (made from 350 micron card), is this enough to be able to cut and raster easily and effectively, but still strong enough to carry the weight of the holder and its components

MOR 1

- the carrier should have minimal environmental impact, the 6 R's should be carefully considered throughout the product's life cycle

My prototype is made from a mix of cardboards (350 micron card, and single wall corrugated card) and printing paper. Although all of these are still recyclable, they are all virgin materials, meaning they are not the most sustainable they could be. Having said this, many of the 6 R's can still apply. The holder is reusable - however the user may need some kind of incentive, a reward scheme could be put in place, for example, if you reuse the holder you receive a minor discounted price on your food. The materials are all recyclable, and waste materials are reduced thanks to the tessellating net

F 1

- the carrier should be quick and simple for the employee to construct from flat packed

Each components that fits within the holder (knife and fork, napkin, etc) has its own designated space, meaning assembly should be easy. However, in reality some of the construction is a little fiddly and takes a bit of time. Two possible solutions to this problem is preparing the holders in advance with the components already in place, or allowing the customer to do it themselves so they choose the components applicable to them, saving the staff at Salvador's time and energy

F 2

– should withstand large quantities of weight without breaking

Having conducted my testing, I don't think it's likely the holder will need to withstand more than 500g of weight at any one time. Having said this I tested it with more than the maximum (700g) just to see how it would withstand. Aside from a little bit of give from the handles, causing them to bend slightly it was completely fine

P 3

– should hold all components of a meal, meaning only one hand is needed

I carefully constructed the carrier to have designated spaces to hold the key components of an 'average meal' (knife/fork, napkin, drink, box and slot to hold a sandwich/pitta/ciabatta). This however means that if the customer's meal contains something out of the ordinary (eg soup), then it may not fit into the holder. I tried to make the slots and bands simple so they could be used for different things, however the external packaging may need to be adapted to incorporate hooks for the slots etc, so it works in conjunction with the carrier

HEADING	SPEC POINT	MET?
ERGONOMICS	E1	
	E2	
	E3	
MORAL ISSUES	MOR1	
	MOR2	
AESTHETICS	A1	
	A2	
	A3	
MATERIALS	MAT1	
	MAT2	
PRACTICALITY	P1	
	P2	
	P3	
FUNCTION	F1	
	F2	
	F3	
	F4	
MANUFACTURING	MAN1	
	MAN2	
	MAN3	
	MAN4	
COST	C1	
	C2	
SAFETY	S1	
	S2	
	S3	

MARKETING AND PRESENTATION

UNIQUE SELLING POINT

The unique aspect of my product is that it allows the user to carry a full takeout meal in just one hand. Whereas ordinarily with a regular paper bag you would require both hands to carry to drink as well, even if it was in a cup holder. It is also fully customisable to suit the needs of the individual client depending on the type of food they supply - sandwiches, salads, baguettes, drinks, fruit etc.

THE FOUR P'S OF MARKETING

PRODUCT The features and appearance of goods and services

The product allows the user to carry their takeaway meal (including their drink) using just one hand, freeing up the other for a different use (eg opening doors). It is made of single wall corrugated cardboard and is customisable to suit the client's brand identity.

PRICE How much the customers pay for a product

The holders will be sold in bulk to the retailer at a relatively low cost (at roughly 20p a sheet to produce, 3 holders can be made from one sheet, making each holder less than 7p to make). They must be sold at more than 7p per holder in order to make a profit. However they must not be so expensive the retailer can not justify purchasing the product, since ultimately they will be giving them away for free.

PLACE The point where products are made available to customers

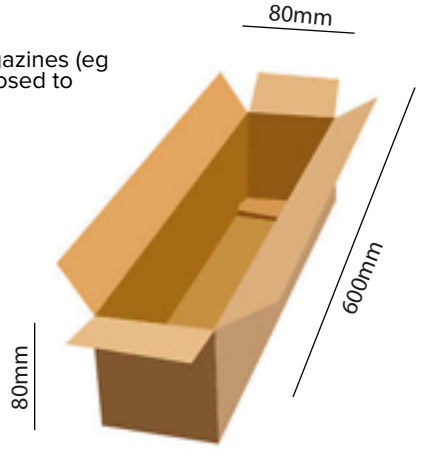
The holders will be available to purchase direct from our website (www.carrycolumn.com), via the online shopping page. The website allows the companies to view previous designs, as well as creating their own. Our company my also have stands at trade shows such as the BBC Good Food Show, and FoodEx, where new business can see the product, and potentially make an order.

PROMOTION How customers are informed about products

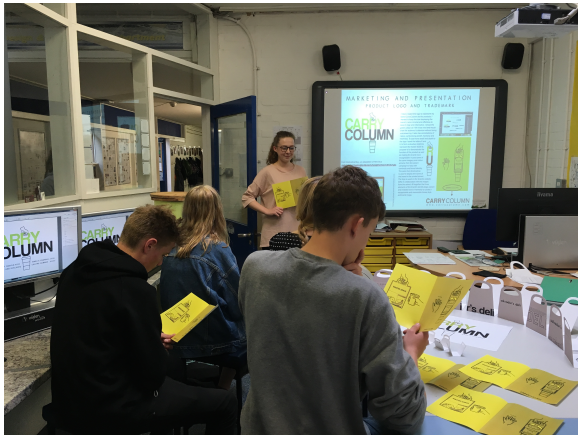
As mentioned in the next few pages, the primary source of promotion will be through advertisements in food industry related magazines (eg OOH), and food and drink trade shows. This will ensure we are directly targeting our target demographic of food retailers, as opposed to the general public

PRODUCT PACKAGING

Since the product is being sold to industrial companies, as opposed to the general public, there is no need for the product's packaging to be informative or used to promote the product. Instead, it can be purely functional; since the supplier has already purchased the product from the website. So, the product will be transported and supplied in a basic brown cardboard box. It will be the same shape as the holder (long, thin oblong (roughly 600mm x 80mm x 80mm) and since the holders will come flat, ready to be constructed, the box will hold approximately 50.



MARKETING PRESENTATION



In order to practise and refine a marketing pitch to potential clients, I first attempted one in front of my peers. I explained how the product works, who the target audience would be, as well as having prototypes and handouts for them to look at the product and marketing up close. I received valuable feed back about what worked (having hand outs, brightly coloured presentation slides, and prototypes) and what didn't (having an interactive slide show on separate computers which became redundant) which would help improve the presentation for 'real' clients.

MARKETING AND PRESENTATION

PRODUCT LOGO AND TRADEMARK

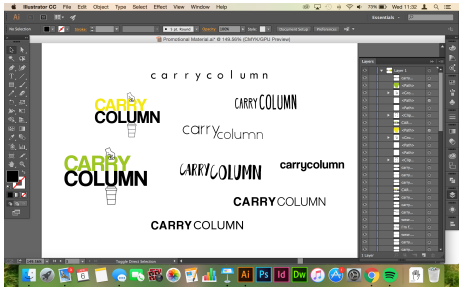
CARRY
COLUMN

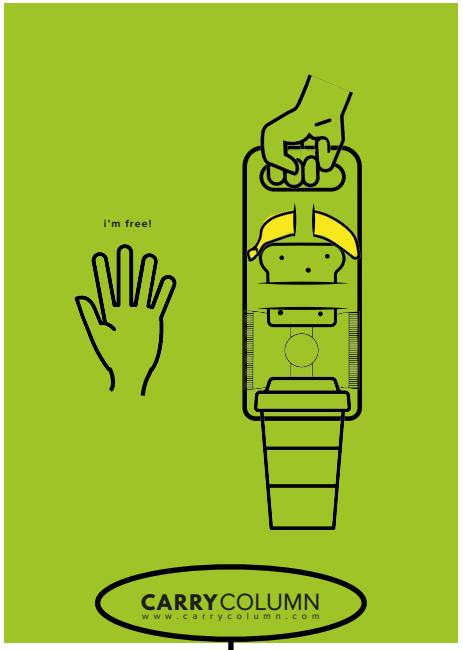
Font: Coolvetica Reg - an adaptation of Helvetica

AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSsTtUuVvWwXxYyZz

Company website (www.carrycolumn.com)

I have created this logo to represent my brand CarryColumn and its products. I wanted to keep the text displaying the brand's name minimal and effortless to keep it clear and informative. I chose the green colour as I felt it was vivd and would draw the audience's attention without being overpowering. It also has connotations of nature, symbolising growth, harmony and freshness. To add more detail and depth to the logo I used the letters R and U to form a structure (right) to represent the holder itself. Its purpose is to demonstrate the function of the product as well as making the brand more recognisable. It uses some of the same imagery and colour scheme from the advert campaign to help with continuity and brand identity. The same font (Coolvetica) is used to display the name of the brand in the printed advert. The logo is used on the brand's website (left), in collaboration with the images from the advert. All together the three elements of the brand's identity (logo, advert and website) work in harmony to create a recognisable and memorable house style and brand image.



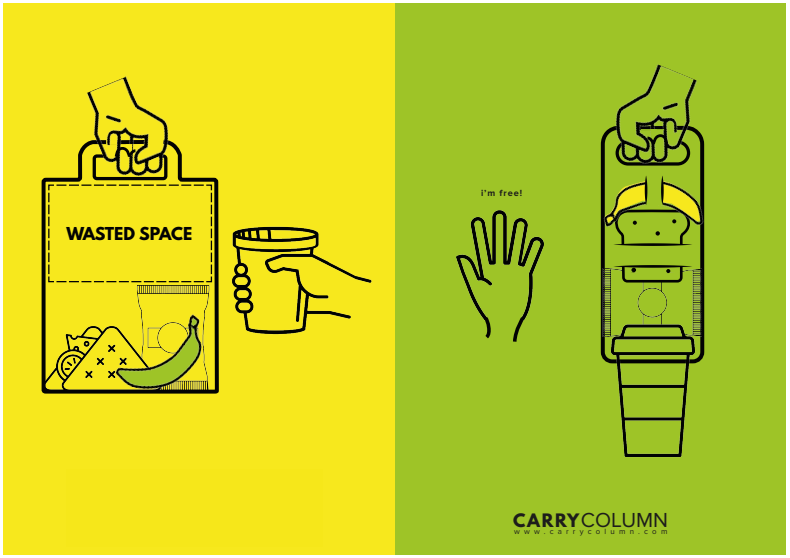


CARRY COLUMN
www.carrycolumn.com

MARKETING AND PRESENTATION

MEDIA FOR PROMOTION

Example mockup the simplistic, bright advertising campaign for CarryColumn, showing the problem and how the product provides a solution



Example mockup of the double page advert for OOH magazine

I have created a simple, vibrant outline illustration of the product functioning. I feel this is the most effective way to demonstrate the product's purpose easily and instantly. There is no complicated explanation or description - instead, the image speaks for itself. The first image shows the current situation, a paper bag which means wasted space and both hands full, compared to the second, using the CarryColumn, which solves both those issues. The minimalistic colour scheme and graphic ensures the function is obvious, the only informative text on the is the name of the product, and the website address (www.carrycolumn.com).

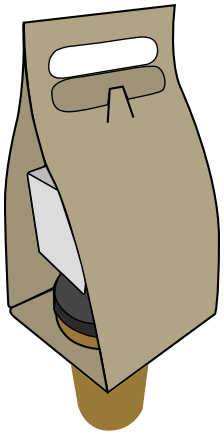
Since the product is aimed towards food suppliers and businesses, rather than the individuals who will eventually use the product, I think the most effective method of promotion is through a magazine which reaches the target demographic, such as 'Out Of Home' (OOH) magazine. OOH is the largest ABC audited publication in the UK that focuses on the quick service restaurant (QSR) and food to go industry. Readers are kept up to date with market innovations in ingredients, food, drinks, equipment, packaging and disposables. Launched in 2005 it was the first publication to cover this dynamic sector of the foodservice industry and one which contributes a significant share to the total eating and drinking out markets which in 2012 was estimated to be worth in excess of £68 billion per annum in the UK.

OOH is still leading the way, with an exciting format that delivers cutting edge content to an audience that spans a huge range of businesses from craft and scratch bakers to delicatessens; and casual fast dining to high street sandwich and coffee chains. Their audience includes individual operators to the largest well known groups with multiple sites including Pret-À-Manger, McDonalds, Starbucks, Greggs, Subway and Costa.

Per Insertion	Cost in £
False Front Cover	£6,500
Double page spread full colour	£3,950
Full page full colour	£2,500
Half page full colour	£1,650
Third page full colour	£1,250
Quarter page full colour	£950

If I were to place a promotion in OOH magazine, such as the one demonstrated (left), the rate for a double page colour spread would be £3,950.

REVIEW AND REFLECTION



DESIGNING AND MAKING PROCESS

The design and manufacture process was relatively straightforward, with some minor issues relating to the scaling and size of the carrier, as well as with the surface graphics. The design process allowed the carrier to naturally progress and evolve. Finding what worked well and what didn't, gave me chance to refine and develop the holder, as well as improving my creative skills. There were some problems which could have been avoided in industry, since they were a result of the limitations of school's CAD and CAM equipment. For example, the final dimensions of the main body of the holder exceeded the possible reach of the school laser cutter and printer, meaning I had to draw and cut the net out by hand. This meant the final appearance was a little irregular in places, resulting in the overall decline in the professionalism of the carrier. There was no way to avoid this, since it order to make the holder full scale it fills an A2 sheet, which the laser cutter does not work to this extent. This in turn, meant that the surface graphics would not be able to be printed on one continuous, full sheet since none of the school printers have the capacity to print to this scale. Instead I split the design into two halves, and printed them on separate A3 sheets, then glued them onto the carrier individually.

WHAT I HAVE LEARNT THROUGHOUT THE PROCESS

During this process I have gained an greater understanding about the need to be adaptable and open to alterations and compromises relating to the design of the product, which meant it didn't fully resemble what you had first planned to create. I had hoped to create a holder to support a salad box, however with the logistics and scale of the product, it was impractical to fit a thin wide container within. Instead, I decided to make the carrier thinner and longer, which allowed for a hot food, 'specials' box to be held instead. This made the carrier more streamline and stylish, one end-user commented they could really see it being used in a "trendy London coffee shop". Although I was not what I had originally intended; I am glad I decided to take the product in this direction since I am happy with the outcome.

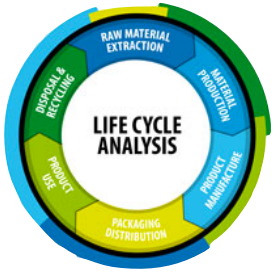
THE LIKELY SUCESS OF THE PRODUCT IN THE MARKET PLACE

Since the product will be sold to retailer, as opposed to the final end users, the CarryColumn's success will largely depend on the marketing and promotion through channels such as OOH magazine; the brand will need to work to build itself to be known as a reputable and responsible company, which always has its customers best interests at heart. It should strive to have excellent customer service, and put right any possible issues with may arise with the product. Once the company has established connections with both big-name (e.g. Pret-À-Manger, Costa and Starbucks) and independent retailers (such as Salvador's Deli) then, as long as they are satisfied with the product and nothing surpasses it, they will always sell the product. I think the product's flexibility and potential to be personalised to suit the needs of each individual retailer is its unique selling point. So long as the retailers purchase the CarryColumn, people will continue to use the product, since they are getting it for free, and the CarryColumn name will continue to be known and recognised, which will only add to its success.

REVIEW AND REFLECTION

WIDER IMPACT

LIFE CYCLE ANALYSIS



- In the production of my various types of cardboard, the Forest Stewardship Council (FSC), Leadership in Energy and Environmental Design (LEED), and the Sustainable Forestry Initiative (SFI), all insure that the raw material extraction process is sustainable. Their programmes guarantee a finite amount of trees are cut down, and those that are are replanted.
- Since I will be sourcing my card from forests in England, the impact of travel miles will be significantly decreased. Although the packages will still need to be transported by vans, this will not create as big of an impact as it would if they were carried across the world in planes.
- The manufacturing process itself will use electricity and energy due to the amount of printing, as well as the use of the laser cutter. This will impact the carbon footprint of the product, however there is little we are able to change to reduce this impact.
- The holder does not require any energy during its - it is not electrical, so does not need to be powered in any way.
- The carrier can be reused (some companies may want to offer a promotion in order to engage customers with this concept) and recycled once it is no longer reusable. Since it is end-of-life card anyway, it may be possible for the holder to be biodegradable.

MORAL, ECONOMIC AND SUSTAINABILITY ISSUES

MORAL

Social issues surround the preservation of human rights and a persons quality of life (primarily employees). Everyone has basic freedom rights - the right to safe working environments, food and water, health care and somewhere to live. The Universal Declaration of Human Rights (UDHR), adopted by the United Nations General Assembly, is divided in 30 articles and covers a whole range of principals which every person has a right to, simply because they are human, regardless of their nationality, religion, language or any other status. These issues will have minimal impact on my product - aside from the fair treatment and payment of my employees, as well as making their working environment a safe place to be - since the market my product falls within does not particularly promote or impede on any human rights. Social implications can also include packaging and descriptions of products, as they should deliver exactly what is advertised, fulfilling the users expectations. My marketing and promotional material for the CarryColumn must adhere to the The Trade Descriptions Act of 1968. It was put in place to prevent manufacturers, retailers or service industry providers from misleading consumers as to what they are spending their money on.

ECONOMIC

The primary cost implications will be relating to the purchase cost of the material, and promotional advertisement. As explained in previous slides, my prototype is made from a mix of cardboards (350 micron card, and single wall corrugated card) and printing paper. Although all of these are still recyclable, they are all virgin materials, meaning they are not the most sustainable they could be. In order to improve this, in industry, my product could/should be made from end-of-life (brown) card instead as this will have less of an environmental impact. It should also have a positive economic impact, since end-of-life material will be cheaper than new. Looking online, (www.kitepackaging.com) you can buy plain corrugated sheets of cardboard, manufactured from single wall cardboard, B flute board, available in brown only. For 1 pack of 40 A2 sheets, it is £9.10 - making it £0.23 per sheet, and being able to fit 3 holders per sheet, it works out to be rough £0.07 per carrier. This price also decreases with the number of packs you buy, if you purchase 36+ packs, the price per sheet lowers to £0.19, making each sheet £0.06. The second highest cost will be to paid for promotional materials (advertisements in magazines, posters, display stands, etc). As outlined in my marketing presentation, a coloured double page ad spread in Out Of Home (OOH) magazine, costs (£3950).

SUSTAINABLE

The environmental responsibility of a product's user ensures that our actions and lifestyle have the smallest possible impact on the environment. A product's environmental impact can be evaluated by looking at each step of its life cycle analysis; from the extraction of the raw materials, to creating, transporting and using the product, and well as its disposal. The more positive the life cycle analysis is, the smaller the environmental damage. This, in combination with the 6 R's (Reduce, Reuse, Recycle, Refuse, Rethink, Repair) should be carefully considered in order to make the most environmentally friendly product as possible. We can use this data to help understand and reduce the amount of energy used, and in turn pollution created. My prototype is made from a mix of cardboards (350 micron card, and single wall corrugated card) and printing paper. Although all of these are still recyclable, they are all virgin materials, meaning they are not the most sustainable they could be. Having said this, many of the 6 R's can still apply. The holder is reusable - however the user may need some kind of incentive, a reward scheme could be put in place, for example, if you reuse the holder you receive a minor discounted price on your food. The materials are all recyclable, and waste materials are reduced thanks to the tessellating net. In an age where global warming and climate change is in the forefront of people's minds, it is important the product is as 'green' as possible, since this will play a large part as a deciding factor for many companies who are eco-conscious.

REVIEW AND REFLECTION

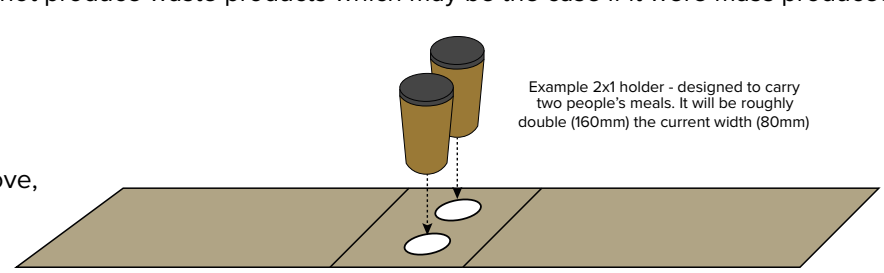
FUTURE DEVELOPMENTS

INDUSTRIAL AND COMMERICAL PRACTISE IMPROVEMENTS

In order to make my product as successful as it possibly could be industry, I would have to make some minor modifications. The product needs to be as economically profitable as possible - requiring the most efficient use of time and material attainable. I may need to readjust the scaling of the holder, it fit one more net per sheet, increasing production by a quarter. Time can be saved during production by using the materials efficiently and effectively, they are all readily available so should be ordered just in time, for each production stage so that excess material is not using up valuable storage space. Industry standard printers are likely to be more productive per minute, as well as producing a higher quality finish. This, along with a die cutter to press out the nets, will add to the overall finish of the carrier. As it currently is, the net would be suitable die cutting since it is made up of cut and raster lines. However there would be a need for a mechanism to glue, fold and attach the different components of the holder together. This would need a specialist programmed machine. I would also need to consider the manufacture location of the product since this will influence a number of details. These include transport costs, labour payment, the influence of any moral, social, cultural or ethical issues. I plan to manufacture the CarryColumn in England, and pay employees the living wage as an absolute minimum. Although this will be more expensive than say, China or India, it will also guarantee a safe working environment and fair treatment. It will also decrease the amount of travel miles needed to transport the goods. My product is going to be batch produced in order to suit the demand and fulfil orders, yet will not produce waste products which may be the case if it were mass produced.

DESIGN IMPROVEMENTS

If I were to chose one aspect of my product to improve, based upon the feedback gained from my clients - Pamela and Heather, it would be to make a wider range of holders which can hold one (1x1), two (2x1) and four (2x2) drinks cups. Both Heather and Pam said often people buy for more than one person at a time, and so having a holder which allows for multiple cups will allow a single holder to accommodate more components. Although this will have a slight economic impact due to the increase in materials needed, however long term, it will reduce the wasted materials since only one holder will require between a group, as opposed to many singular ones. The overall dimensions will need to be increased to allow room for more components and food. The reinforcement of the bottom panel will be crucial, particularly for the 2x2 carrier.



Example 2x1 holder - designed to carry two people's meals. It will be roughly double (160mm) the current width (80mm)