

DESIGN OF FOOD KIOSK FOR STREET VENDING
: URBAN INDIAN SCENARIO

INDUSTRIAL DESIGN PROJECT - II

MPR - 429

BY

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INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY

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IDP 602 : Project II

Design of Food Kiosk for street vending : urban Indian scenario

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Guide : prof. Purba Joshi

Approval

Industrial Design Project II

“Design of Food Kiosk for street vending :
Urban Indian scenario”

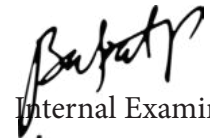
By: Patric john

M. Des Industrial Design 2016-2014

Is approved as a partial fulfillment of requirements of post graduate
Degree in Industrial Design at IDC, IIT-Bombay.



External Examiner



Internal Examiner



Project Guide

Chairperson

Declaration

I declare that this written submission represents my idea in my own words and where other ideas or words have been included, I have adequately selected and referred the original source.

I also declare that I have adhered to all principles of academic honesty and integrity and have not misinterpreted or fabricated or falsified any ideas / data / facts / sources in my submission.

I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources that have not been properly cited, or from whom proper permission has not been sought.

A handwritten signature in black ink, appearing to read 'Patric John', written over a horizontal line.

Signature:

Name: PATRIC JOHN

Roll No: 146130005

Acknowledgements

I'd like to thank

All the street food vendors who have co-operated with me for this project.
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Thanks to Ulemba [(just because he said to add his name while I was writing acknowledgment) well not really :)]

For helping me out in the beginning, I am thanking My batch mates and juniors at IDC who have been the greatest resource at the best and worst of times.

If I have missed anybody I'll add in the next project. okay :)

Abstract

India, the seventh-largest country by area, the second most populous country with more than 1.2 billion people with diverse beliefs, religious practices, life style & culture. Urban India is a place where you can see and experience these diversity and variety.

The project aims at designing a food kiosk which will cater to these urban areas. Today Street foods have inseparably become part of urban culture . Due to the huge population and diversity in urban population, even the streets foods got evolved and multiplied over times. Today a large variety of traditional street foods and modern street food items are available .

In this project I tried to look at these street foods and various inter-connecting elements and stakeholders in the system and come up with a solution- A kiosk in which it could cater to a section of street foods and vendors, which would in-turn support and enhance their potential of business. The project also looks at a plan/strategy which would complement each stakeholders in this system, which will enable the system to go forward in a better way.

Contents

Approval.....	i
Declaration.....	ii
Acknowledgment.....	iii
Abstract.....	iv

Chapter 1 : Discover.....	1
Primary research.....	4
Secondary research (data collection).....	20
Available products in the market.....	24
Classification of data.....	28
Vendor.....	30
Food.....	32
Activities of vendor.....	36
Factors influencing business.....	38
Customer.....	40

Chapter 2 : Define	46
Design brief.....	48
Potential users of product.....	52

Chapter 3 : Develop.....	55
Defining spaces.....	59
Ideas and formal exploration.....	76-149
Concept evaluation.....	151
Participatory design & rig making.....	155
Product detailing.....	161-172

Chapter 4 : Deliver	186
References.....	188
Bibliography.....	189

Project proposition and selection

Initially 3 topics were selected for Project-II

- Cafe Kiosk design
- Bicycle design for school children
- Multi-storage design for two wheelers.

Each topic had different aspects to learn from.

Out of these three,

Designing a cafe kiosk was finalized to take forward.

“Food kiosk design”

Why this project?

A kiosk or food cart is a product which is operated by a vendor, catering to various customers, in private or the public space. So there are various stakeholders and links in the product life-cycle.

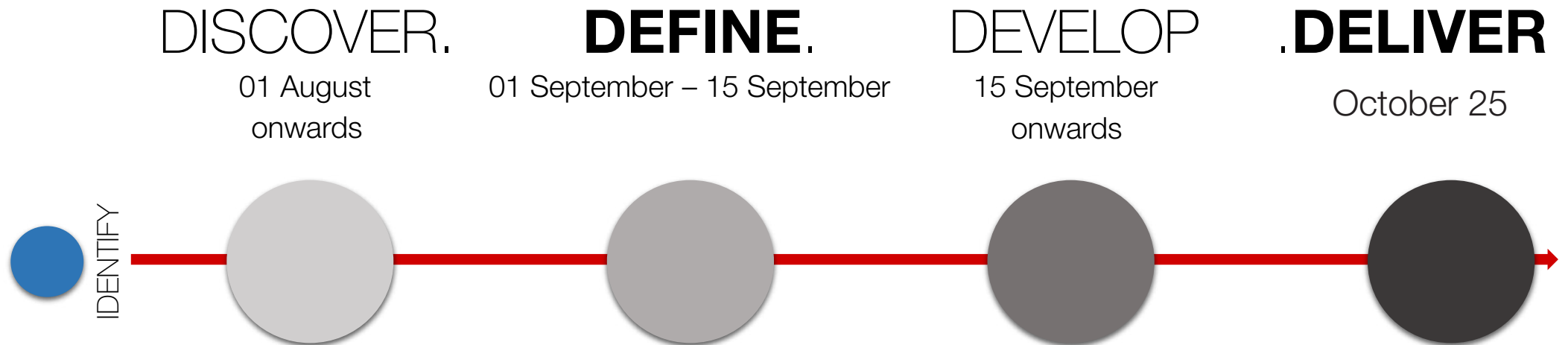
The main reasons to choose this topic are,

To know and understand about system level project. How a system works. How to find the stakeholders related to the product in the system. What all factors affect a product in system. How to find and analyze problems and solve them.

My understanding about the area/topic

I have been a lover of street food since my childhood. I have seen a lot of fast food vendors and had different types of food. I have had street food from almost all major cities in India like Delhi, Bombay, Calcutta, Hyderabad, Secunderabad, Kolkata, Chennai, Bangalore & Kochi. Almost 5 years I was a frequent customer of street food.

Project Development structure



Chapter 1

Discover

Why?

In order to design a product which can thrive in the market well, we need to find the product niche in various aspects. Only after a study about the current scenario will we be able to come up with a better design solution. So it's important to discover.

What?

I need to understand how the product is used in the current scenario, if there are not many products in the market, then I need to see how else they are managing to do it. Study about available products in the market is also important. Other aspects which we need to understand are History of street foods, street foods in other countries, street foods in India, street foods in urban India, Types of street food kiosks, alternatives for kiosks. From the manufacturer point, how it's made, how it's delivered, how it is used by a vendor, how it's helpful to customer, how it fits in the system etc. Basically I need to understand various stakeholders in relation with the product.

How?

More about a product can be understood in many ways, one way is to study the product directly, or understand it by comparison with other products in market, or understand/ "look" at the product through the eyes of various users and stakeholders. The data's have to be collected by both primary data collection and secondary data collection method. After collecting the data, it has to be analyzed.

Under discover phase, it is further arranged in 3 stages. They are:

1. Identification/Collection

Product study, primary and secondary user study, market study

2. Classification & Analysis of data collected

3. Inferences

History of eating from Outside

When did people started eating from outside?

When people started to travel long distances they had to eat from outside. It was impossible to carry large amount of food items through the journey.

The history points to the times of Greek and Roman civilizations where people selling food in hand-drawn carts, carts pulled by animals and permanent roadside wooden carts. The history of food carts and street foods circles around major cities. The driving reasons were time and traveling.

Street foods : Outside India

Whether it be the busiest and richest cities of America, Japan, China, Europe or any other country or poorest cities among them, one can see street foods. In many forms it appears. All cities and towns have special spots in which street food vending happens. Each city and its people welcomes street food in different levels. There is a lot of interesting facts and stories about each street food, cultures and people. It would take months and years to know and understand about the complete scenario of street foods around the world. So from the knowledge I gained from reading articles, watching videos, and from people, I have mentioned below the important points which are more relevant for my project.

- Street food vending is a socially accepted and appreciated Profession in developed countries.
- There are food cart and food-truck/vehicle manufacturers who designs and makes it.
- There is a good amount of support to street food industry from the public, customers, manufacturers and Law.
- There are good amount of resources for a vendor to build a cart for himself & there are standardized carts and accessories.

Well , most of these are points are more relevant in developed countries, the conditions of street foods in poor countries and developing countries are slightly different.

Street food festivals : Around the world

Apart from the support and providing of spaces in street for street food vendors, each country conducts street food festivals region wise and country wise every year. These festivals are good attractions of foreigners around the world, an opportunity for people to know and support street foods in their country and ultimately it is a great help to street food vendors and street food industry. India recently joined this trend back a few years. But still lack of good carts, accessories and good support from the country is difficult to thrive forward.

Street foods in India : Urban Scenario

How Indians perceive street food?

Different classes of people in India perceive slightly differently. A low class(bottom of the pyramid) person would not find any problems with the street food, because he is fine with the way they are making and he mostly look for the cheap price foods.

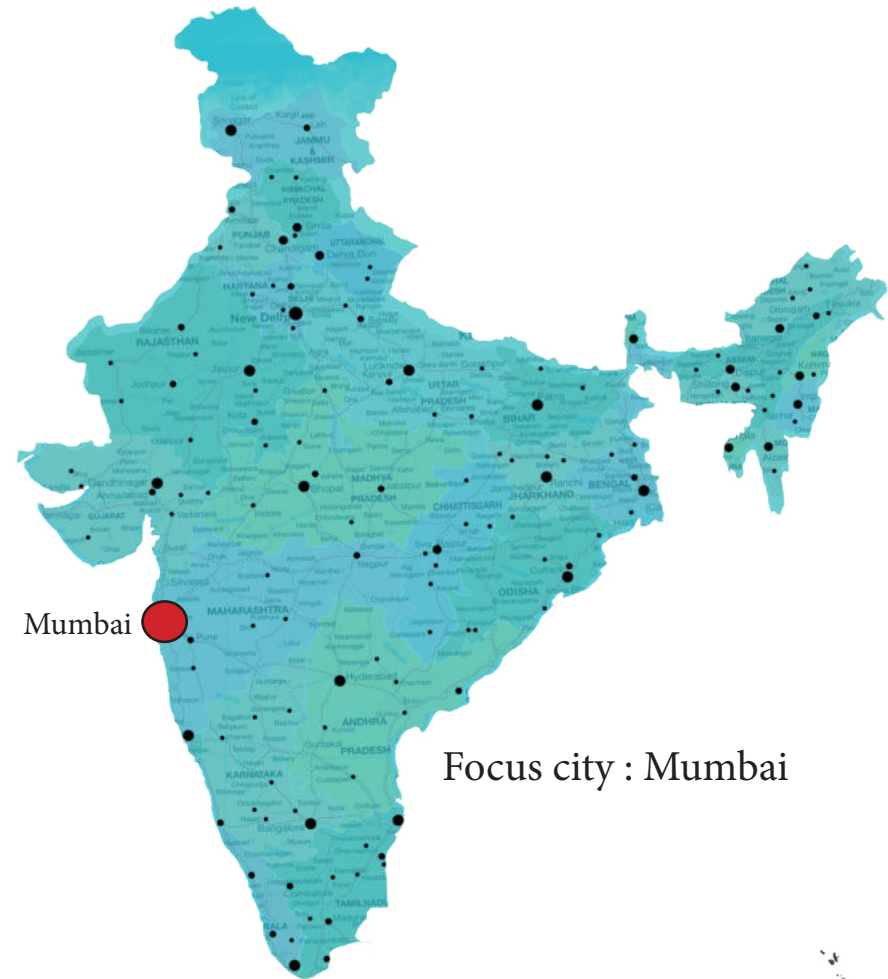
Upper class, middle class, lower class

Upper class people have lots of complaints about the vendor, the unhygienic way he prepares, the way the cart is and the surroundings. But there are people among upper class who really enjoy and support these street foods. Middle Class people are the main stakeholders and It was found that they are quite not satisfied with the hygiene of the street food and cart. But they continue to have food from streets.

Street food industry - and various stake holders
Vendor, customer & public,

Actual street foods

In India there are some foods which are mostly prepared only in streets and there are normal foods which sometimes seen/cooked/prepared in street foods . For example chaats and snacks are usually made for street vending.



The map which is shown above is for representational purpose and the actual National and state level borders might be slightly different

Primary research

Product study, primary and secondary user study, market study



photograph 1
A vendor cooking channa, At Khaugalli, churchgate.(up)



photograph 2
A young vendor selling corn, posing for the photo. At colaba(up)



photograph 3
A vendor cutting pineapple , near crawford market .(up)

Here we can see a male vendor aged around 30s selling chats, boiled channa masala. That's what he is serving there. One small paper roll costs about 10 Rupees. Depending on the size of the paper cone price will vary 5-10 Rupees. The cart is situated in Churchgate area, where there are other street food sellers too sell. This area will be crowded in from evening till night. Here we can see the food items for cooking is displayed. The chutney bowl is kept open, and there are no shades to protect from breezes and winds. In the photo he is preparing - boiling channa to make channa masala. He has used bright color plastic sheets to get noticed. The cart cost would go around 2000 rupees. The position of the stove and cooking vessel is far from the standing point, this is a very bad posture and will create serious health issues in long-term.

In this photograph we can see young male vendor posing for the photograph. This cannot be called as a cart. This is just a small stand to put the basket. This is also part of the street food. These stands might cost around 500 Rs or around it.

Similar cart like which we saw in the photograph 1. He is selling fruit salad made up of water melon and pineapple. In the photograph you can see polythene bag hanging on the cart, A red bucket filled with water. This is used for both drinking and washing fruits and utensils. There is a blue bucket kept for throwing waste. These kinds of cart will be moved in the night . since there is no wheels or rollers the person has to lift it and keep it somewhere safe. Even here also there is a use of bright Red color mat.

Usage of cart/surroundings



A sugarcane juice vending kiosk near Chhatrapati Shivaji Terminus.

Here due to lack of shades to protect from wind and dust, chances of dust accumulation on foods. But other wise it is good that people can see it from any direction and buy it.

Here we can see the vendor has used the surroundings for the storage of goods and used the objects nearby to his advantage. These kinds of stalls are more in other parts of Mumbai. They only sell sugarcane juice. Some vendors sell mineral water bottles, snacks etc along with it. This kind of carts are comparatively better ones in the current market. They use stainless steel for the structure.



A vendor selling puffed rice with masala , Borabazar precinct, near Mumbai central

The vendor have used the telephone Maintenance box as a storage space to keep his baskets. These are small stands and cannot be called as a kiosk/cart. But the visual hygiene level is low. There is no element to attract or to get noticed. Since there is few activities there is less serious issues related to ergonomics.



An empty cart where masala chats are sold , near Mumbai samachar Marg, Kala Ghoda.



A vendor selling snacks , near Masjid Bandar area.



A closed/wrapped up kiosk ,near Apollo Bandar
Usually the trend is these kind of kiosks will operate or start working after the evening. These kind of carts use a lot of space on the footpath. lack of planning and public consideration can be seen here.

A vendor selling snacks near Masjid bandar area. Due to lack of storage space and provisions in cart they have kept vessels on the road where dirt and flies will be attracted and will contaminate the vessel. They have space to keep the plates for customers to keep while eating.



Dabbelis Displayed after preparation ,
A food stall near Kanjurmarg.

Tea, (common indian chai) served in a glass in a tea stall ,
near Kanjurmarg.



An extension stall, part of a small restaurant , near Kanjurmarg.



A vendor selling chats , puffed rice and namkeen.
A view from churchgate.

An foreigner lady posing for a photo with a well displayed pan stall.



Another vendor selling chats, khaugalli churchgate.



Channas and fried mixtures. A view from khaugalli, churchgate.



Display of raw food items in a cart. Churchgate





A view from a street side, churchgate (with my friends from left to right(shashank Gautam, Shreelekha lakshmipathy , sony salma priyadarshini).



Two vendors posing for a photo. from churchgate. places like these where there are more vendors sell together are found in many parts of Mumbai



A vendor selling tender coconuts , khaugalli. churchgate.



Photo of a item from menu with price & picture, hung on the umbrella.



A vendor selling dabelis and bread toasts with masala.



A small cart which will act as snacks stall in the evening and night.



A closed vadapav stall. Near kanjurmarg Area



A samosa and kachori stall near powai area.

Carts/kiosks during day time



Ergonomics : Not proper placing of the cooking equipments and other accessories/equipments on the cart which leading to bad work postures and musculo-skeletal disorders. Also the movement of body parts is more.



pictures of vendor cooking channa.



A vendor vending soda , Masjid Bandar area.

Orderly arrangement of equipments and accessories is not a matter of life and death issue, but a properly arranged workspace can save lot of time and energy in the long run and can avoid chaos and misplacing.

A juice stall near Bangalipura area.



A vendor selling panipuri near powai,



A vendor selling Bread pakkoda , near IIT main gate, Powai



Extended street food stalls which only operates in the night.



A vendor selling vada pav and samosa near IIT area, powai.



A vendor sleeping on the pull cart with boxes and supplies, during day time, view from Apollo bandar, Colaba.



Samosa, mirchi and vada pav put for display ,in a cart near IIT main gate,Powai

khaugallis- street for street foods

Mumbai is famous for its street foods and stalls. Over the years these have become the integral part of the city. More people in different economic classes eat from these stalls on the roadsides.

Over the years public have recognized a few spots and streets for street food stalls and vendors. They are now known as khaugali. khao-means eat and gali means lane. Most big areas have their own khaugali. Youngsters are very fond of such places. Quick service and low price is one main factor pulls people to these areas. Several awareness programmes and events happen at these places to be more hygienic. Some vendor strictly follow these rules and practices. But most of the vendors dont follow them.

Secondary Data collection

As part of the secondary data collection I have read previous project reports , Newspapers- mostly e-papers, blogs of vendors,blogs of travelers, websites like youtube videos of street food preparations, pinterest pictures etc.



DRS

Visual Ethnography : Street Food Vendor

Done by, Midhun K.M (136130010),
student of IDC , 2013-2015 batch
Guide: prof. Nina Sabnani
IDC. IIT Bomaby

why i am taking DRS of somebody else?

DRS-Design research seminar is a special project in IDC, in which the student will usually go for primary or secondary research in selected topics. This «**Visual Ethnography: Street Food Vendor**» done by Midhun K.M in 2015 , now alumni of IDC, is such a work. This data will loose its relevance if it is not used immediately or as long as it sits in the library. Also This report complements my project and will be very helpful. After a conversation with the student he was also very happy that the data is going to be used and wont get “dusty” in the shelves of library.

His conclusions

1. The lack of infrastructure and the proper monitoring system has made this sector vulnerable to various problems which affects both the vendors as well as the customers ranging from hygiene to a sense of security to survive and run the business away from their home.
2. The resources such as time, water, ingredients, helping hands, infrastructure etc are crucial and is observed very clearly during the study.
3. There are vendors who do not face many of these problems, but the effort put and the income generated is very less which again questions the sustainability of these business and the struggles they have to face to meet the ends.
4. When the world is shrinking more towards the self, it is to be remembered that these food joints on the streets are few of the places which still keep the spirit of human beings to grow by supporting each other without any motive of profit.
5. This sector extends a wide opportunity to improve the infrastructure and to uplift the life of the vendors. But any intervention in this sector should be carried out only by a thorough understanding of these many fine elements upon which this wonderful culture is build upon.

What he did?

Visual ethnography of a street food vendor near IIT area, powai. Basically he studied a vendor and his activities as a vendor and a small study about his life & background.

How he did?

He clicked pictures , stayed with the vendor, observed and asked questions to understand about life and business of a street food vendor.

Pointers

Which I took from the conclusion.

- 1. Need Good infrastructure-cart + equipments and accessories**
- 2. Hygiene**
- 3. Security**
- 4. resources**
- 5. Wonderful Culture.**

Project on **Redesign of outdoor fast-food kiosk** **-As an extension of restaurant**

Shilpa-Tikale(97613002)
Guided by, Ravi Hazra

Shilpa-Tikale ex-IDCian, She designed a food kiosk as an extension of a restaurant. It has modular workspace. She tried to solve a few persisting problems such as Improper space planning, Bad/no drainage system, no protection from whether and bad aesthetics. But her was kiosk as an extension of restaurant. So many problems faced by a street kiosk vendors wont be there here in her project. So I cant take all the points from her project. The pointers which I have taken from her project is given below.

Pointers

1. Food items should be arranged properly - or else in case of Bad arrangement , it will lead to rejection.
2. Service - how fast and efficient it is, the more fast and efficient ,the more better.
3. Reduce number of preparing activities.

Available products in the market.

There are a few products available in Indian market. Some are available online also. Most of them are manufactured by local vendors according to the customer needs. Some vendors know what they want and build it according to that. The problem is many times vendors as customers don't know what is good for them and how it should be. Even many of the manufacturers also doesn't know how to make the carts or kiosk with ergonomic considerations and basic provisions for various activities. Some products are good for particular type of Vendors, but there are no products which are designed with a thought about various stakeholders in the system. Here I have shown a few products from the market and their strengths and lacunae.

Currently if an existing vendor wants to upgrade, means if he wants to buy a new cart he has only few options either approach a local fabrication unit or local manufacturer and get it done/buy it. Else the other way is to buy it from Online sites and there are currently only very few sellers Online and there are majorly two issues with those, one is cost and the other one is transportability. Most of the kiosks are pre-assembled and will be transported in trucks. So there are losses to both manufacturer and vendor. Wastage of space, money and time. Many manufacturers say that their kiosks are modular, but actual considerations are lacking in most of the products.

Momos Cart



We as jagdambey pre fab pvt ltd manufacturer & supplier of Momos Cart.. The offered carts are manufactured using advance tools and equipment in order to ensure optimum standards of quality.

Features:

- Termite resistant
- Weather proof
- Easy to clean
- Size is 5ft x 2.5ft
- Price :- Rs. 78,000/-

Approx. Price: **Rs 78,000 / Piece**

[Get Best Quote](#)

Portable Cart



We as jagdambey pre fab pvt ltd manufacturer & supplier of Portable Cart... Available with us at highly reasonable market prices, these carts are precisely designed for selling of Rajma-Rice. These carts are manufactured from high quality raw material, which is procured from trusted vendors.

Features:

- Long functional life
- Easy to clean
- Fine finishing
- Size :- 5x2'.5"
- Price :- Rs. 95,000/- Onwards

Approx. Price: **Rs 95,000 / Piece**

[Get Best Quote](#)

Portable Cart - Fast Food Cart Manufacturer from Delhi.. 2015. Portable Cart - Fast Food Cart Manufacturer from Delhi.. [ONLINE] Available at: <http://www.jagdambey.com/portable-cart.html>. [Accessed 18 December 2015].



http://img03.olx.in/images_olx.in/114087723_1_1000x700_kiosk-stall-food-counter-in-good-condition-for-all-purposes-chennai.jpg



Wholesale Product Commercial Fast Food Cart

Promotion Price: **US \$4760.00** / Unit

Wholesale Price: **US \$4800.00** / Unit

Min. Order: 1 Unit

Shipping: **US \$5344.09** to United States by **Express**
Ships out within 25 days.
Estimated Delivery Time: 6-20 days

Quantity:

Buy Now **Add to Cart**

★ Add to My Favorites

Secure Payment

- ✓ Payment held until buyer confirms satisfaction
- ✓ Full refund if you don't receive your order

See larger image

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ZOOM

eson.en.alibaba.com



Major Lacunae with Indian products

Lack of space consideration for basic provisions like water for drinking, storage for equipments and accessories, mobility, flexibility of workspaces or modularity, Aesthetics, Visual hygiene.

Products outside India

Design considerations in Indian context is one of the major aspect lacking in products which are manufactured outside India . Most of the carts are designed for other countries. The scenario in India is different from other countries, the cooking style, food types, resources availability vendor characters and their mentality. Even the rules and regulations which govern them are different. Another major setback of foreign products are high price and transportation hurdles. Most of them are costing around 1.5-2 lakhs. For some of them importing charges are more, it even going 4/5 times of actual price. These kiosks are not designed to be dismantled and sent. They are assembled and sent as whole in big trucks and trailers.

Pointers

- 1.The price of the cart should be within 1 lakh rupees.
- 2.The cart should be able to dismantled and sent in a box to the vendor(as customer).
- 3.Thoughtful design- considerations about Indian scenario and various stake holders.

Classification of data

After the primary and secondary data collection the data is grouped into sections and tables, charts etc.

it is classified into product family, product range, Manufacturer range (user range), product locations, Vendor-all details, customer-types and other details, cart, street food organizations etc.

Kiosk - Product family

Not all the street food items are sold in kiosk or carts. In India there are lot of variations in them.

1. Hand baskets which can be kept on raised platforms
2. Portable stands -small
3. Push/pull carts
4. Cycle-customized to sell tea/snacks.
5. Scooters/powered two wheelers.
6. Three wheelers- manual pushing
7. Three wheelers with self powered engines.
8. Four wheelers like - cars, jeep, omni, pickup trucks etc.
- 9.Trucks- Medium & Big

Kiosk - Product range

Even kiosks there are different types in the market in India.

1. Temporary kiosks
2. Permanent kiosks

The above given are basic categories, but in the streets one could see a lot of varieties in carts.

Product locations - kiosk

In India one can see a lot of varieties of kiosks and carts in a various locations around. Mostly they gather at places where people gather. They include Malls, Theatres, parks/other tourist spots, streets, institution offices, Highways etc. One can even find these vendors around religious places and buildings. Gatherings - festivals, Expo/exhibitions/Melas. Transit nodes - harbor/ports, Bus-stands, Airports etc. We could classify these areas according to the size and standard/class. For example bus-stands we have seen a lot of them, there are tiny bus-stands, there are medium sized and there are big bus stands where hundreds of buses comes and goes in. These places can be classified as class-A, class-B, class-C etc. One thing I have noticed is, in class-A, class-B locations where the crowd has higher spending power, not all the vendors are allowed to vend near these places. Aesthetics play a important role in this situations. Also visual Hygiene is very important since for class-A and class-B people its very important.

Pointers

1. Aesthetics - of the cart is very important.
2. Visual hygiene- the cart should look clean and visually hygienic. (It has to be really hygienic, but as far as people's concern visual hygiene is more important for them, because they cant test the food items)

Vendor



Who is a vendor? What does he do? How he become a vendor? There are lots of aspects to be understood. The description of a vendor to the public is, a person who sells food in the streets. If i would have to describe who is a vendor , i would describe “A street food vendor is a person who prepares or brings food and sell on the streets.” There are more meaning and spirit to street food culture than anybody would have thought of. Let us know more about the street food vendors , street vending , their carts and other various people and aspects in the system.

According to THE STREET VENDORS (PROTECTION OF LIVELIHOOD AND REGULATION OF STREET VENDING) ACT, 2014 the definition about vendors are given below.

“Mobile vendors” means street vendors who carry out vending activities in designated area by moving from one place to another place vending their goods and services;

“Stationary vendors” means street vendors who carry out vending activities on regular basis at a specific location;

Age structure

Currently, In the scenario the age group of street food vendors ranges in between 18-60 .even after the implication of the rule there are still children who sells street food.

Being a street food vendor, one has to do different kinds of job. He/she needs to bring the cart to the area of the selling, arrange the cart, need to prepare food, serve food, collect the money and wash the plates.

Each vendor target specific customer range. Some vendors target urban poor , while some target middle class ,there are only a few vendors who target upper class people. Those vendors who target upper class people should have good amount of capital and resource. Their investment is comparatively high with that of other vendors. There are vendors who target foreigners and tourists. Those vendors who wants to upgrade their business maintains good hygienic habits. But the lack of the infrastructure is still a problem.

Most of the vendors are open minded people as they see and talk to a whole range of people everyday. In the present scenario only a few people starts / joins street food carts or kiosks. Because of lack of proper recognition for street food vendors. In the society only a few people values the job of a street food vendor. Apart from the low cost or tasty food it is a service to the public.

After the survey & study along with my understanding of the street food industry I found out that there are certain section of people who wants to join the street food vending business but limiting them now due to lack of infrastructure. A proper setup to begin is what now one of the major issue which is lacking in the market. A product which is suited to the streets of urban India and urban street food vendors.

Problems

faced by the vendor & created by him

While having a day to day effort to run the business the vendor faces various problems from different stakeholders in the system. Corrupted police officers taking bribes , varying income/little income, maintenance of cart/kiosk. The amount of problems depends on the person to person. But there are certain problems common to all.

For example giving bribes to law enforcing officers to do street food vending. These usually happens to people who vends on the sites which are outside the permit limits. Each state has alloted certain areas for street food vendors to sell their food. Those vendors who do not follow these and sell outside , law enforcing officers either gives them proper punishment or penalty. Else vendor is forced to give bribe. In some cases some vendors bribe the officers beforehand to sell or occupy in certain areas. But it is not just officers, sometimes these vendors have to give bribe to shopkeepers or other authority of the place where they are vending. so i found out that giving bribe is a relative problem and it is part of the system where law is associated.

This should be solved by law and people. Vendors should not sell or vend food in places where it is restricted and strict law should be followed to see that no bribe or money taken from the street food vendors

Daily income

On the basis of daily income vendors can be classified roughly into 5-6 categories. Those who earn 500+, 1000+, 2000+, up to 5000 and 5000+ etc.

Customers

Based on the number of customers they cater to we can classify vendors who targets 50+, 100+, 250+ etc. Only well efficient and experienced vendors can target 200+ customers.

Amount of food prepared

A vendor prepares or brings a particular amount of food based on nearness to busy spots or crowd gathering areas, season, Weather, previous days consumption, size of cart or selling area/ storage space, depends upon festive days or holidays etc.

Food

Indian urban streets is one place where one can see both Indian style foods and foreign style foods. The streets foods can be categorized into different groups according to various aspects.

Types of food						
Rice items	Roti Paratha Puri Bread items	Sabjis Curry Fried items	All kinds of snacks & chats	Cold drinks/ juice items	Hot Beverages	Fruits/ vegetables

Food preparation

Depending on the type of food being, there are different ways to prepare the food. Boiling, steaming, frying, deep frying, heating, firing, smoking etc are used for cooking and peeling, mixing, cutting, squeezing, shaking, etc are practiced for food items that doesn't need special preparation.

Food preparation

Complete cooking

Heating / half cooking

Doesn't need to cook

Complete cooking

On-site complete cooking practice is rarely found during the survey. One reason is due to space and time of the vendor and the other one is law also doesn't encourage people doing on-site cooking. The reasons are most of the vendors doesn't have enough resources to cook in hygienic conditions and dispose the waste. Hence most vendors pre cook to some level and bring it to the site and reheat if required or sell it like that.

Heating/Half cooking

Most preferred method followed by most of the vendors. The main advantages are the vendor doesn't need to spend time and energy on the streets for cooking. Since it is heated or uses some method to make it fresh customers will more like to have it. Eg: Chicken, fish or vegetables like Gobi etc are boiled and brought to site. When required they will be deep fried /heated and given to the customer. so only the frying/heating time is taken since boiling is done from the vendors home or some other place.

Doesn't need any cooking

Mostly chaats and fruits comes in this category, They are just peeled, sliced, mixed, cut and made ready to eat. These are usually preferred by vendors who sell items in small baskets or stands. Eg: channas, water melon salad, Bhel chats etc.

Mode of fuels & equipments used for cooking

Currently in the scenario kerosene and gas stoves are the commonly used for different methods of cooking. Vendors who can't afford LPG cylinder price usually use kerosene stoves. And vendors who can't afford kerosene stove or doesn't require kerosene stoves use charcoal, wood pieces. Both kerosene stove and LPG stoves have their advantages and disadvantages.

LPG

Pros: less pollution and emission of hazardous gases and particles compared to kerosene. Can use high pressure and low pressure valves to adjust cooking. Clean energy compared with other modes. Government subsidy available. Faster cooking.

Cons: Takes more space and heavy compared with kerosene or charcoal. More money-more investment. Need good amount of physical strength to put it in the position. Availability is not a major issue but should be ready with another cylinder to replace with it when it is over.

However recently government introduced 5kg cylinder for small purposes. But the availability of 5kg cylinder is less in the market. Since it is not a popular choice.

Kerosene

Kerosene is another commonly used fuel. It is comparatively cheap and easy to get. The equipment for kerosene stove is also less price.

Charcoal

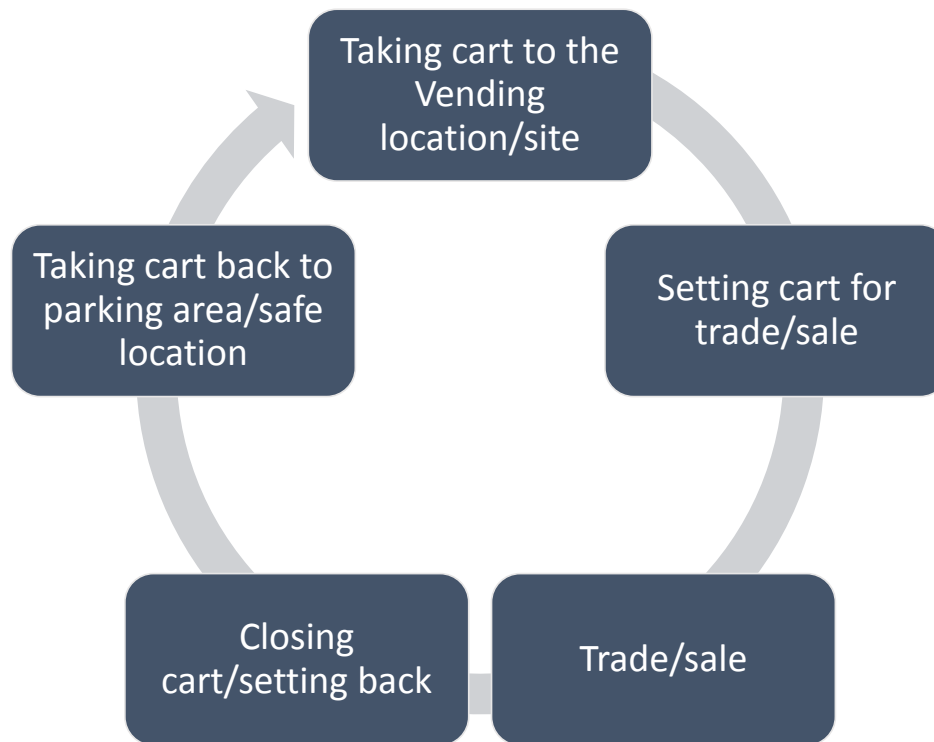
Charcoal is considered to be very inefficient fuel to produce and it is not clean comparatively. Although charcoal stoves are more efficient than firewood stoves but they are less efficient than modern fuel stoves such as kerosene and LPG stoves. Is usually used by people who want less heat for preparing food. Mostly corn makers, small chats, channa etc. Many times those who make dosa also use charcoal. The biggest advantage is it is cheap. Also there is no requirement of special stoves or burners. Some people rarely use small wooden pieces.

Schedule of the business

After the survey I have found out that different vendors have different operating time of kiosks. Some people work from morning till night while some only work in a particular time slot. Some people schedule their working hours according to season. Some people change the food items and working hours according to season. Some people come with a particular amount of food and leave when it is over. Most people which have food items which cannot be stored and used for tomorrow will stay till it is over. While some will give it to nearby vendors.

Below I have categorized vendors according to their time schedule

Vendor A	Vendor B	Vendor C	Vendor D	Vendor E	Vendor F	Vendor G
• Morning - Night	• Morning - Evening	• Morning - Noon	• Noon - Night	• Evening - Night	• Noon - Evening	• Night/ • Morning/ • noon/ • Evening only



Major activities in street food vending, by a vendor in a day (of a food cart with wheels)

List of (usual) activities by a vendor in a day

- Approaching the cart with goods and food items.
- Checking the cart and surroundings, whether if its alright.
- Unlocking the tires, if there are tires and if its locked.
- Pushing and/or pulling cart to the vending spot/location (lifting cart if its light weight. Sometimes may ask for help if the cart is too heavy or need to cross some obstacles.)
- Reaching the vending/selling site.
- Locking tires to avoid rolling, either with a lock or by putting some stone or block on sides of tires.
- Setting of the cart (includes cleaning, washing, arranging equipments etc.)
- Start preparations, and cooking >if there is any cooking.
- Preparing and serving food according to the need.
- Collecting money and returning change, if.
- Refilling Jug/bottle for drinking.
- Collecting plates and putting in dustbin.
- Emptying the dustbin into nearest public waste dumping area during the free time(when there are no customers), if the dustbin is full or might become full.
- Collecting/getting goods required if necessary.
- At night, taking cart to nearest public wash area.
- Cleaning cart and vessels and equipments, if required.
- Arranging the cart for closing down.
- Closing and locking cart, ensuring and checking whether its all safe.
- Pushing and/or pulling cart back to the parking area/spot/site/location.
- Locking wheels and movement of cart.
- Checking everything and ensuring.
- Going home with leftovers and equipments/accessories.

Left over food

Usually vendors make or bring food by considering the sales in previous days and probability of sales on coming days. So mostly the food will get over by the time of closing. Some food items which won't be decayed/damaged in a day will be taken back to his home. To reduce the wastage of food, some vendors will sell the food at low price or give extra during the last hour of sale. Some food items which are still not sold, nor can be taken back will be thrown away.

Toilet/washroom

Any person requires to go to toilet/washroom at least twice or thrice in a day. Vendors usually go to the nearest public toilets or shop which are known to them. Some vendors even go in the public.

Furnitures

Custom made stools, chairs, old wooden boxes etc are usually used for seating. Stone blocks or brick are sometimes stacked together to form a raised platform for seating. Provision of chair/stool would be a great addition to increase productivity of vendors. Since many don't sit at good postures while working and develop serious musculoskeletal disorders.

Daily expenditure

Daily expenditure of vendor depends upon the type of food, amount, equipments and accessories. It might range from 250 - 1000+ a day.

Electric equipments/accessories used

Some vendors use battery powered emergency lamps at evening and night. Those vendors which have their carts near to some shops take power from the shop and use CFL lamps or tubelights. Those who don't have access to electricity use Gas or kerosene lamps and lanterns, like petromax etc.

Various Factors and their influence on the business (per day income of Vendor)

After the study i have found out that a number of factors affects the business or income of the vendor.

Price

Price of the food items is one factor. Pricing of the food items also depends on the kind of kiosk they have.

Taste of the food effects the business mostly. Kiosks which have proper shades can protect food from rain and sun and effecting freshness of food.

Type of food

People prefer to eat different types of food at different times of the day and at different times of the year. Due to this

Quality of service of vendor & of cart

Hygiene - visual Hygiene

Of cart/ kiosk, of vendor, of food, of surroundings

Special Days

On holidays and special days people amount will be varied.

Some festivals like EID and other festivals , there will be special streets for these.

Amount of customers

The number of customers is a clear factor which effects the business. There are many reasons which effects the customers to reach.

Location of the cart

Each location provides the vendor with different range of customers. It is very crucial for the good business. Good spots like busy bus-stand areas, transit nodes etc will provide with high income where as in places which are far from busy areas there will be less frequency of customers and thus less income.

Aesthetics of cart/Kiosk

People who don't eat daily, likes to eat from good looking kiosks whenever they have.

Season

Some vendors change their menu and food items according to the season. The same cart will be used for different food item in another season

Climate & weather

It is one important factor which effects the business of street food vendors. In the current scenario most of the carts doesn't have proper shades to protect from scorching sun, dusty winds or from rains. Due to this they could not even sell the food on days when there is raining . Some vendors make their own shades with tarpaulin sheets and other materials which are locally available and tie to the nearby structures. Some takes an effort to put bamboo or wooden poles. Only a few carts have proper arrangement for protection from bad weather. Due to lack of proper shading, rain water will enter the kiosk and spoil the food items or dust can settle on food and create bad taste or bad appeal among customer which will result in loss of either customer or profit or both.

It is found that the street food vendors who have shades and protection from rough weather is getting more business or customers than those who don't have. It is also found out that many people like to have a hot tea and snacks during a drizzling rain or cold mornings and have a cold drinks or juices when there is hot sun above.

Time/hour of the day

In particular place the most customers come at particular time. so selling food at right times is one important factor.

Customer

Customers are secondary users of the product - Kiosk/food cart.

In India the range of customers of street food origins from the smallest of slums to Big rich apartments. But due to lack of hygiene and other issues people from upper class are very few and often very careful about street foods. Upper class or affluent class people doesn't encourage themselves from eating from street foods. Even middle class people doesn't consider street food vending as a good profession. Earlier we discussed since there are only a few manufacturers or decent carts to sell these food items, people often mistake street foods as low quality.

Lakhs of daily commuters eat from street foods. Office employees, workers, school children, college students, tourists, all people eat street foods. Most people prefer to eat snacks or light foods. One reason is that it is mostly available and easy for vendor to make. Price is one of the major aspect people eat from street food. Ambience and taste is other major factor anyone would like to have them.

Hygiene is one of the major problem faced by most of the customers. When they were asked, they preferred the street food more, if the cart, vendor and surrounding is more clean and hygienic.

Major likes of customers about street food are taste, variety, speedy preparation, way of preparation, location, ambience etc.

Street food organizations

Government policy and Law & Regulations

What is the 'fuzz' in the newspapers about street food vendors?

Why Court is issuing such Rules and regulation for street food vendors? Is court against the Vendors and their way of living? Does court dislikes street food?

NO the court or law is not against the street food vendors, But when vendors unhygienic way of cooking and vending in streets and places where it is forbidden it creates public nuisance, these are one of the reason the court doesn't allow or gives rulings.

Is court rule the finale ? Is there any possibility to change the rule? How ?

Court rule is final, but It can be changed later. Currently the court is against the on-site cooking in street food vending, but my opinion is if we can come up with a better solution for hygienic cooking and practices then the court will allow or give permission. In other countries where the vendor is trained and educated, have good cart and accessories the street food vending is very appreciated and enjoyed.

NASVI

National Association of Street Vendors of India

NASVI is a national federation of street vendors in India, started in 1998 as a network. The organization's main Objective is to support and Protect the livelihood rights of thousands of street vendors in India

Currently there are awareness programs and efforts for training the vendors happening around India by Nasvi and other street food vendors organizations. But awareness alone can't change the scenario, they need infrastructure and products and accessories to practice what they have been trained for.

Is NASVI the only organization?

Or are there more organizations?

No, apart from the NASVI each state has their own organizations.

Major strengths

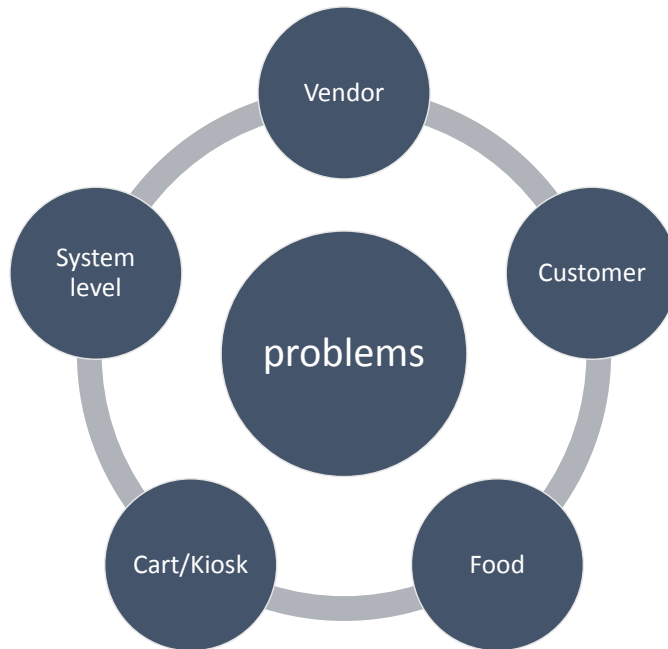
- Different and unique experiences of locations and its ambiances.
- Diverse and unique styles of preparation.
- Variety of taste
- Reaches & Serves to a large section of population
- Supports livelihood of millions of people
- Low & affordable to majority of Indian Population
- Fast and Instantaneous service
- Requires simple skill and less investment (relatively low capital)

Major Weakness

- Less/no Design carts/products/accessories for street food vendors
- No standardised products/carts/Kiosks in India
- Lack of professional vendors and support from manufacturers, Industries, fabricators & designers.
- Less/little training and awareness about hygiene and good cooking/preparation Practices of vendors.
- Lack of hygiene to cart, vessels , equipment and surroundings

Problems & issues

There are various problems and there are issues which leads to these problems. For almost every problem there are issues, if we could figure out those issues, then we will be able to solve the problem. After the classification of data I have gathered together various problems and issues in the system. These problems and issues can be further categorized.



Different levels of problems

Which all problems I will be Focusing solving? And why?

Because of time constraint of the project and other limitations, I will not be able to solve or deal with all the problems and issues in this area. SO I have selected some of them based on the complexity and other aspects, they are mentioned below,

- Aesthetics and form of the cart
- Ergonomics related problems
Workspace layout and dimensions- to make it good,
Storage space and other provisions accessibility.
(Include comfort, ease of use, increased productivity and Performance, aesthetics & safety.)
- Visual hygiene of the cart and provisions for the vendor to practice hygiene.
- Consideration of other equipments and accessories for added value
(Aspects/features which can help vendor , customer and the public)

How to tackle other problems and solve the issues.

Other major problems include the hygiene of vendor, good practices to be followed by Vendor, Customer, law enforcing officers, and others. Awareness programs and other activities have to be conducted. Other stake holders in the system also has to help and support the system in different manners

Why a Industrial Designer

Why designer has a upper hand in solving this problems. What happens if this situation is handled by others.?A customer, vendor, manufacturer/fabricator? System or somebody else.

Designing a cart involves looking at various levels of system and stake holders , collecting data, analyzing , idea-ting and proto-typing and mass manufacturing with a plan. Only an industrial designer can consider the various aspects of ergonomics , usability of the product/accessories/space, and aesthetics of these common mass-produced items and works to improve the design, increase the efficiency & functionality.

A vendor has limitations, he can only do adjustments in his cart and he should know good ergonomic practices, good understanding about aesthetics. He should also should have understanding about materials which are good and safe. Similar with the case of manufacturer or fabricator.

Chapter -2

Define

So in the discover stage we have found some very good strengths and problems of street foods. In this stage I will be defining what I will be doing and who all will be targeted.

So I got a rough idea that, one structure cannot solve the issues which are there in the current scenario. So the product has to be a kiosk + equipments and accessories.

Design & Project Objectives

A Design project to Support & Enhance the potential of street food industry in Urban India.

The new cart should not decrease the variety/Diversity

The project doesn't intend to replace the vendors at the "bottom of the pyramid"

The product is intended to be like a "dérailleur" to shift-up the level of vendor's status and business condition. It will be like a standard product with different options/possibilities to be able to be used by any vendor who wants or any potential customers.

Design Brief

To design food kiosk and system of equipments and accessories for an urban street food vendor who wants to upgrade his business.

- It should have basic provisions for cooking, preparation, waste storage, storage space for food, equipments, drinking water.
- It should have a flexible workspace which can be used for 4/5 different varieties of food.
- The workspace should be ergonomically good
- The kiosk should be able to close completely at night.
- It should be able to clean and maintain with minimum effort.
- It should have mobility
- Price should be under 1 lakh.
- The cart should be able to dis-assembled and send it in a box, from manufacturer

Target user	Target Customer	Amount of customers	Target food type
• Vendors who want to upgrade their business	• Middle class	• 100 people	• Snacks – Wraps and Rolls

Vendor

So basically I will be targeting the street food vendors who want to upgrade his business. Those who have some money around 1 lakh. Either ready cash, installment, loan or any other means. So even if the vendor is selling some other food item he is welcome to buy and use this cart. This way there will be less prerequisite for the product. If I position my design to a particular kind of cart or vendor then only that section can only use. But I want my design to be accessible to a larger section of vendors. This is part of my product design objective. Hence the criteria is such.

Customer

Middle class - people are targeted as the customer category. They are the largest in number and have good spending potential, but not extreme. They are very adaptable.

Factors deciding the type of food(what food I am suggesting to be cooked/prepared/sold in my Kiosk)

How much money a vendor can make, how easy/complex to prepare, what all equipments and accessories required, how much space required etc.

Number of people

The cart will be designed for around 100 people. The number is a round figure it could be a little bit more or less. The idea is , while deciding the number the vendor should be able to make the profit such that he can repay the amount which he invested in the cart and still can earn something extra.

Target location for product

The intended area/location for selling is streets, roadsides, near transit nodes, public spaces where people gather, tourist spots etc. The choice is up to vendor, but the vendor should vend or sell at places where vending is allowed. In some cities and areas there are locations/spots which are identified by the government for street food vendors.



Food

Ingredients - Raw materials(General)

Refined flour (maida) for rotis

Vegetables : Carrot, Green peas, Ginger, Green chilli, Potatoes, Fresh coriander leaves

Masalas: Red chilli powder, Salt, Garam masala powder, Dry mango powder, Turmeric powder

Oils

Additional Ingredients

Egg, chicken, panner, Aloo, Other vegetables

To Serve

Chutney : Green chutney , other desired chutneys

Onion sliced

Vinegar

Chaat masala

Sauces : Tomato, soya sauce, chilli sauce etc.



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Other Food Items

Other recommended food items include Dosa items, snacks like Pav Bhaji, Kachori, samosa, Baji, Vada paav etc. These Food items are easy to make and doesn't involve complicated steps. Also similar(not same) equipments can be used, the space which we have provided will be enough for these. It will be also profitable for the vendor. Vendor can choose even small and simple snacks like paani poori, or other chaat items but it is up to his choice.

Potential buyers/users of my food kiosk



A street food vendor who wants to upgrade his business

A small cafe owner who can't continue to run the shop due to heavy shop tax.

Hotel/Restaurant management who want to sell their food far from the shop.

A graduate student/professional in cooking/culinary arts who wants to practice and earn some.

A housewife/common man who knows cooking and wants to earn some money.

While coming up with a new product what will be the requirements?

What are the reasons for selecting particular aspect or what will be the criteria? Which all features are essential & which of them are luxury?

So from the primary and secondary study I have found out that Different vendors are having different cart and kiosks, and have different equipments and accessories. Some are using lots of space and resources while some use very less space and equipments and accessories. So I have chosen the aspects and features based on cost of cart, size of cart, type of food etc. I have tried not to include costly features like refrigerator, wash basin and provision of water for washing hands etc

Aspects/features - for the kiosk

- Cooking space/area/equipments - includes stove or cooking accessories and fuel storage space
- Preparation space
- Storage space for vessels, accessories, equipments, food items, raw materials , personal belongings etc.
- Space for storage of drinking water
- Storage for money and valuables
- Dustbin - provision for throwing waste
- Stool/chair - provision to sit/rest
- Light - led for night time
- Icon board for the items available
- Menu board
- Shop name and vendor details board
- Kiosk number plate
- Reflectors etc.

Validity criteria or product Evaluation criteria

How does one say that the product is good or not.?

Well, to say that my kiosk is good or not , there are two ways.

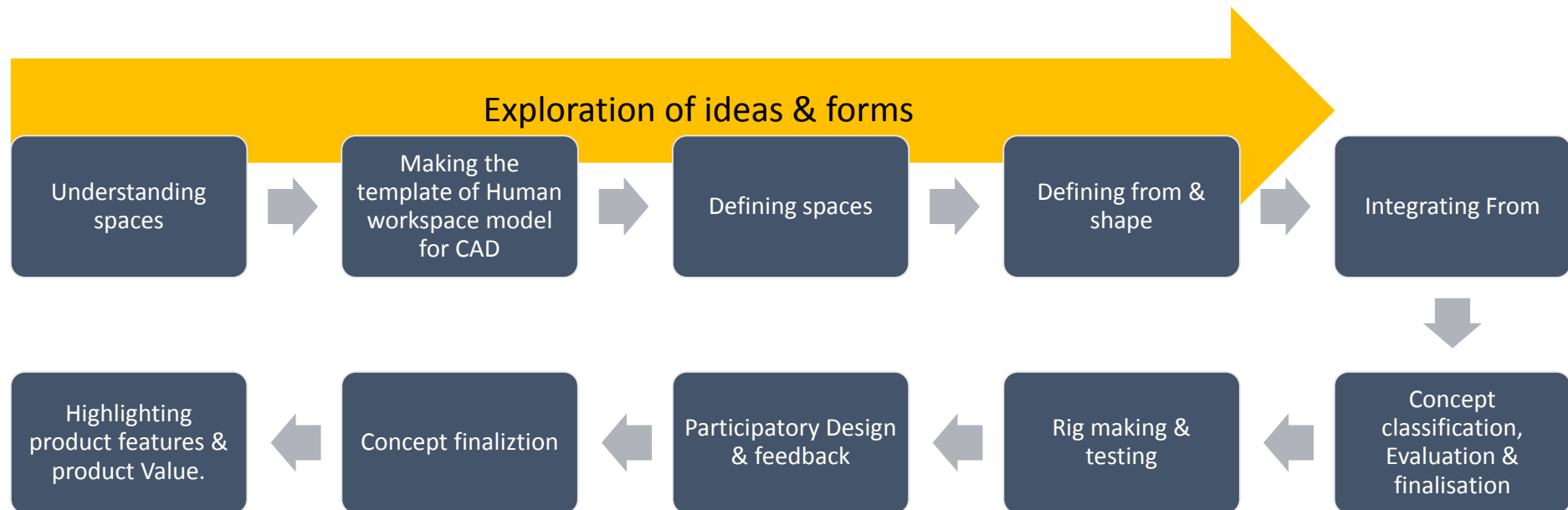
One method is to compare the features of existing kiosks in the market ,But the problem with that is there are no enough benchmark products in India which goes with my product brief. Second method is analyze through the “eyes” of Vendor, customer, public, and the LAW to see how much value it has. Again without having a comparison it is hard to evaluate . So one need to use both methods to compare and evaluate the product. Below I have written down aspects which can be used to analyze and compare.

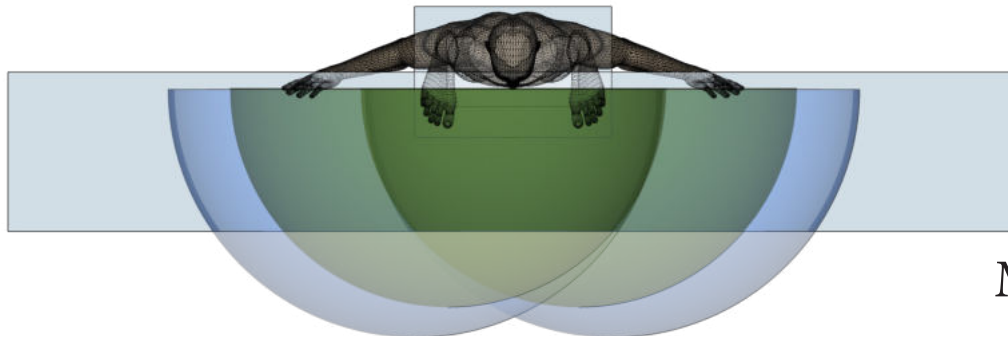
- Price
- Basic provisions-cooking space, preparation area, storage space.
- Modularity-flexibility of workspace
- Design in Indian context
- Return payment

Chapter 3

DEVELOP

In this stage, development of the product-kiosk, exploration of forms, defining of spaces, etc. Is done. At times I revisited some of the street food kiosks and reassured some of the aspects where ever there was confusion. Insights from vendors ,sellers, customers was used during the development of kiosk. Participatory design with the vendor was done after the finalization of concept.

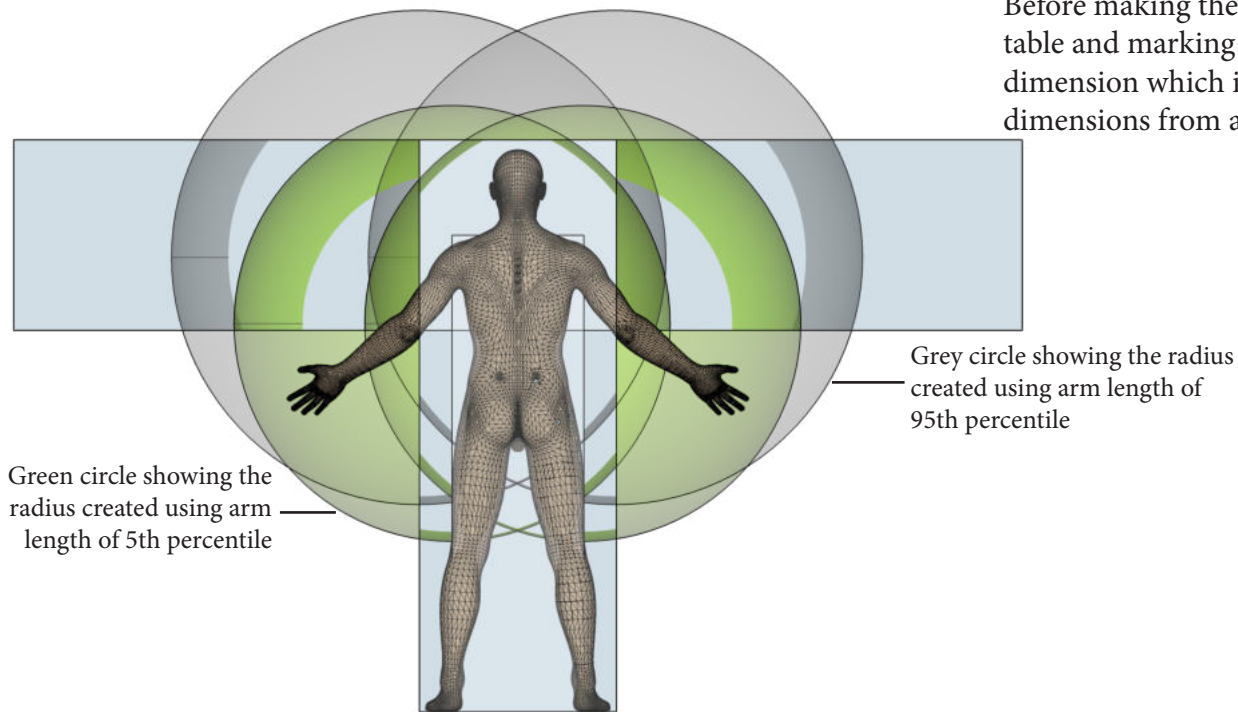




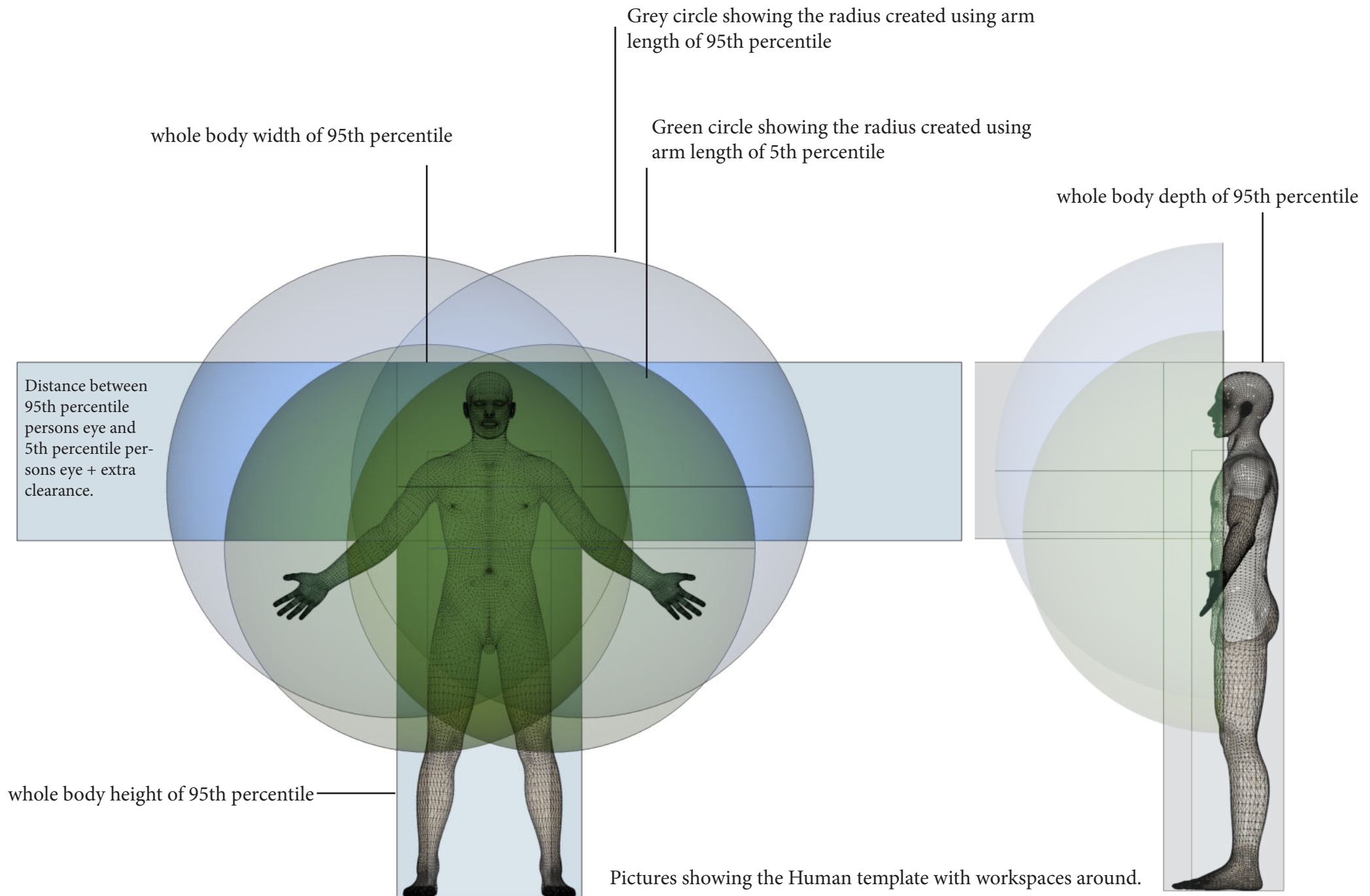
Making a Human workspace template

Understanding space

Before making the template I did role playing of a vendor, using a table and marking the spaces roughly. Then I listed the required body dimension which is required to make the template. After getting the dimensions from anthropometric book i created the virtual model.



Pictures showing the Human template with workspaces around.



Ergonomics

So earlier in the “Discover”stage we have found major problems related to Ergonomics. I have mentioned them as points below .

Bad postures

Long time standing

Bad lighting conditions

Bad space layouts and improper equipments

Requirements

- The Kiosk should be optimized to reduce the amount/number of movements.
- The Kiosk should be flexible for different activities.
- Kiosk design should fit the variety of workers shapes and sizes.
- Different tasks should require different work surface heights.
- The design of the workspace should be such that vendor should spend less time and energy in bending, twisting, lifting and cleaning so that the vendor can involve more in cooking and resting.
- The reach of any space should be designed for 5th percentile
- Preparation activities should be at lower level and cooking top should be at higher level.
- Washing should not effect cooking/preparation activities badly.
- Spaces or equipments should not hinder while moving from one frequently used space to another frequently used space.
- There should be good lighting at poor atmospheric conditions.

- There should be provision for shade during daytime and should protect the vendor and interior of kiosk from rain and dust. The shade should be sufficient enough to withstand medium rain with 60 degree angle.
- Wherever loading/unloading of heavy object is used the storage space or the surface height should not be beyond the reach of 5th percentile.
- The storage spaces should be able to be reached by 5th percentile vendors.
- The head space height should be designed to accommodate 95th percentile people.
- Handles of equipments should be able to be used by 50 percentile people.
- There should no be any sharp surfaces on objects/spaces in vicinity of frequent work.

Basic ergonomic checklist of good design

- Comfort
- Ease of use
- Productivity and performance
- Aesthetics
- Safety

Space(1600mm X 950mm)

Defining the space

While Designing the kiosk the first aspect to freeze or fix is the space. The volume which it will occupy. There are different considerations for this. We have to look from vendor's point of view, customers point of view and the public.

Law and regulations

The Law doesn't allow a vendor a space of more than 2Meter by 1Meter. Whatever cart or structure should be within the dimensions. This is to avoid people coming up with large structures and will consume space in the streets.

Ergonomic Consideration

Number of workers/helpers/operators/vendors per cart - ONE

The size is mainly decided by looking upon this criteria. In this project I am considering one vendor to use the kiosk. Based on the Anthropometry, 1600mm is found to be an effective size which can be reached by a 5th percentile person with 5th percentile arm dimension, while standing in the same position. The width 950mm is fixed by adding extra length to the effective reach from the standing plane of the vendor.

From the primary study

The study has showed most vendors use cart/kiosk dimension around 5ft by 3.5 ft(which are operated by single vendor)

Environment Consideration

This has secondary priority, small streets of Indian cities, busy streets, traffic blocks, effective utilization of space etc.

Mobility consideration

If the vehicle is more compact it is more easy to handle and will have less weight, so easy to push/pull.

Type of food & required amount to prepare.

If the cart is so small than 1600mm X 950mm, the vendor cant make or store enough food items and other miscellaneous items.

What if we take more space than 1600 x 950 mm? What if we take less space than 1600 x 950 mm?

The cart dimensions can be altered+/- 50mm(2-3inch) in width and +/-400mm(13-14inch) in length.

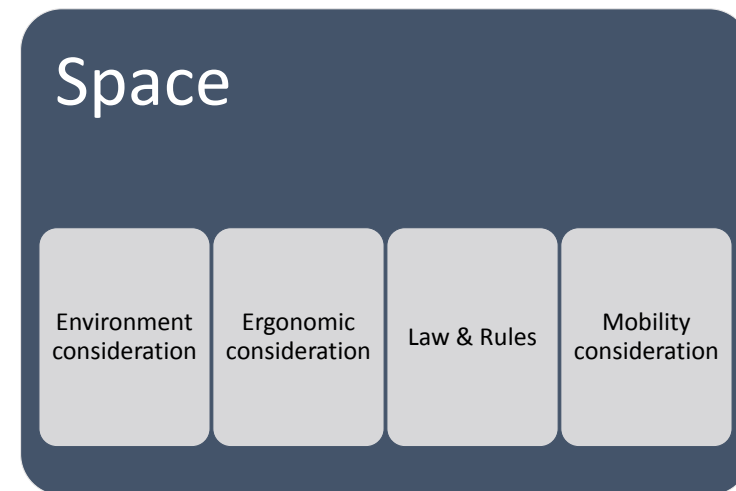
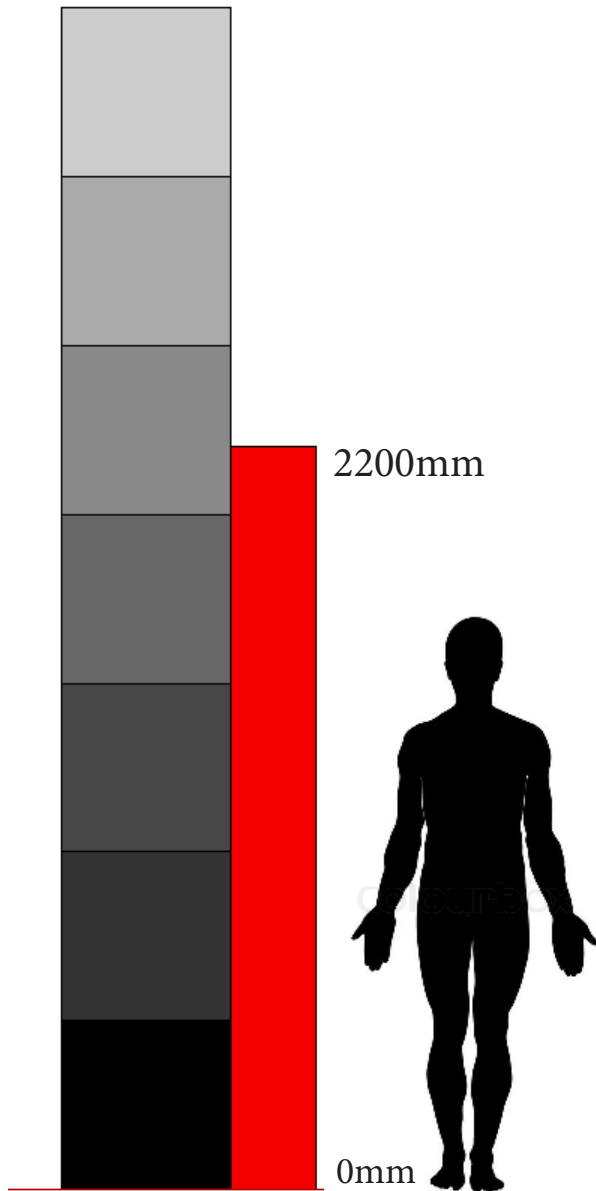
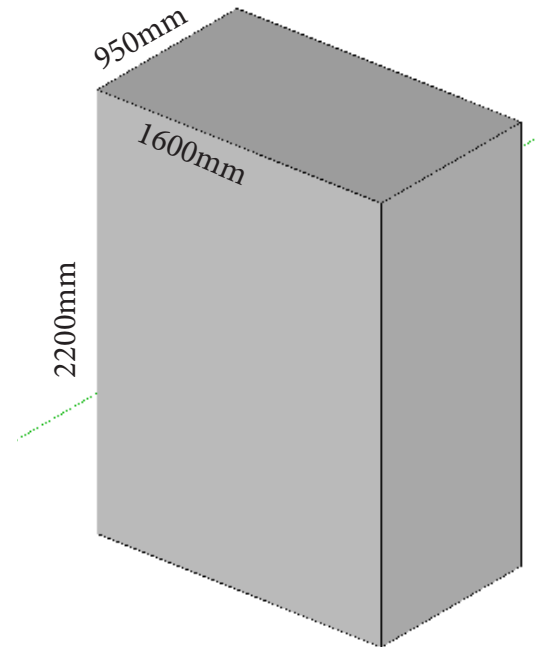


Figure showing major factors influencing the defining of space for the kiosk



Height of the Kiosk (2200mm)

The height 2200mm is considered with an intention of overhead storage space. This space will be used for storing raw materials of food, accessories and equipments which are only required once in a day. This space will be at an height of 1900mm from the ground level. A stool/chair will be provided to access this space.



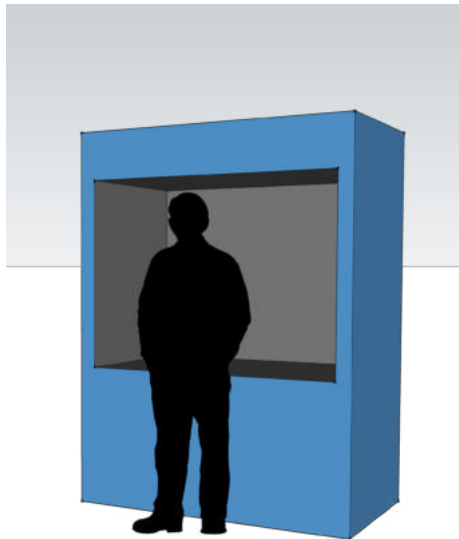
Cart opening/accessible ways

From the study I have found different carts are having ways of accessibility. But the majority have 4 way opening.

One way opening

Advantages: More space inside for storage, more protection from sun, rain and winds. Only need to focus on one side.

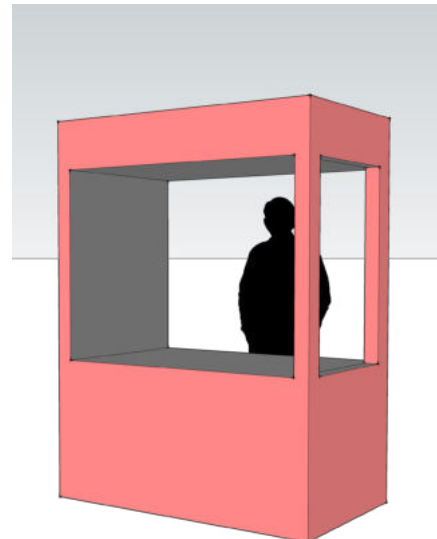
Dis-advantages: less opening to serve to more customer during peak time with more customers. Creates blind spots around the cart



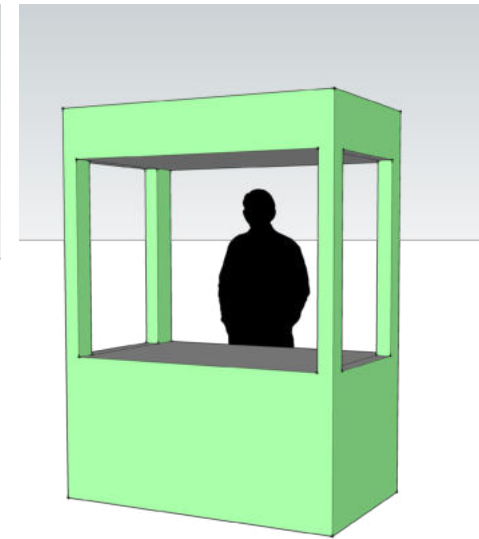
One way



Two way



Three way



Four way

Note: The images shown above are for representational purpose.

Four way opening

Advantages : has more advantage while there is a peak time rush. Many people can get food and wait around the cart for food.

Dis-advantages : But since it is more open on all sides provision of good shades should be provided to protect the food from rain, wind and sun.

Modified Four way opening, This will be used for my kiosk design. So provision of shades is important if there is 4way opening.

There are carts in which vendor stays inside, these are also good but the size will become more, more heavy, these are not good/friendly with wheels. In my design I wont be considering such types.

Mobility

Below is a list of all questions considered while deciding the wheels for the kiosk.

Why mobility? Floating, sliding, rolling, Hovering, .why wheels?
How many wheels?4.wwhy?
What kind of tire? What material? What size?
Does it need to lock the cart? Why?
What all advantage it has? If its not there what happens?
Does it need breaks to stop the wheels? Why? What all advantage it has? If its not there what happens? What are the rules and regulation Are the strengths? How much bad it is if there is mobility? Functional advantages, economic advantages. Vendor advantage. Customer advantage
Public advantage-system. Does it need any towing hook? Or part? Why How it should be?

Why Mobility?

The Rule suggests the vendors should pack and leave the site/ vending location once the trade is over. This will help the public area free for other activities during the other part of day. If vendors occupy the space even after the trade it will create block in public areas like , streets, roadsides, lanes etc. SO for transporting the cart/kiosk wheels are the best way to do the job. Hence mobility is integrated with the design of kiosk.

Advantages of Mobility

Apart from the suggestion/order of rule, Vendor and customer has many advantages if the cart have mobility. The vendor can travel around the city searching for the good crowd in same day/ different day. This will help him earn more. The same aspect will be helpful for the customer also. Parking the cart in a safe place at night is very crucial for the vendor. The mobility of the cart will help the vendor to achieve this.

How many wheels?

Four wheels are preferred as 3 would be less stable and 5 would be unnecessary. From the study about carts outside India, I have seen that some carts use two wheels and two metal stands/pegs to rest on ground. But these require a towing vehicle or should be too small and light weight to move.

Maneuverability

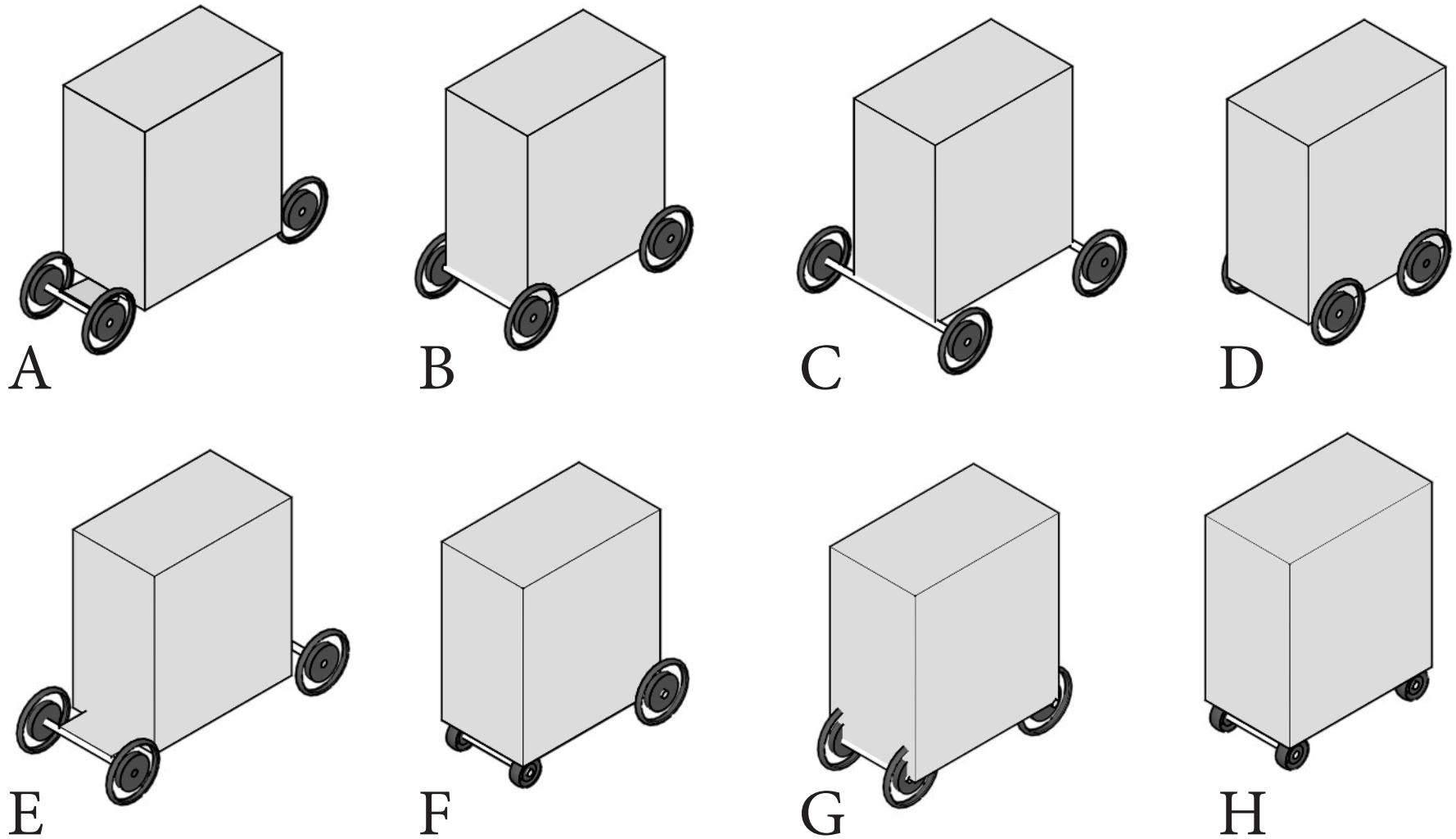
Since the cart will have weight more than one person could lift and turn , I will be providing maneuverability for two wheels for easy turning

Locking mechanism for wheels

The wheels will require locking mechanism in order to stop the cart in small slopes. Apart from the locking mechanism providing wheel chocks will be considered.

Tire position & size exploration

The images shown here are for representational purpose



After the tire position and size Exploration . I am choosing the configuration with two Castor wheel(~11inches) in one side and (~20 inches) tires on other side

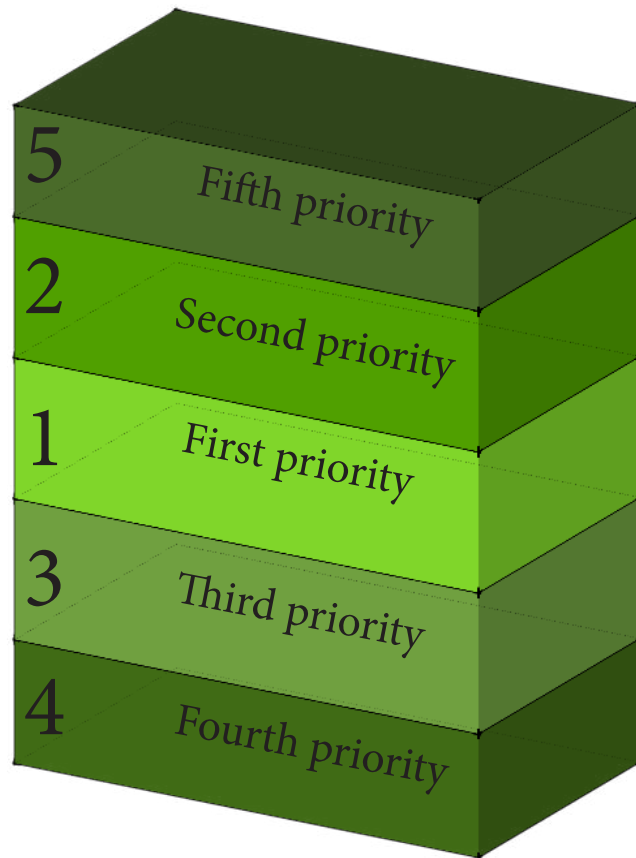


Figure showing usable space according to their priorities

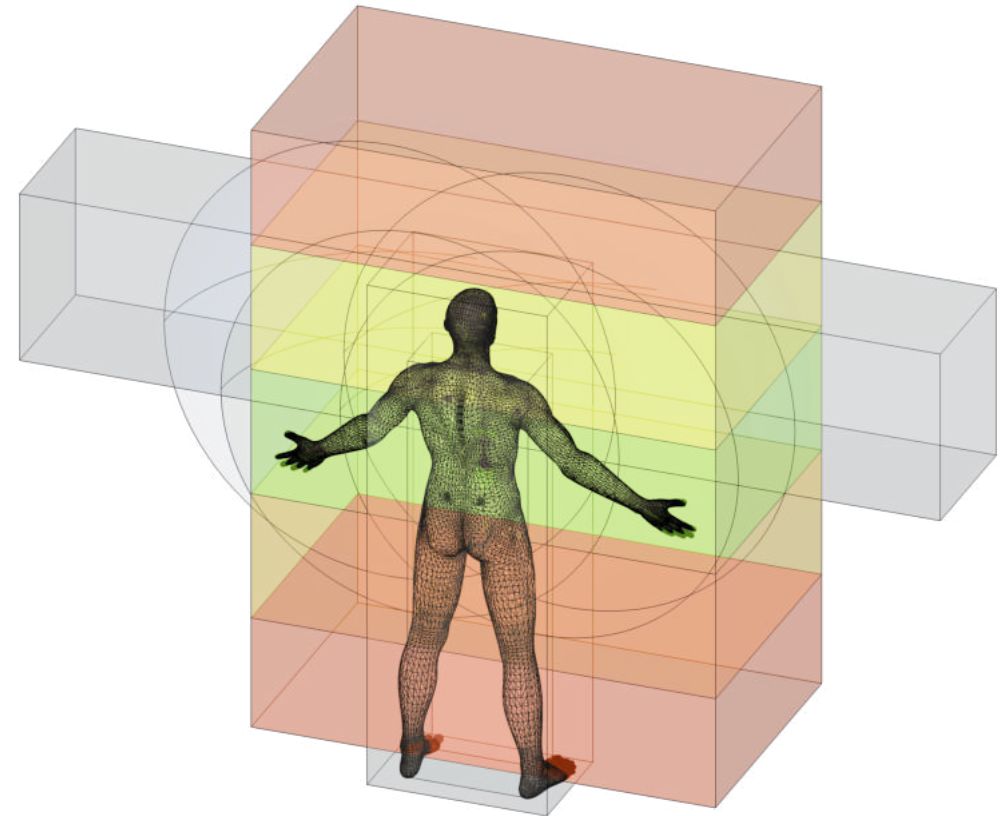
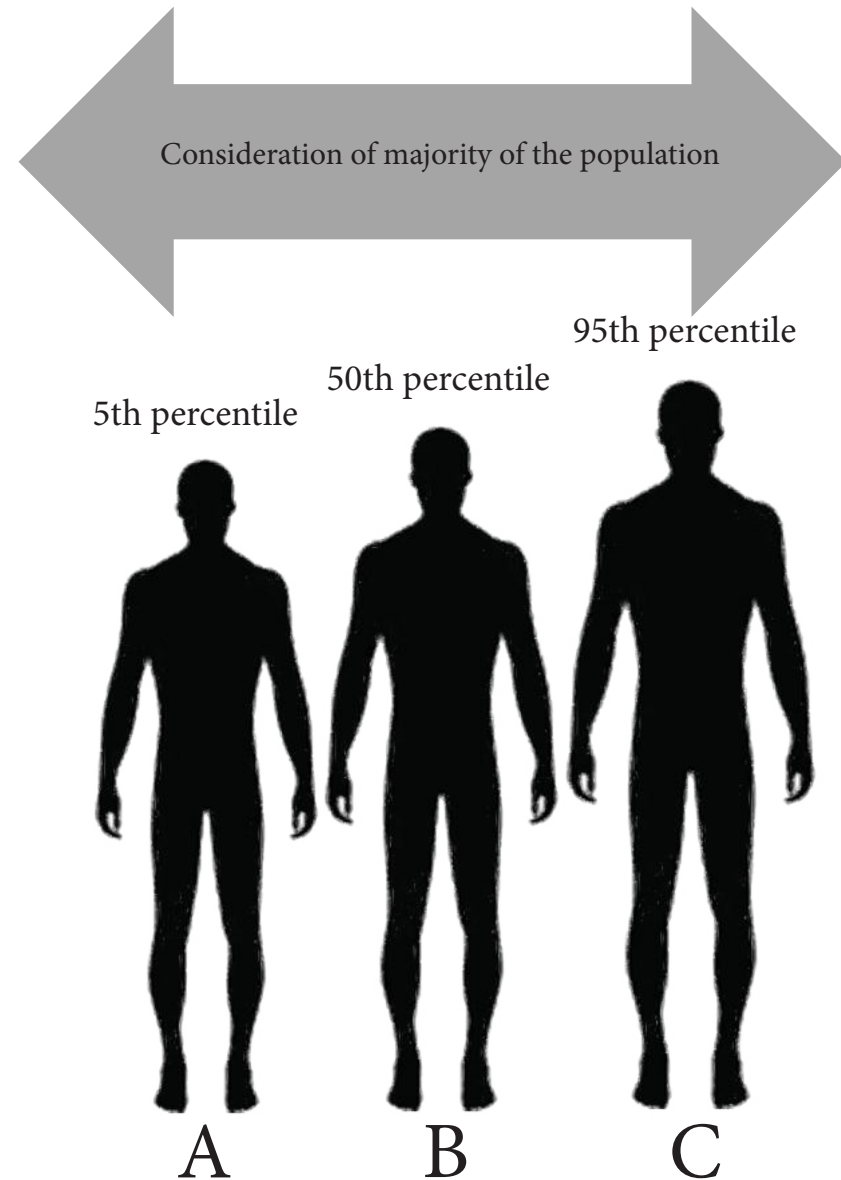


Figure showing usable space along with the template to mark the spaces.

identifying : Usable space

Height of the platform

Height of the platform is given **31 inches (~790mm)**. Usually standard height of the platform is around 34-36 inches (sometimes even more than 36 inches). The advantage of giving 31” is so that even people with low height can use the space without any modifications/alteration in cart. People which are above average height can use bushes or small stands to increase the height. Which will involve very minimal cost. If the height is given 36 inches then people with low height will face difficulty in using it and to decrease height of platform it will result in more complex mechanism and cost.



Cooking space

One of the important aspect/provision of the food kiosk. The cooking space is space provided in cart considering various aspects like nearness to storage of food, accessibility, equipments/accessories which will be used., Nearness to preparation space , nearness to vendor, nearness to customer.

Two burner (rectangle)

500mm X 350mm

Single burner (square/round)

350mm X 350mm

Cooking equipments considered for the cooking space. The Burners will be using LPG as fuel, or kerosene. Also single stove (for dosa items) which uses charcoal is also considered .

After analyzing the advantages and dis-advantages of the different layouts, Type A layout is chosen for my kiosk design. This kind of layout will leave one side free for preparation and other activities. This will be enough for the cooking of the food items which I selected.

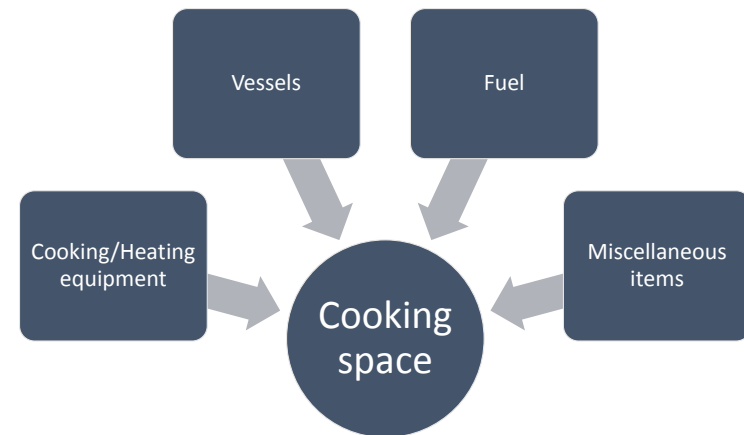
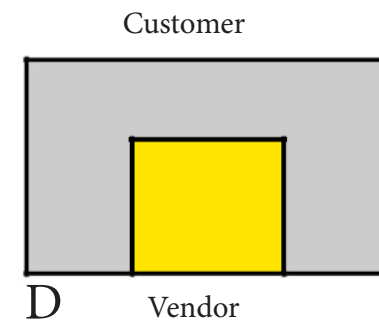
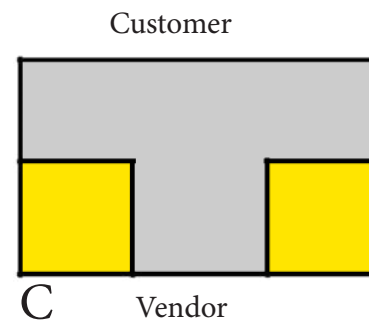
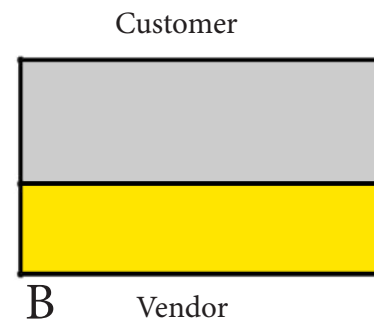
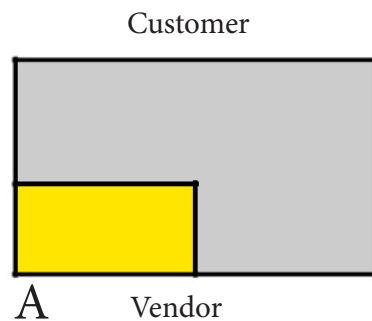


Diagram showing aspects which were considered while deciding and providing cooking space.



Exploration based on position and size of cooking space

Preparation space

Cutting board designed for the preparation area



This position will allow vendor to do activities like cutting, slicing peeling etc. The Height of the workspace will be increased in this position.



This position will allow vendor to do activities mixing, Activities which require pressure and strength. The height will be lowered and vendor can exert more pressure.

This way the manufacturer can make cutting boards of three different sizes for 5th, 50th and 95th percentile of the people, and the cost will be minimum. Also this cutting board can be used as a tray.

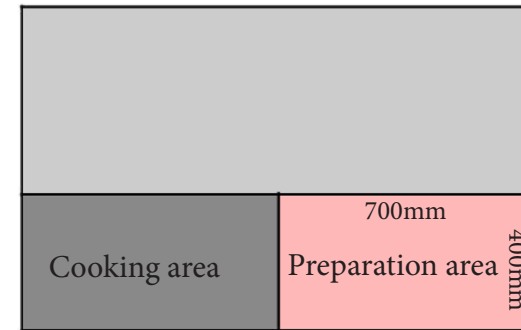
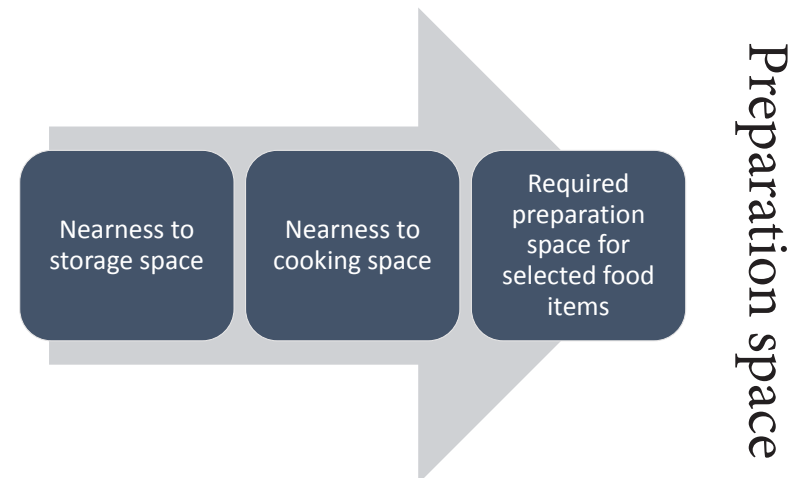


Fig showing layout of cooking area and preparation area



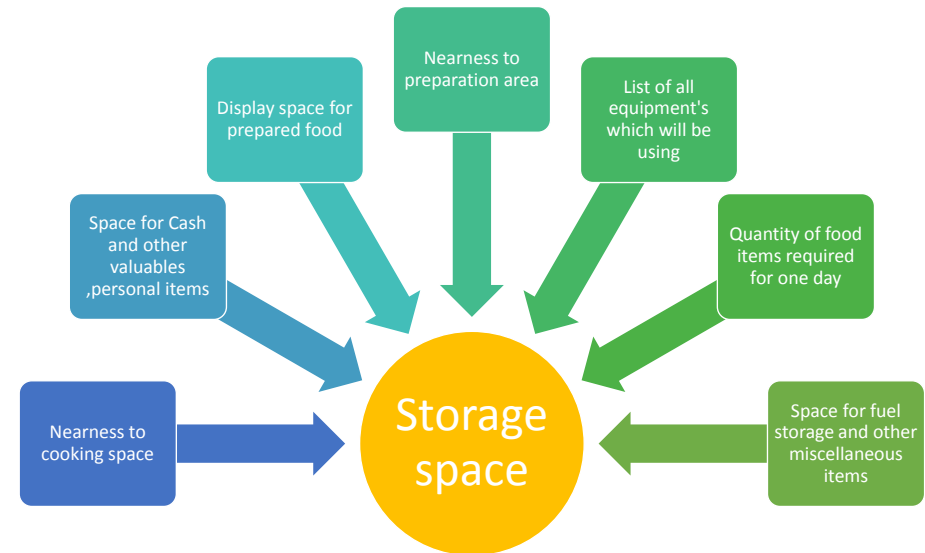
Storage space

Providing a good amount of storage space in the kiosk will help the vendor very much. Without a good secured storage space the vendor have to carry all the goods and equipments everyday or need to tie it somewhere near the trading location. When a vendor doesn't need to carry a lot of things everyday he will save time, energy and cost of transportation.

Storage space for each item is provided considering the amount of food required to prepare each day. The vendor can store each item sufficient for more than 1 day. While coming to the trading location or spot vendor can use his cart as a “shopping cart” and can store the required amount of goods. Thus he doesn't require additional help to bring the consumables.

Display space

There will be display space provided in the cart to display cooked food items. This will be an added value to the cart and vendor and at the same time it will help the customer to see and understand menu easily. This way confusion can also be avoided since the same food items are sometimes prepared in different methods. Display space for around 4/5 item food should be there. Also the space should not get effected by other activities. It should protect the food from dust, since dust can affect the visual appearance of the food item, thus affecting the business.



Factors influencing the design and provision of storage space

Storage space position are given above, on the work counter and below the work counter. The above-head storage space will be such that vendor keeps things which he requires only once in a day. Items which are required during the working hours will be kept on the work counter. Items which are required but only once in two/three hours will be kept below the work counter.

Representation of items which are required to store in the cart

(Size, shape and colour of actual products may vary slightly)



Paper cups



Paper plates



Vegetables and other ingredients



Small bowls, dishes, and other vessels



Flours



Spices and masalas (whole and powder)



Cutting, slicing, peeling, roti rollers tools etc.



Different types of spatulae and serving equipments



Egg trays

Representation of items which are required to store in the cart

(Size, shape and colour of actual products may vary slightly)



Water can for drinking



Tissue paper for cleaning hands (for customer)



Space for money box/cash storage



Can for kerosene storage



Charcoal stove for slow heating of curry/sabjis



Foldable chair/stool for vendor seating



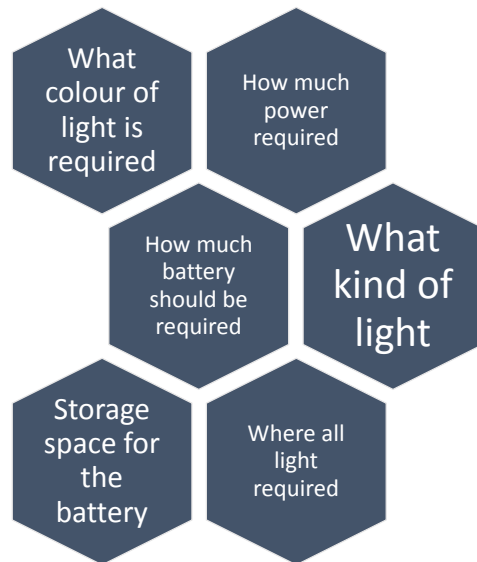
One cylinder of 5kg or 14.5kg or 19 kg



Dustbin

Light

Earlier in the discover stage , we have found that there are vendors who cook/prepare/sell food in low or sometimes no light. So to avoid errors/mistakes/accidents/miscalculations and to give a good atmospheric lighting condition I am providing LED lights in the kiosk. A Portable 50 VA 3 CFL UPS or higher grade UPS can be used to power the light. The advantages will be less power and fuel consumption, good light for vendor and customer. The cart will also get good attention in night. More lights could be placed in the kiosk according to the power level of UPS.



Factors considered for provision of Light in kiosk

Waste disposal

An important aspect which should be considered while designing the kiosk. Because there is no understanding of how waste management is done , many vendors dump the waste nearby and create environment problems and nuisance to public. A dustbin will be provided along with the cart and there will be storage space for dustbin. In the morning the vendor will take out the dustbin and keep near kiosk and in the night he will clean the dustbin into nearest public waste dumping area and keep the dustbin back in Kiosk.

So with the provision of storage space for dustbin and provision of dustbin along with the cart will help vendor to save his time, energy and money.

- Should be able to remove the waste easily.
- Should be able to dump the waste inside dustbin easily.
- Should be able to store the dustbin inside cart easily.
- There should be some lid to protect from rain.
- Also the lid should act as a barrier for smell, flies, insects and other things.

Consideration for provision of waste disposal (dustbin)

Water

Provision of space for Water for drinking will be provided in the kiosk. The space will be considered for 20L water can bottle or vessel of approximate same size.

Space for storage of tissue Papers(for Cleaning hands) will be given in the kiosk. Provision of Water for washing is not considered in the kiosk. Since it will create additional problems like, Where the water will go after washing?
if there are no provisions/vessel to collect that water, then the water will go to the roads and streets directly and will become dirty.

How much water will be provided? What if the customer misuses the water?

From where the vendor will get that amount of water?

In cities like Mumbai, getting water itself will be a big challenge for the vendor.

Water for washing plates

There will be provision of space for a small bucket to store water for washing plates and other accessories. The vendor have to arrange the water and use it very carefully such that he doesn't make the Surroundings dirty.

Others

Other features, like number plate-denoting the details of vendor and cart, menu boards, Shop board etc are also considered while designing.

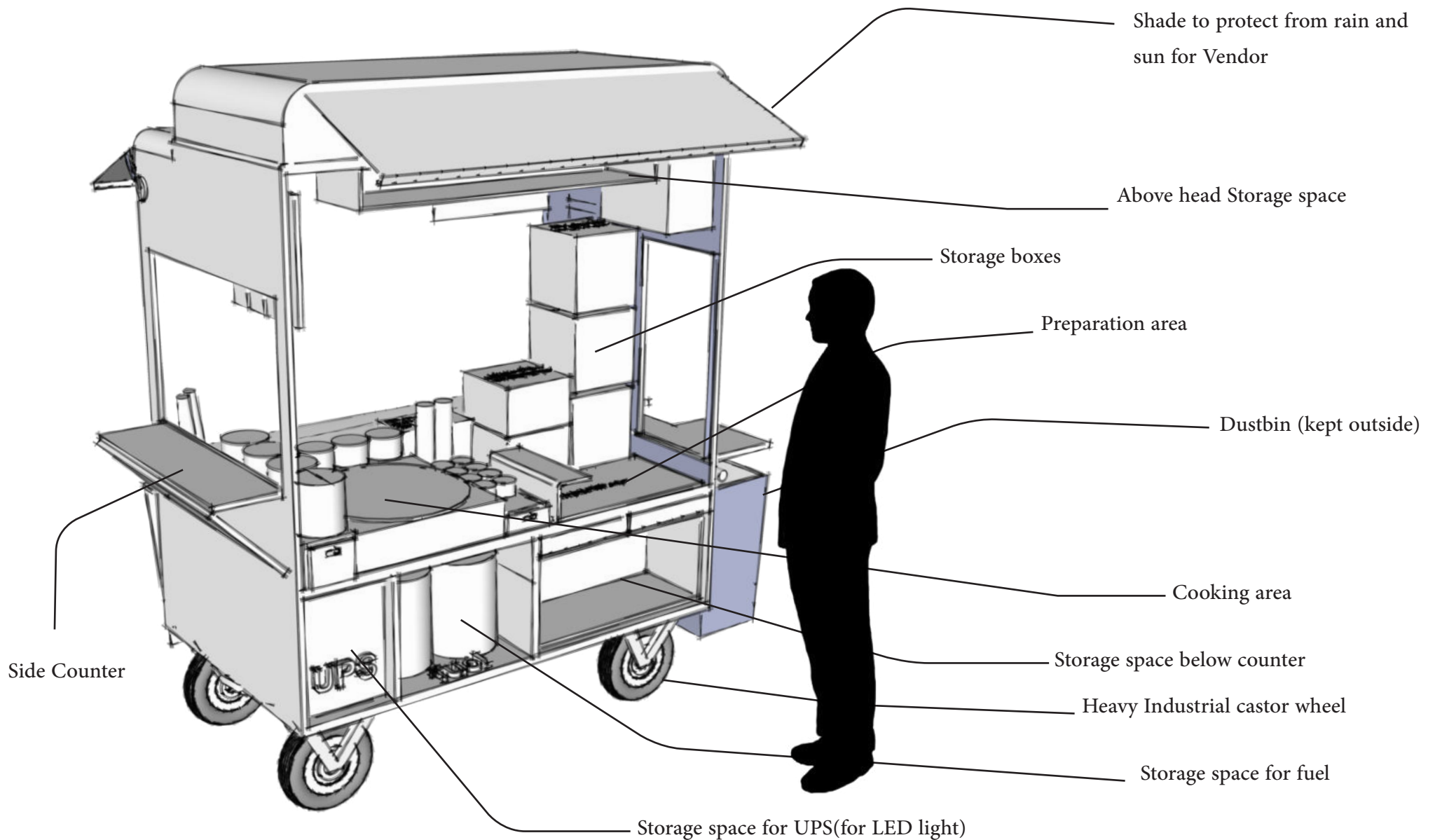
Number plate

This is an additional feature I have considered which doesn't exist in the current scenario. This will help customers to identify the cart which they "love to eat" and also help the organizations/officers to mark and identify the kiosk.

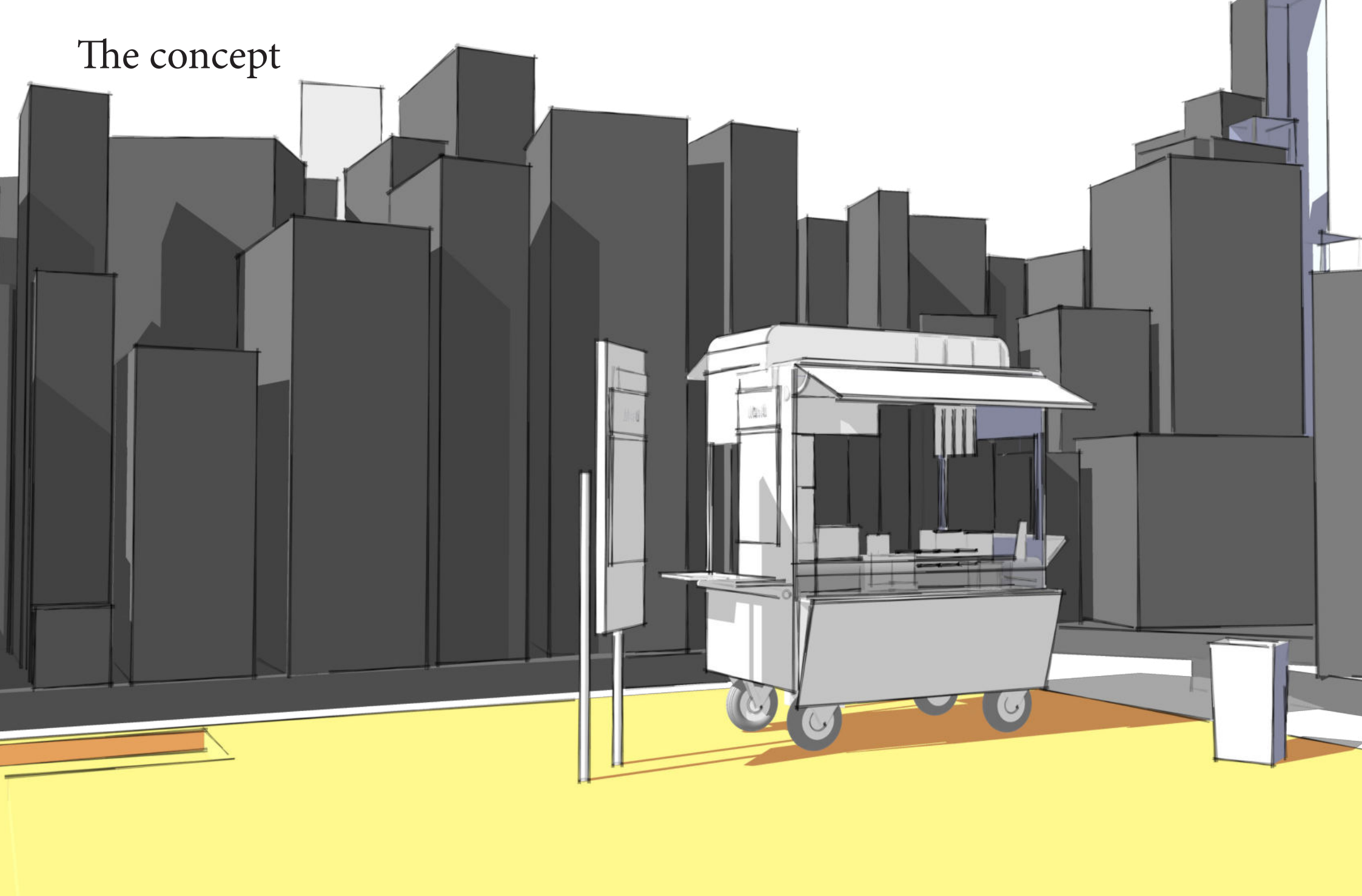
Menu board & Shop board

Provision of space for shop board and shop board is included in cart design. This will display the vendor details and shop details. Menu will be displayed on the kiosk so people don't have to ask "what is there to eat? This provision can avoid confusion and can speed up the business.

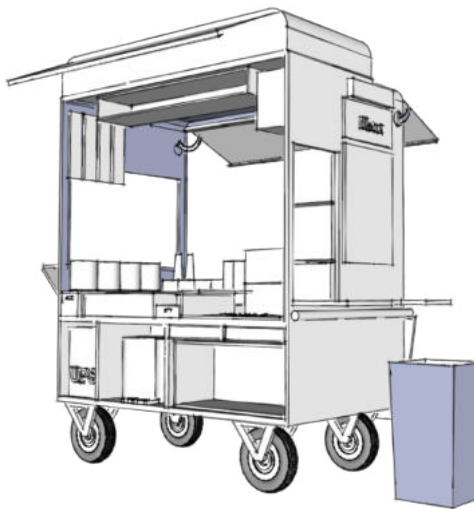
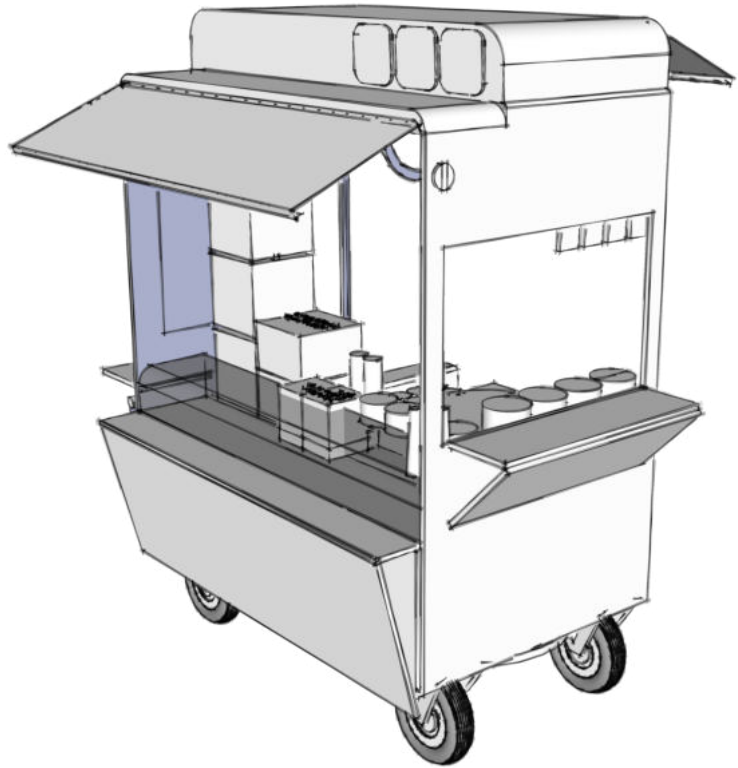
The Concept



The concept

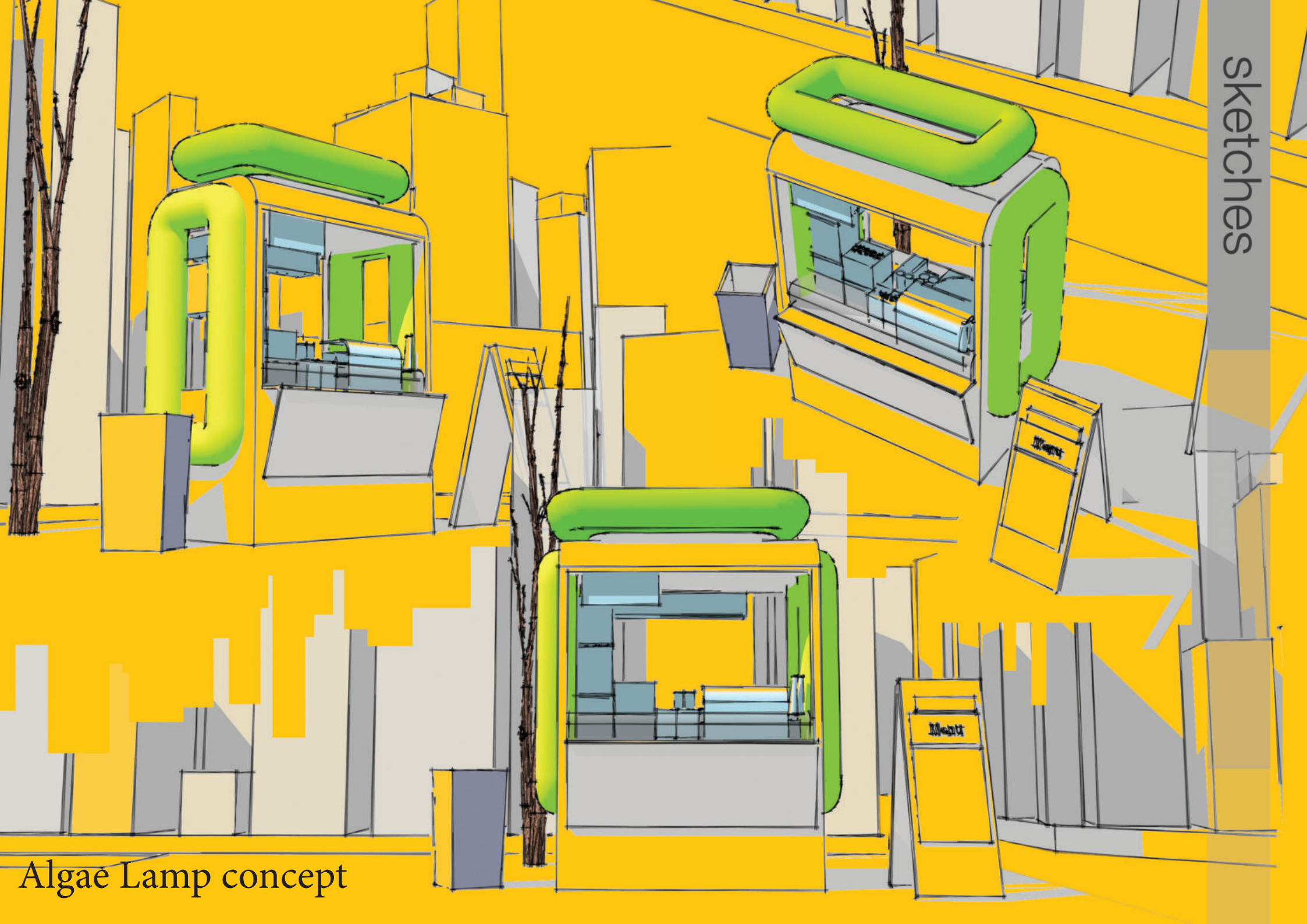


Different perspective views



Ideation & formal exploration

Ideas and exploration of concepts happened parallel y with the development of the spaces. After the development of spaces, the ideas were then integrated with the concept and analyzed.



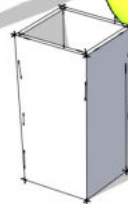
Algae Lamp concept

THE CONCEPT is there will be toughened glass tubes which will contain algae, and due to a Particular process they will glow, and will act as a lamp. A single lamp could absorb roughly a ton of carbon from the air in just one year — the same amount as 150 or 200 trees. If these lamps could go into mass production, they could go a long way toward fighting climate change and reducing air pollution. The technology is existing but i will be integrating this idea with the kiosks. Fun element.

These can acts as “small lungs” in Urban streets. A good step forward. Each kiosk will absorb CO2 nearby. Imagine more than 1 crore vendors in India with this?

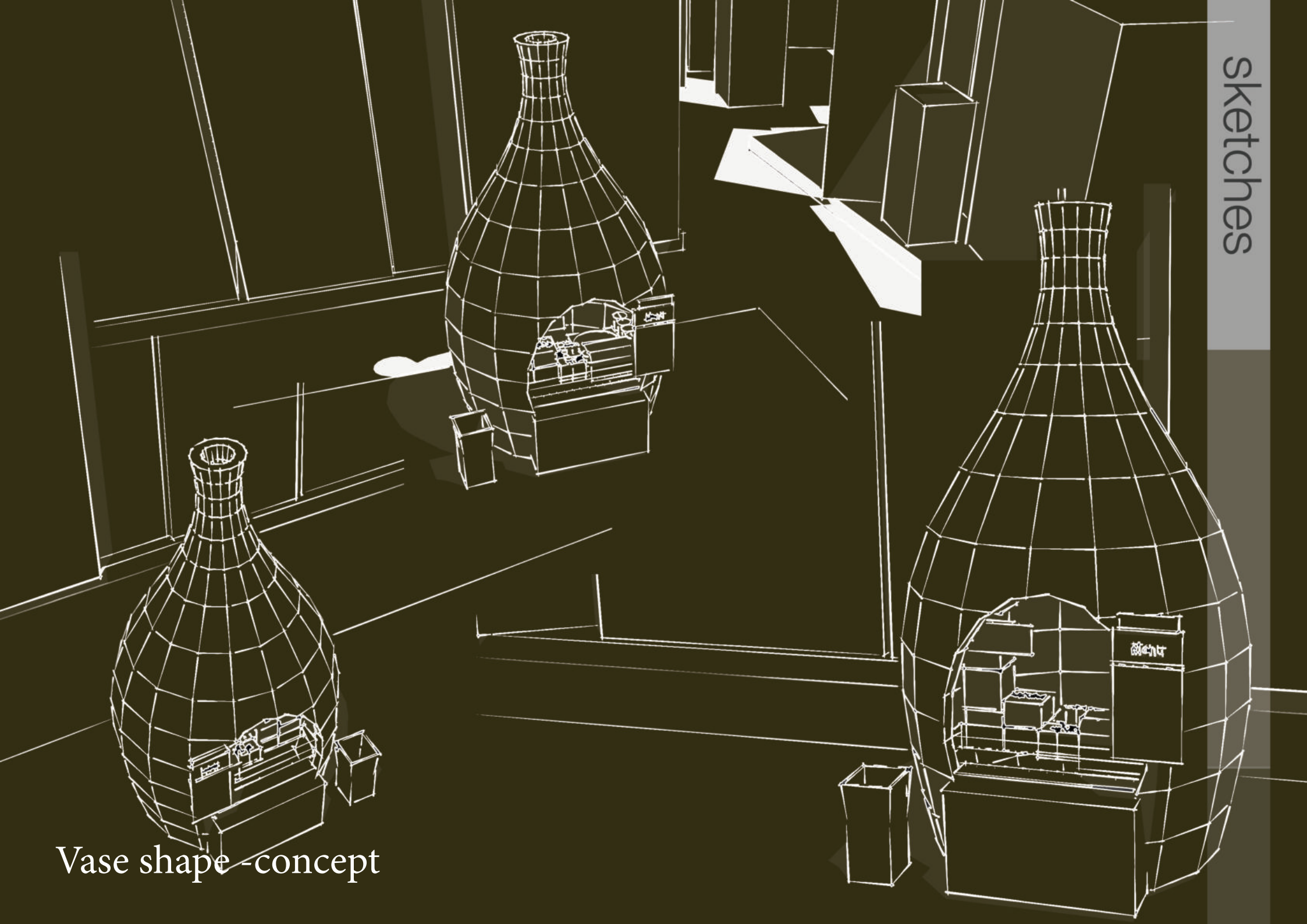
Algae Lamp concept

To give back something to nature.



CONS

Weight might become more. Tubes might become costly

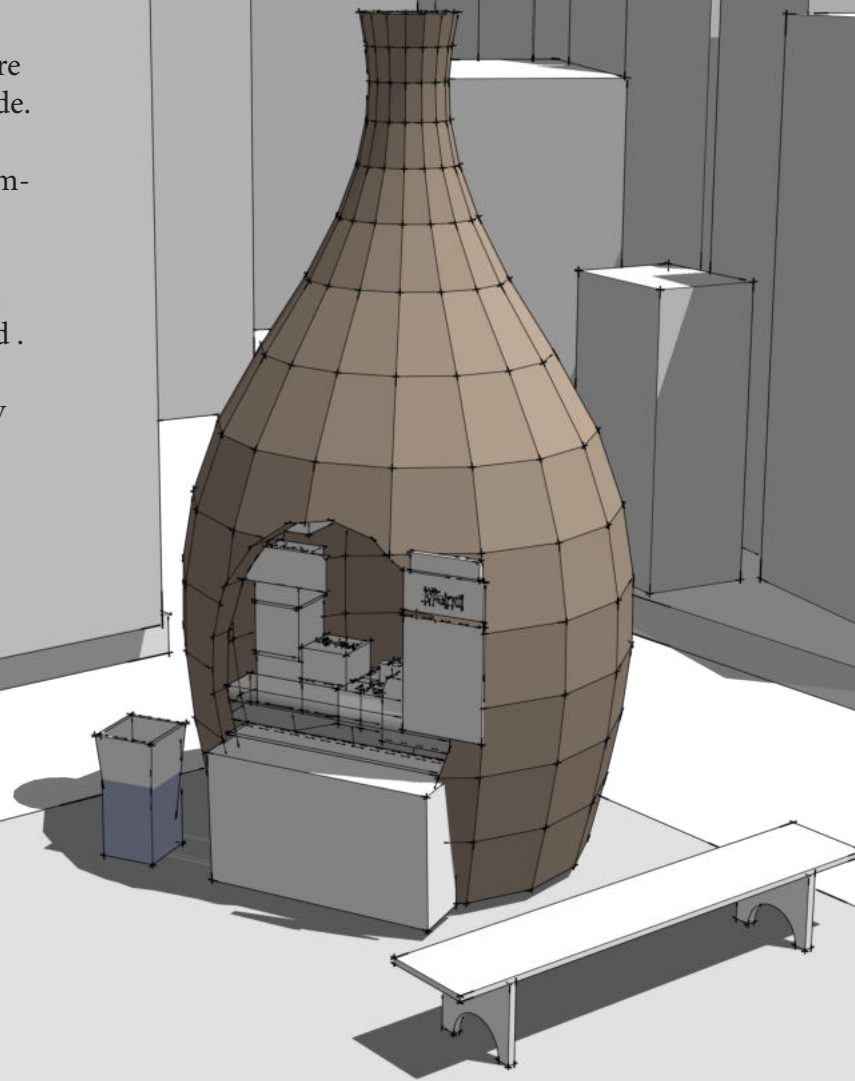


Vase shape -concept

THE CONCEPT inspired from Weaver birds nest , the shape of a vase. There will be good ventilation for the vendor inside. Tall structure. will help to get noticed. The main frame will be made used cane and bamboo, daub and wattle will be used for walls.

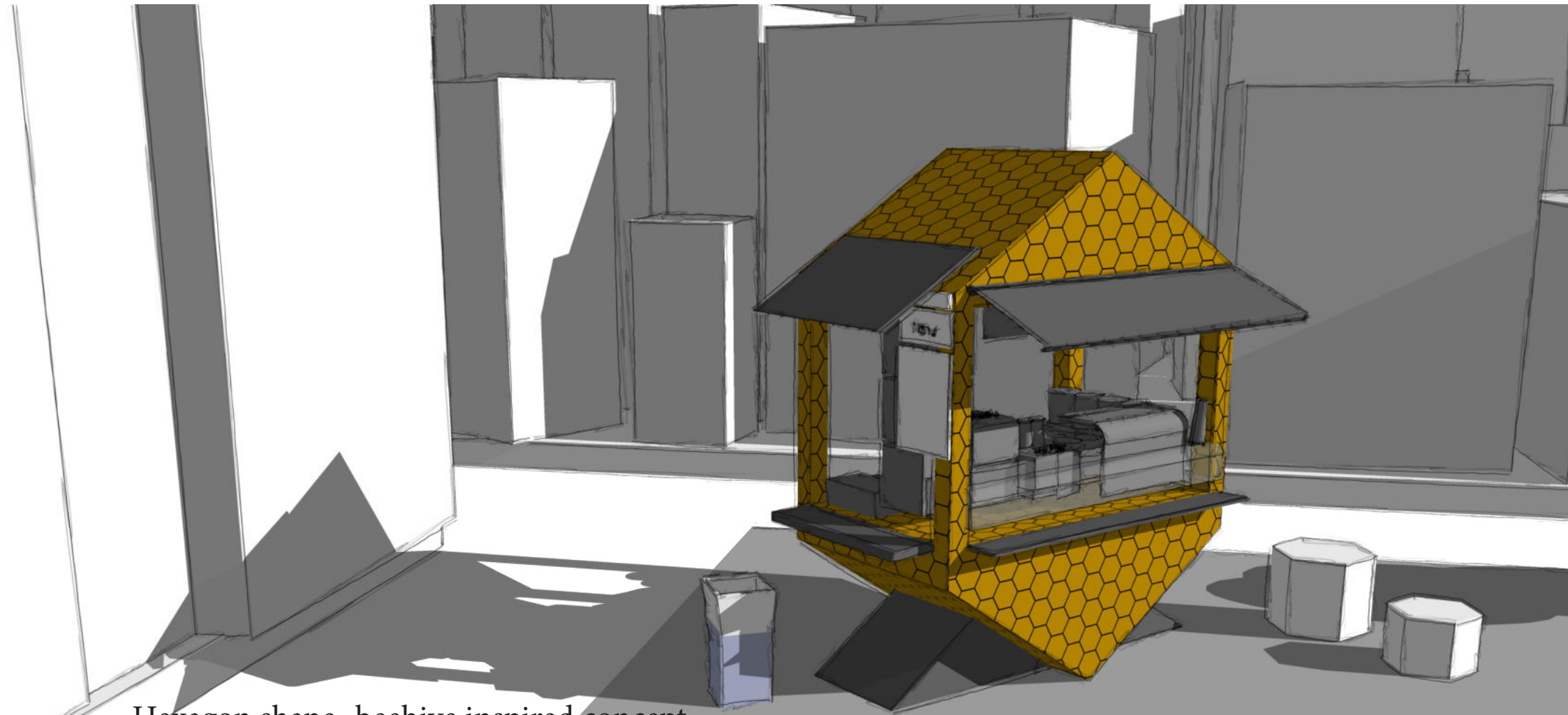
But, it will work mostly in hot dry climates, where the vendor needs shade all day round .

Will be very contrasting with the urban city language.





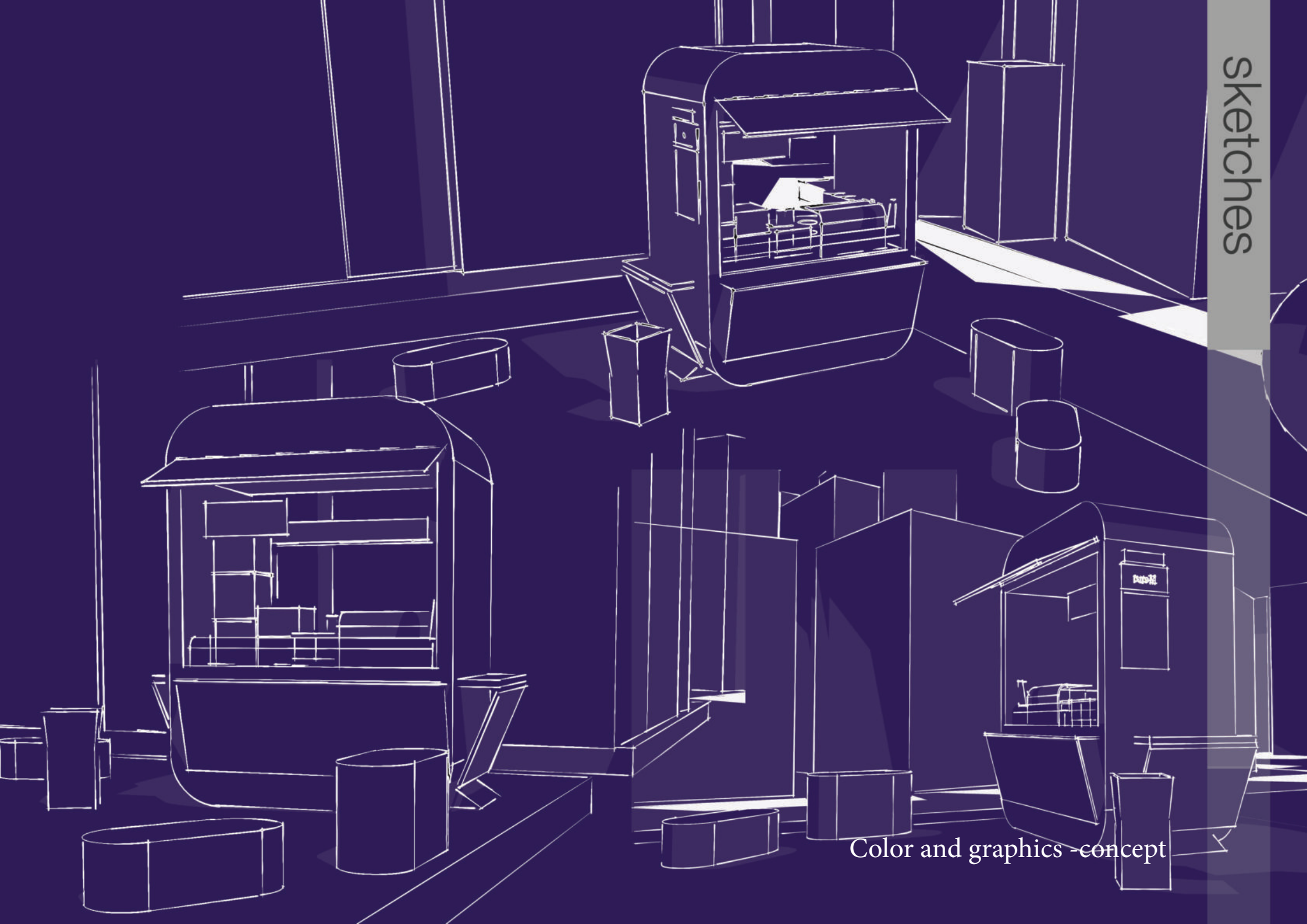
Hexagon shape- beehive inspired concept



Hexagon shape- beehive inspired concept

THE CONCEPT inspired from beehive Cells. The structure of the cart will be hexagonal in shape. Each cells will be made up of solar-cells. The shape will give good strength to the structure.

Sweets would be a nice options to sell with this concept.
Noticable form and shape.



Color and graphics -concept

Color and graphics -concept

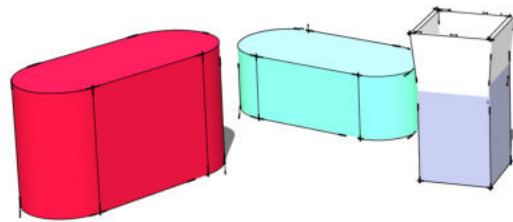
THE CONCEPT

The cart will be finished with colour and graphics, on simple form. Vibrant customized colors and graphics will be used in this concept.

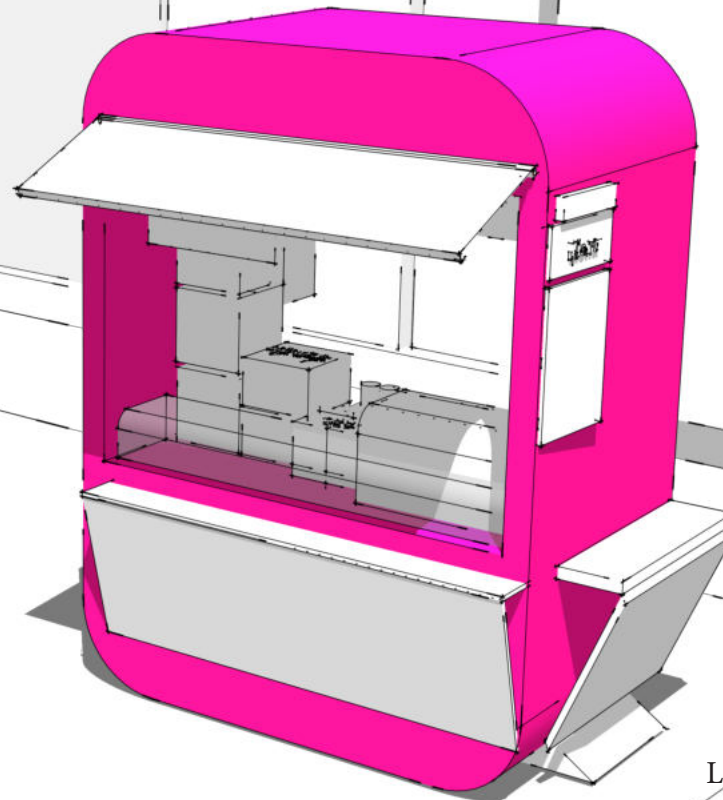
It will be highly attractive in colour.

When a vendor buys a kiosk he will get a chance to select the desired colour he wants. That colour will be saved in the company for ever long. Whenever he wants that colour he can use it. Imagine each vendor can have a unique colour and graphics.

There will be panels where vendor can stick the graphics.



Apart from the customizability of colour and graphics, the parts individually can also be painted.



PROS

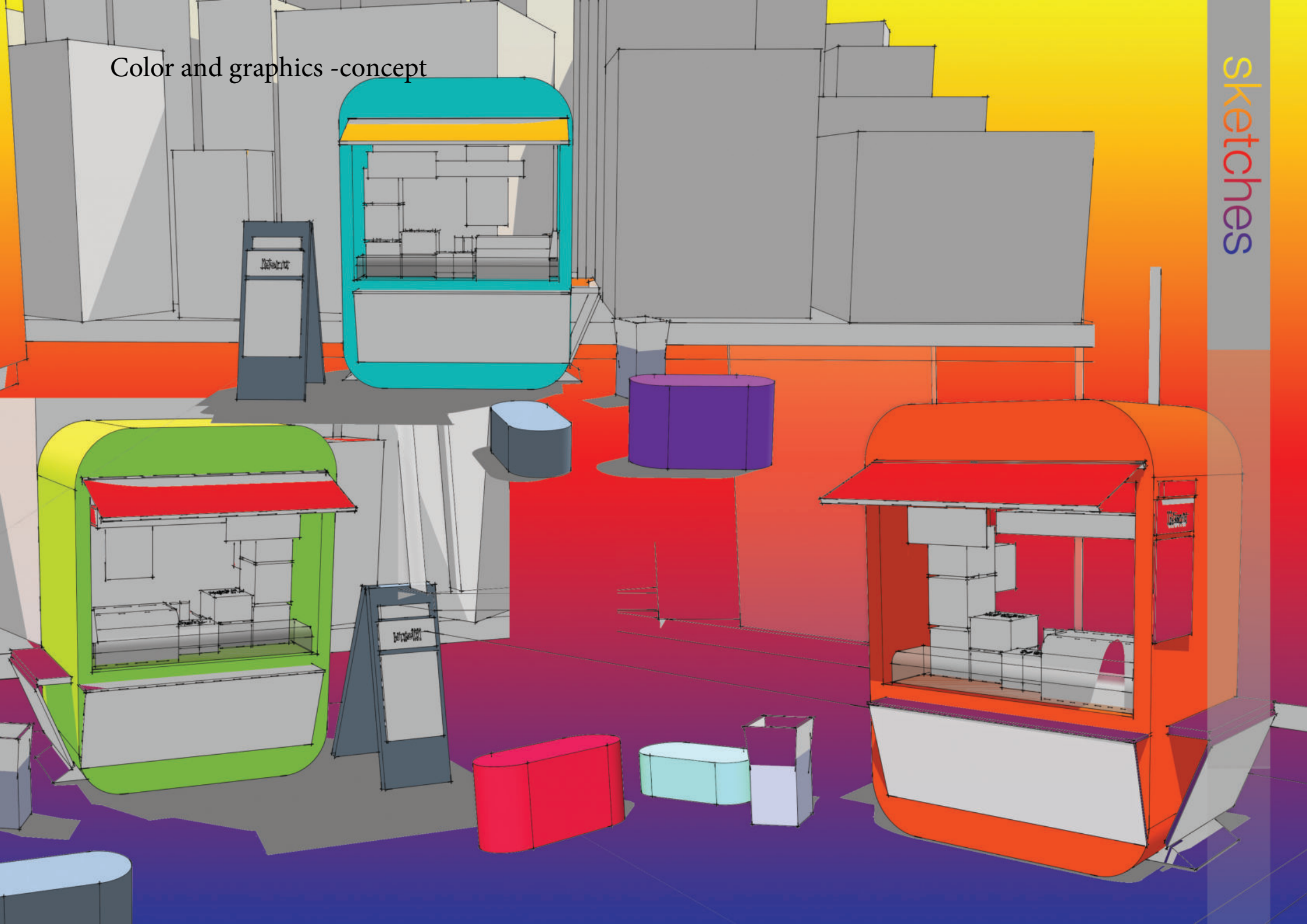
Less cost & simple technology.
can be very attractive & noticing

CONS

Doesn't have a fun element in the form.

Color and graphics -concept

sketches





Abstract shapes concept

Abstract shapes concept

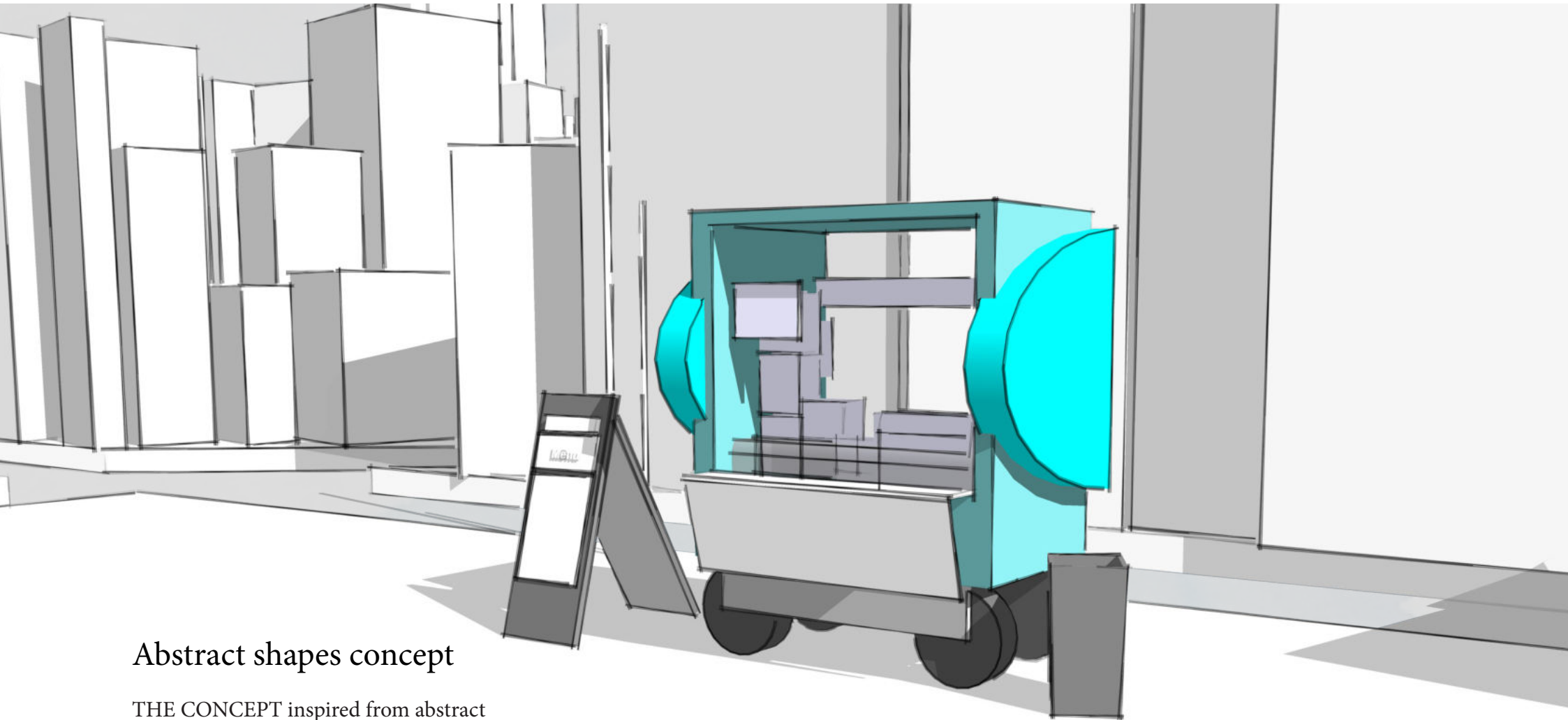
THE CONCEPT

Abstract shapes based exploration.



[illegible]

sketches



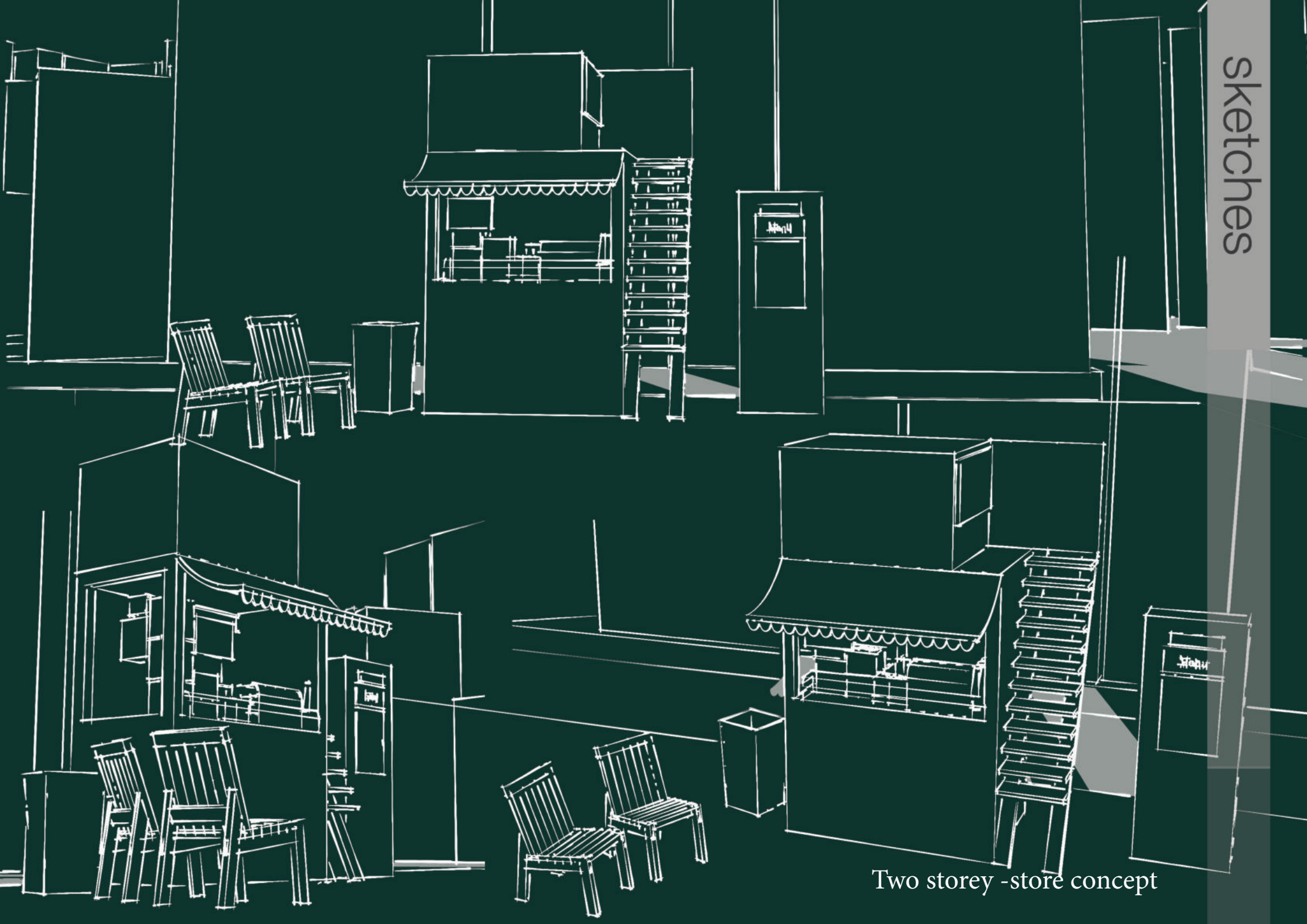
Abstract shapes concept

THE CONCEPT inspired from abstract geometric shapes. Simple method of construction and details are one specialty of this forms. The two ellipses on the side of kiosk will be used as a storage space and can be inter changed with other geometric shapes.

Material: FRP with stainless steel will be good with these forms.

CONS

Dosent have a strong fun element or noticing features.

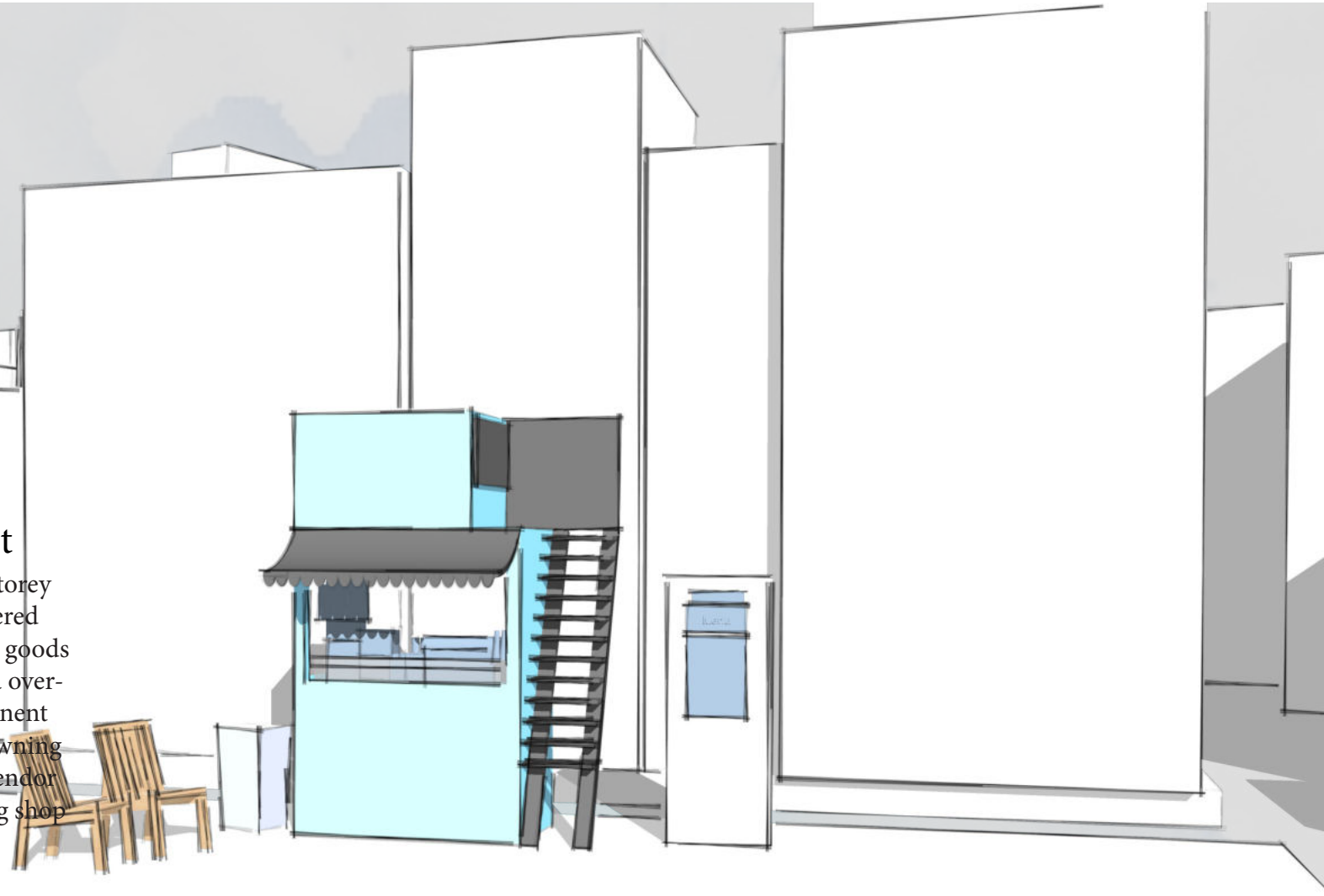


Two storey -store concept

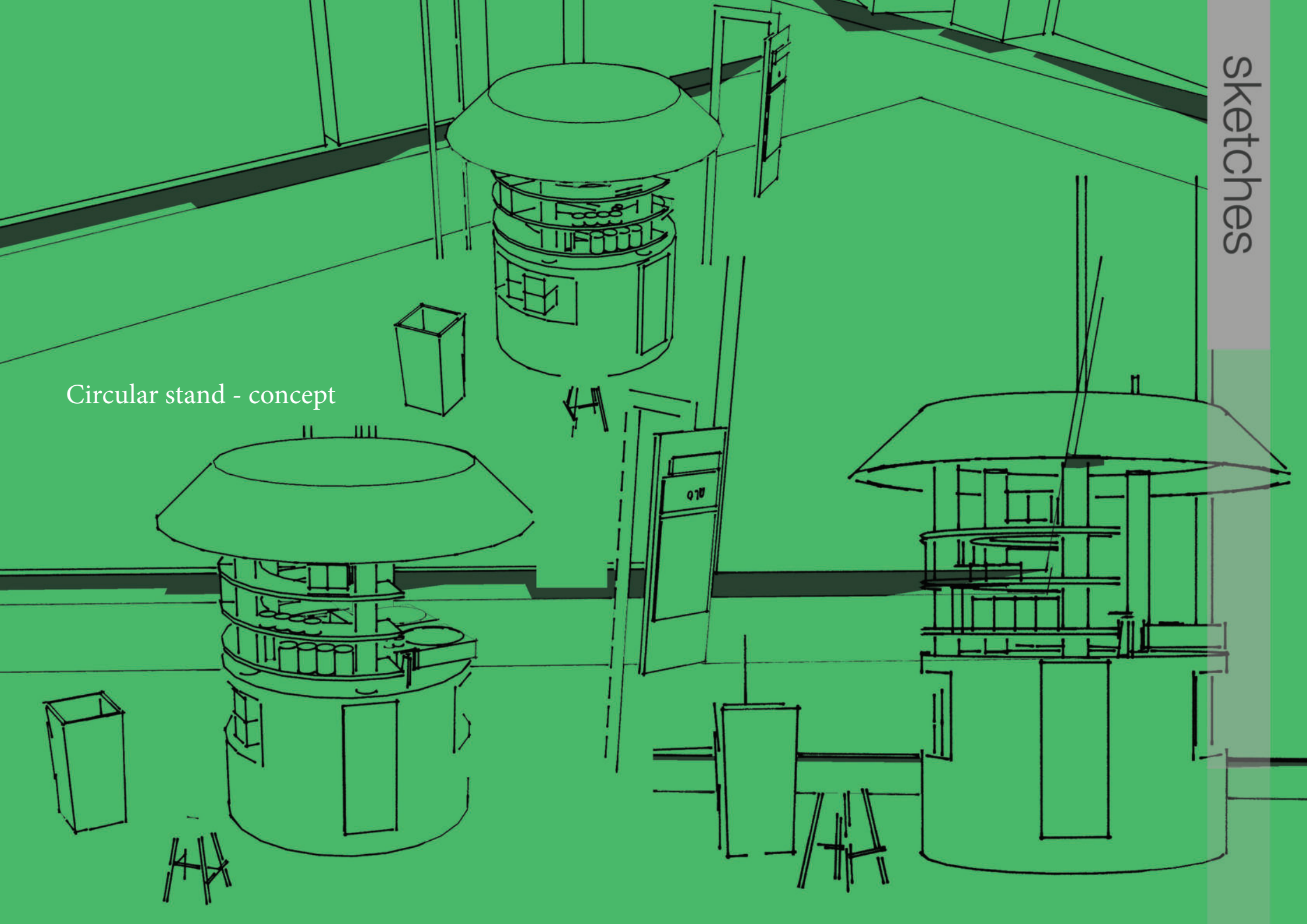
Two storey -store concept

THE CONCEPT inspired from two storey structures. The above space is considered for storage purpose. Small furnitures, goods for shop, or even this can be used as a over-head water tank. This will be a permanent strcuture. There will be retractable awning for shades. Biggest advanatge is the vendor dosent have to run for supplies during shop hours.

Since it is immovable , the space will be an issue. vendor would need a permanent space to run the business. It might become costly.



Circular stand - concept

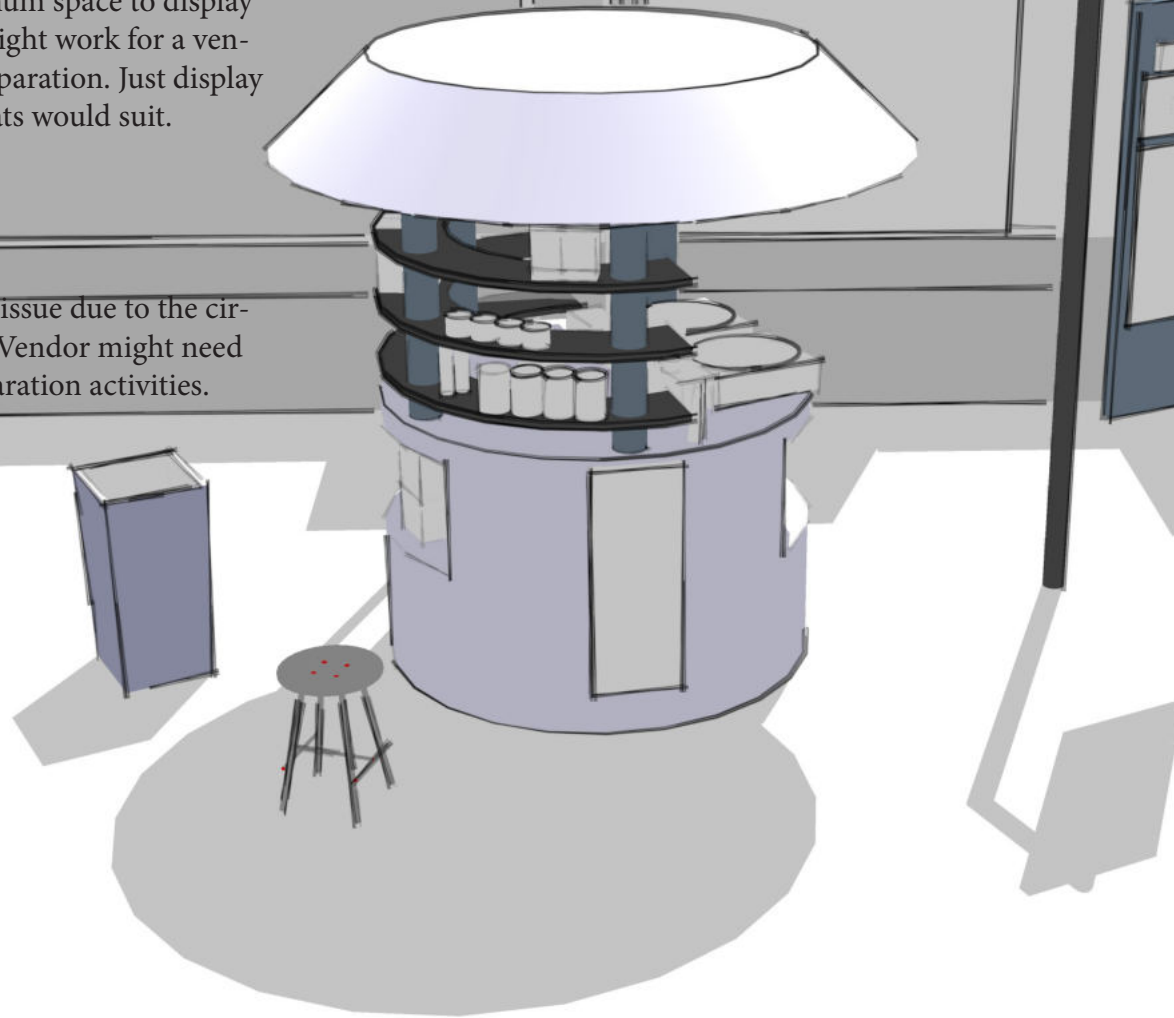


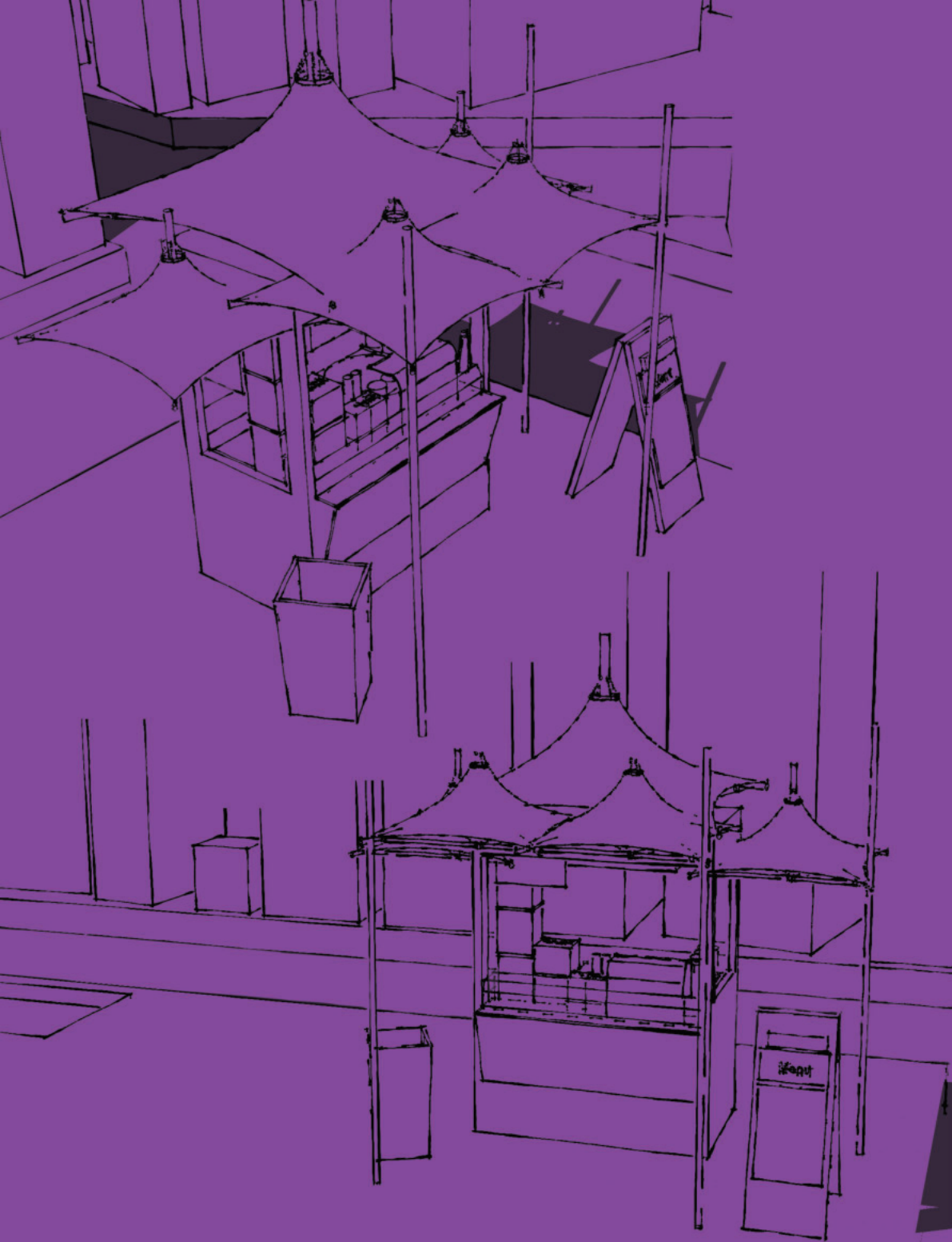
Circular stand - concept

THE CONCEPT inspired from circular structures. Since the structure is round everyone could stand around the kiosk and have food. food can be displayed and can be seen from 360. Maximum space to display food is one advantage. Might work for a vendor who doesn't need preparation. Just display and sell it. Snacks or chaats would suit.

CONS

wheels might become an issue due to the circular shape of the kiosk. Vendor might need to move around for preparation activities.





Tensile structures concept



Tensile structures concept

THE CONCEPT

The roofing of the cart will be made with tensile structures. High strength fabrics with metal frames.

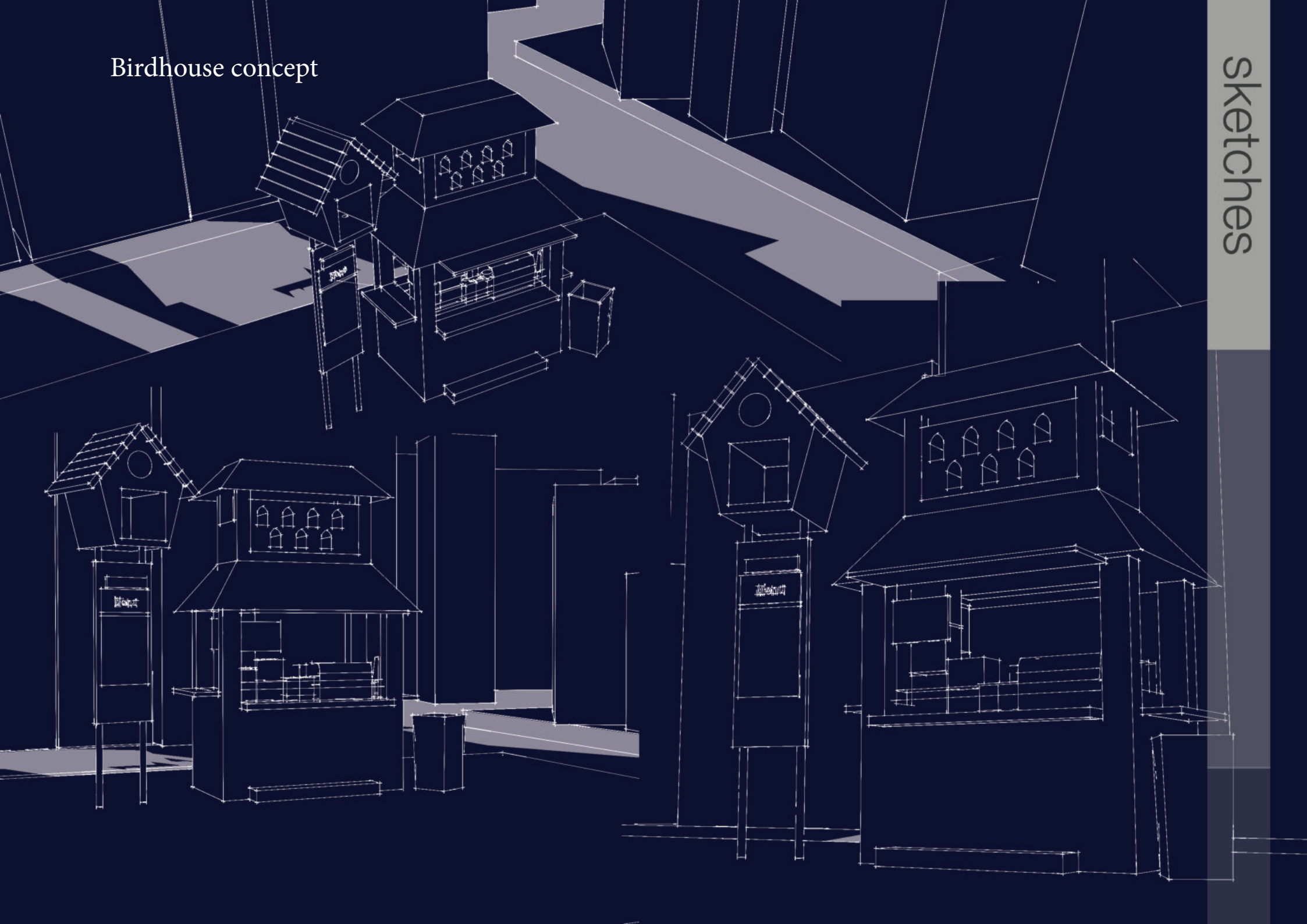
Light weight structures. Fun-element and noticing form. Good aesthetics.

CONS

cost might increase.
wind load might create a problem.
Need permanent space.

Birdhouse concept

sketches



Birdhouse concept

THE CONCEPT inspired from the my experience of birdhouses -aviary. The kiosk will be having bird-Houses on top. The kiosk vendor can give leftovers to the birds.

This can give home & food to many birds whose homes are gone by deforestation and cutting down of trees.

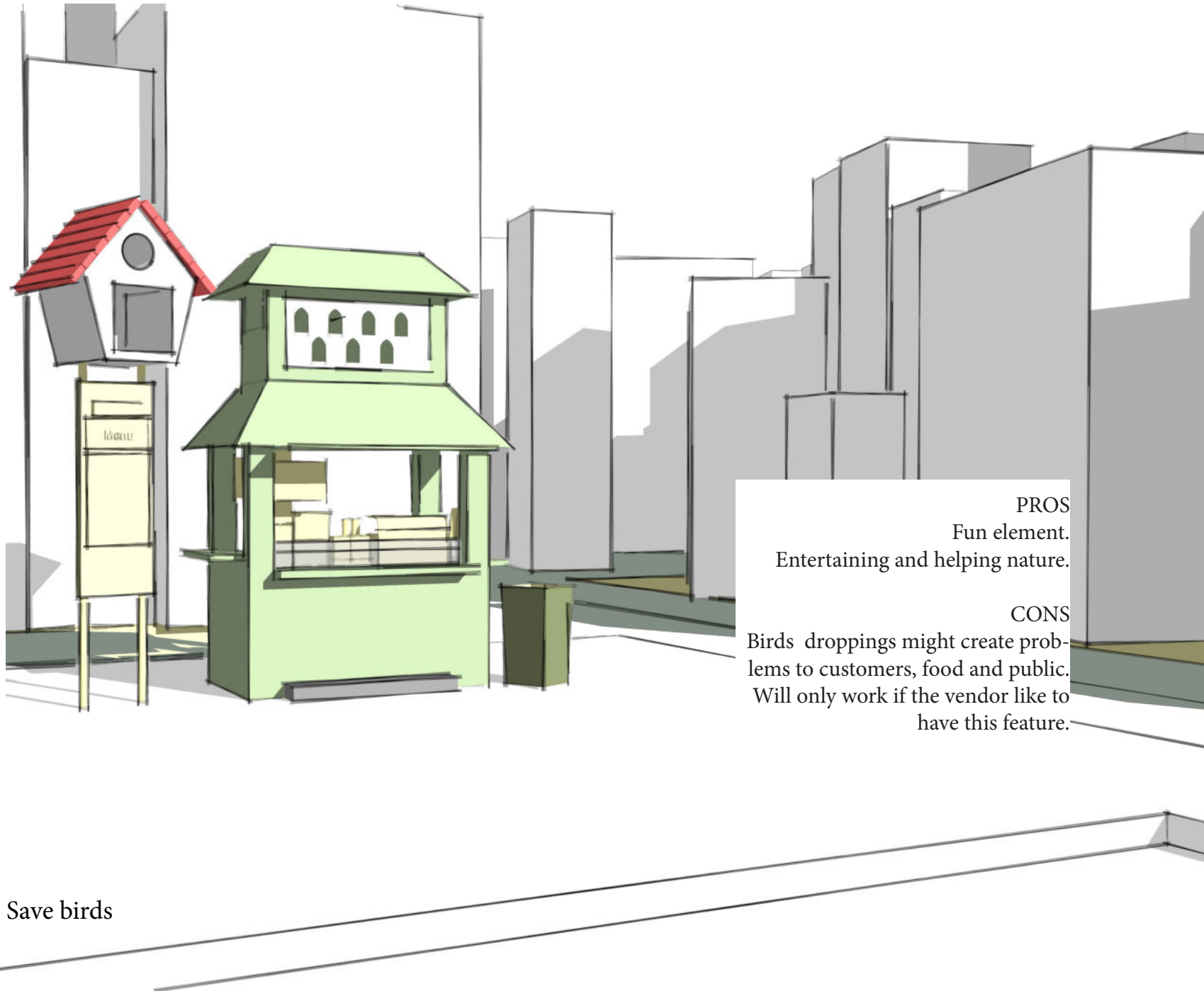
Natrue lovers and bird lovers will love, enjoy and ready to come to this spot. Fun-for kids and people who like birds.

Make awarness among kids and people.

En example to show co-existence of human and nature.

These dosent have to be only in cities, these can aslo go where there are good amount of space in villages.

Watch birds, Feed birds, Save birds

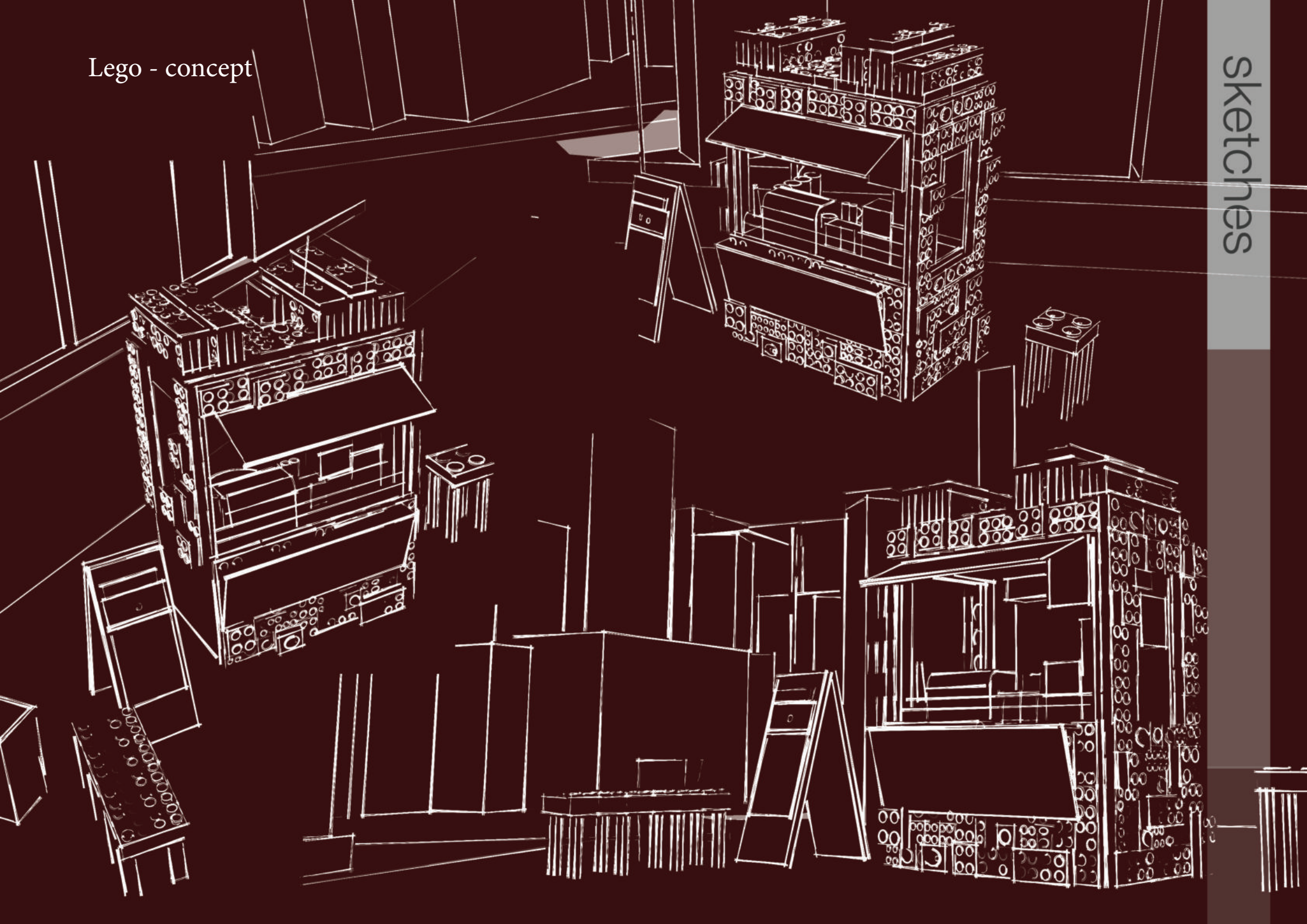


PROS
Fun element.
Entertaining and helping nature.

CONS
Birds droppings might create problems to customers, food and public.
Will only work if the vendor like to have this feature.

Lego - concept

sketches



Lego - concept

THE CONCEPT inspired from LEGO. A theme based exploration.

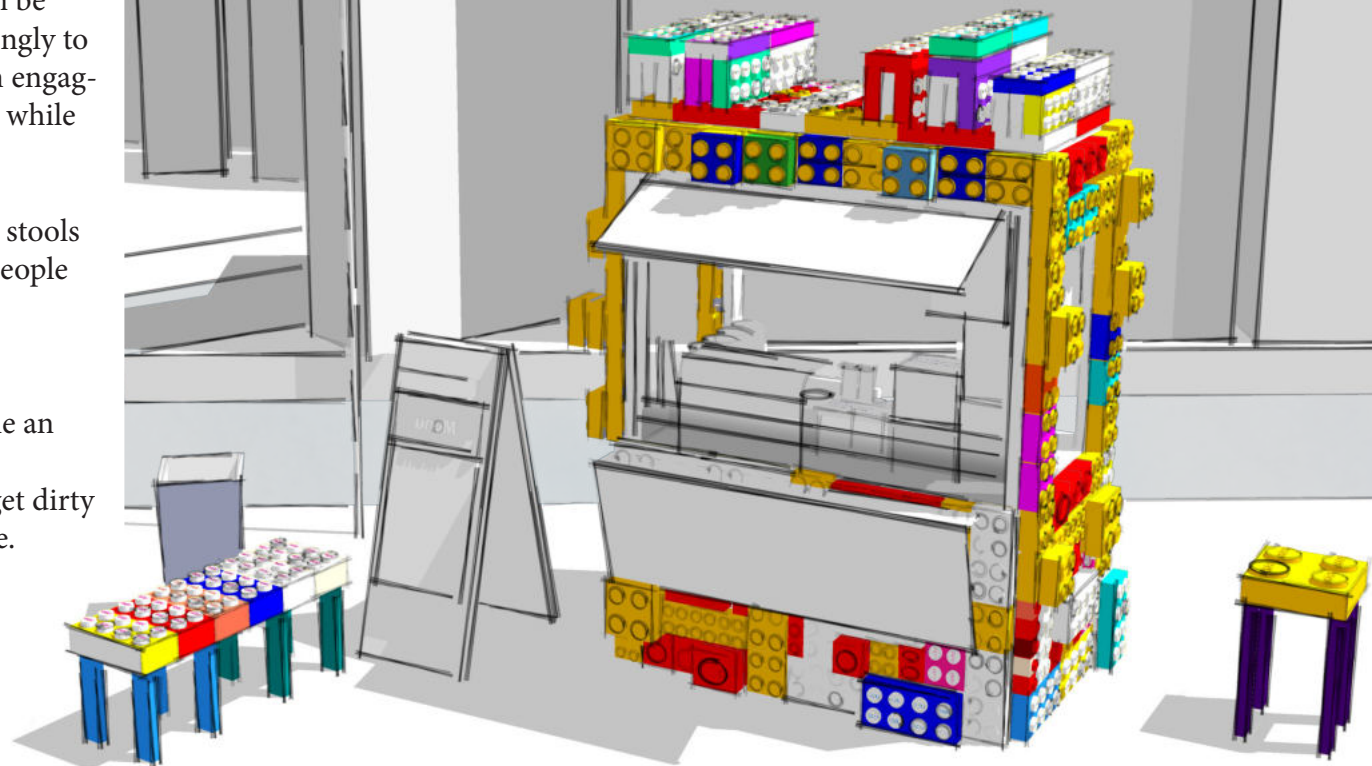
The outside layer will be actually fitted with big lego blocks. which can be removed and arranged accordingly to the users needs. This will be an engaging activity for kids and young while waiting for the food.

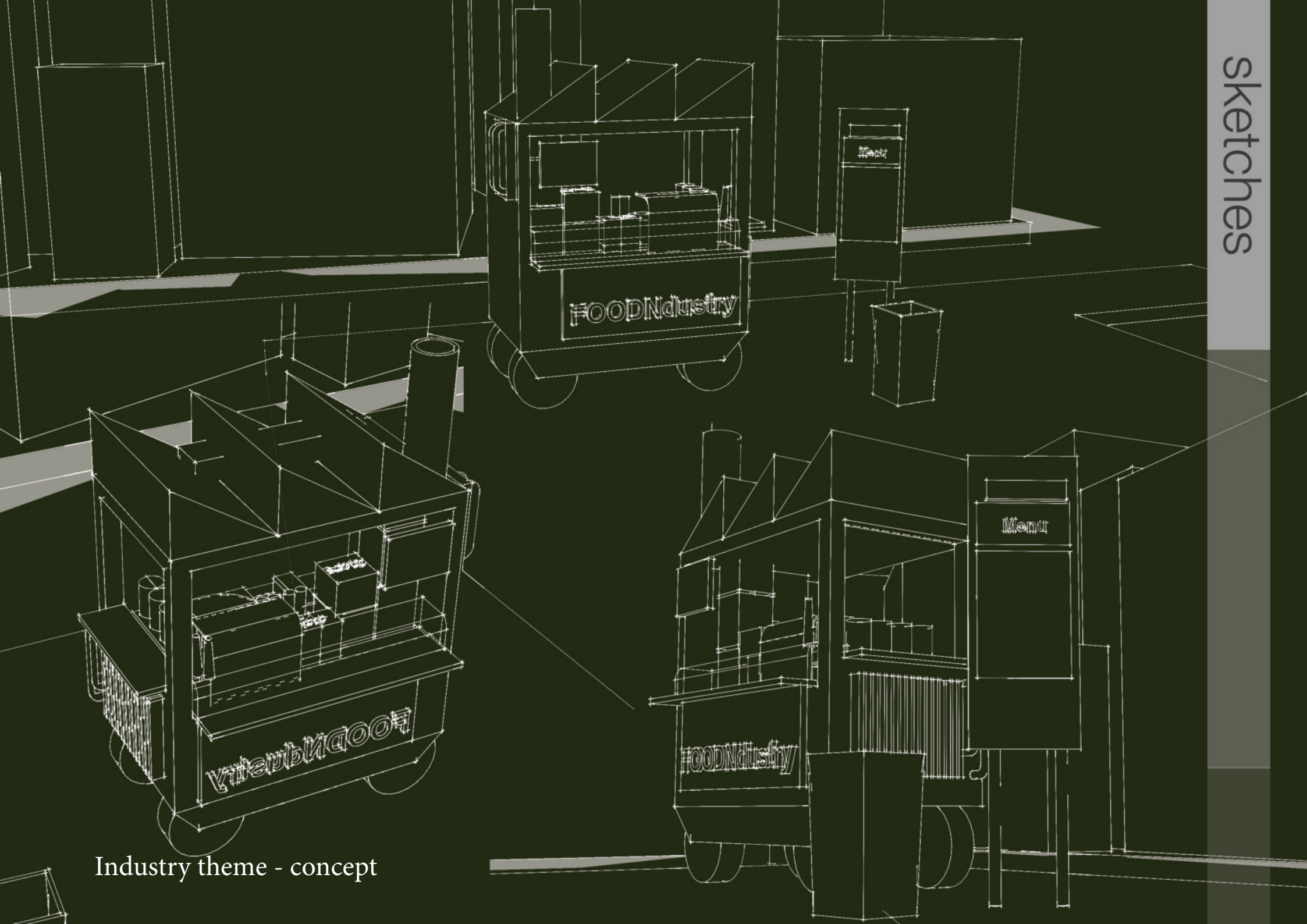
LEGO theme based chairs and stools will also be part of the kiosk. people can arrange them also.

CONS

loosing of blocks might become an issue.

In indian conditions it might get dirty quickly. so care should be there.

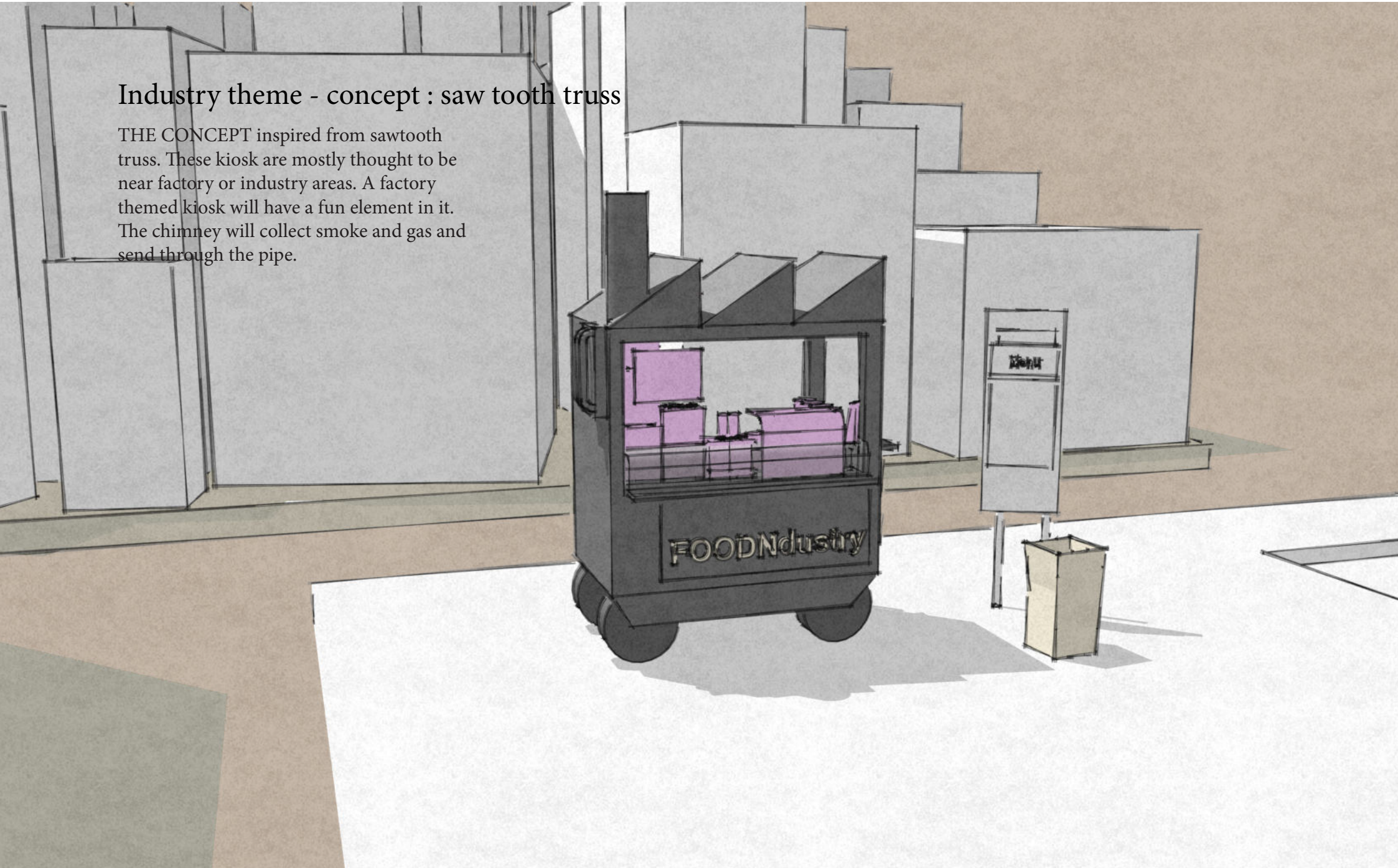




Industry theme - concept

Industry theme - concept : saw tooth truss

THE CONCEPT inspired from sawtooth truss. These kiosk are mostly thought to be near factory or industry areas. A factory themed kiosk will have a fun element in it. The chimney will collect smoke and gas and send through the pipe.



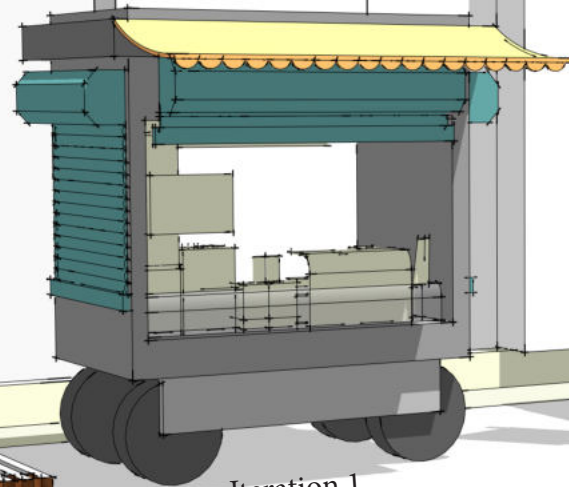


Traditional shop - concept

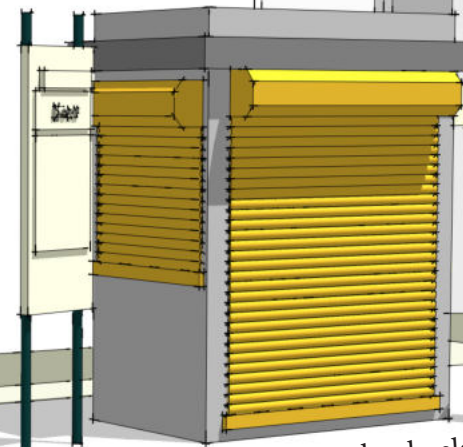
SHOPS ON WHEELS

THE CONCEPT inspired from local shops with collapsible shutters. SHOPS on wheels would be a good name for these kind of carts.

Vendor can have a feeling that it is a shop not just a street food cart. Protection would be high in this concept since the collapsible shutters are very good .



Iteration 1

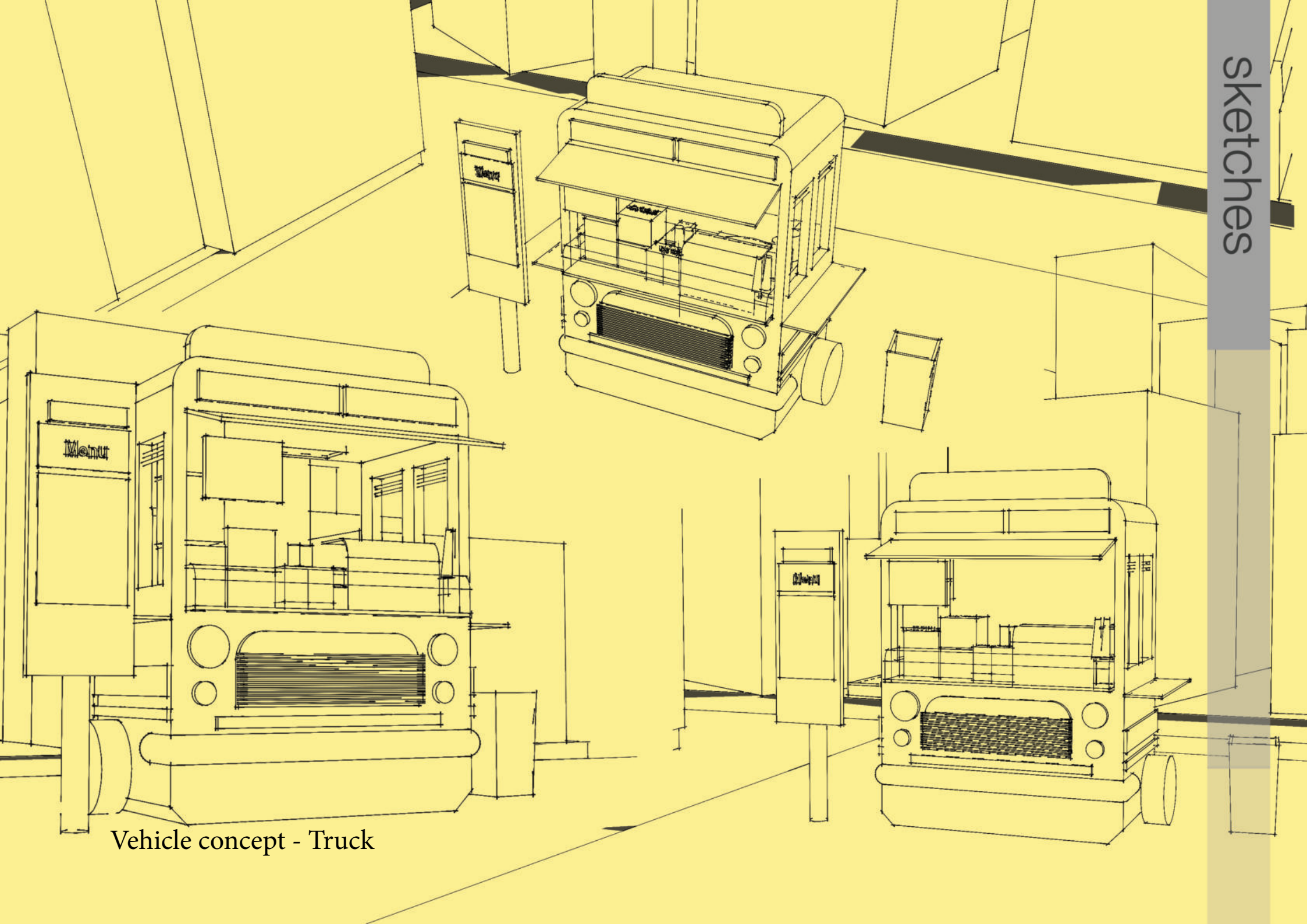


Iteration 2 with wheels

CONS

Weight might become more due to heavy components.

There is no fun element. NO features to attract the customers.



Vehicle concept - Truck

Vehicle concept - Truck

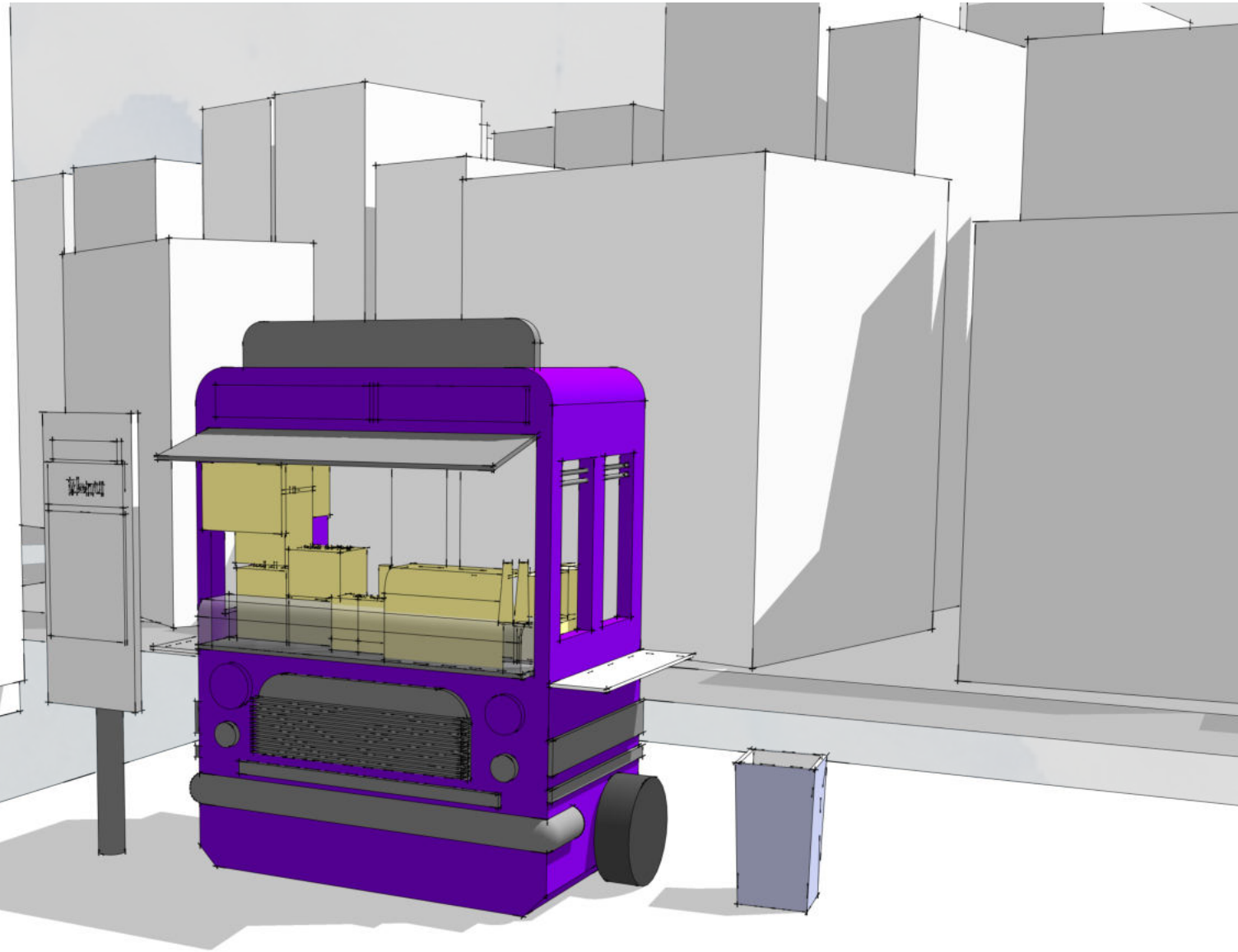
THE CONCEPT inspired from the driver cabin of trucks. These forms can evoke a fun element in the kiosk design. The idea is the vehicle manufacturers can sponsor a kiosk or particular kind of kiosks. These can act as a advertisement for the companies ad will be helpful for vendors.

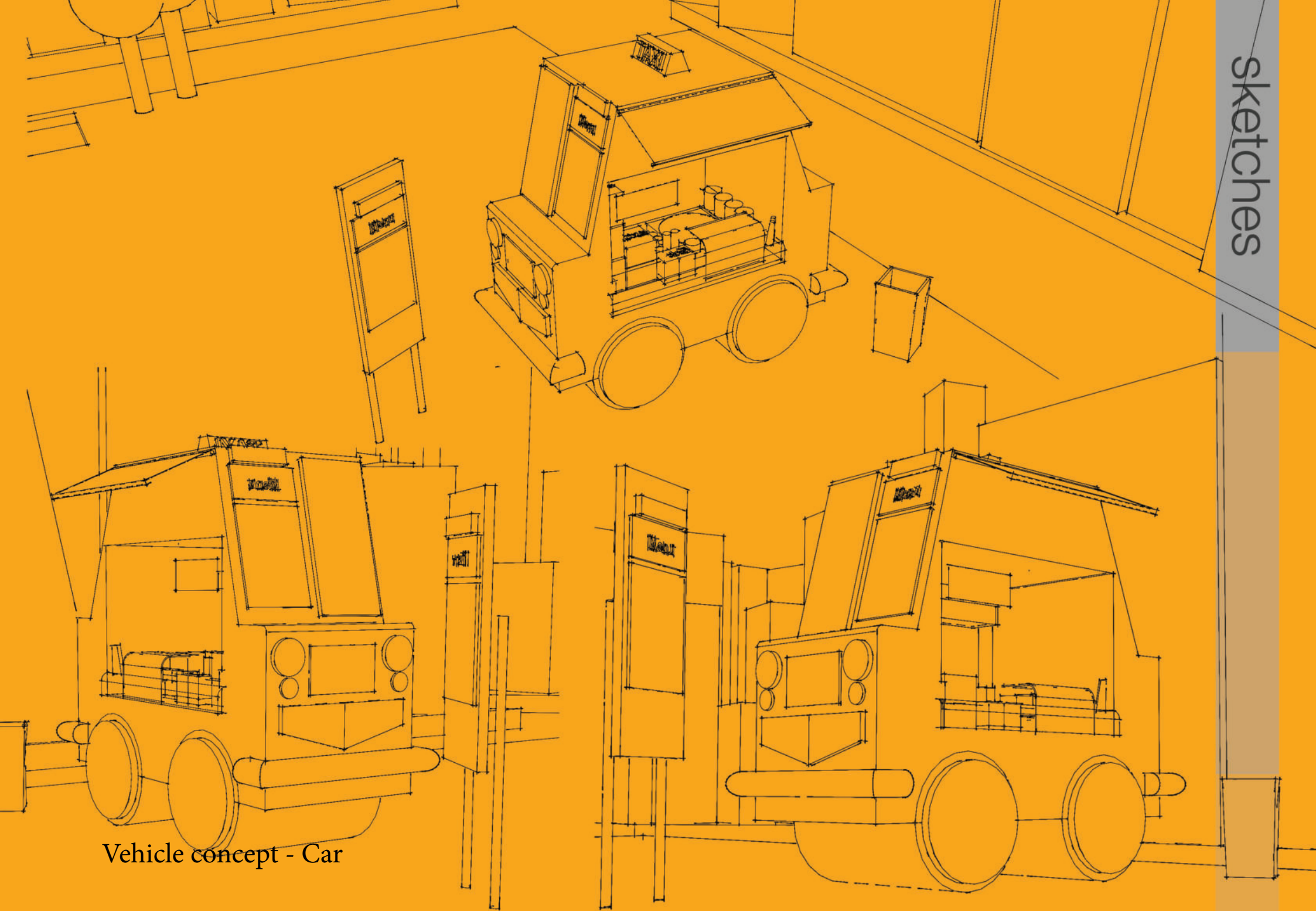
It will be actually made like a driving cabinet. The special appearance of vehicle forms can get noticed easily in the streets. The headlights will be fitted with low watt LEDs just to simulate light.

Mobility will be good for this kind of kiosks and wheels are just matching.

Cost might increase since there are more complex parts.

Also it might become heavy. Association with food is less





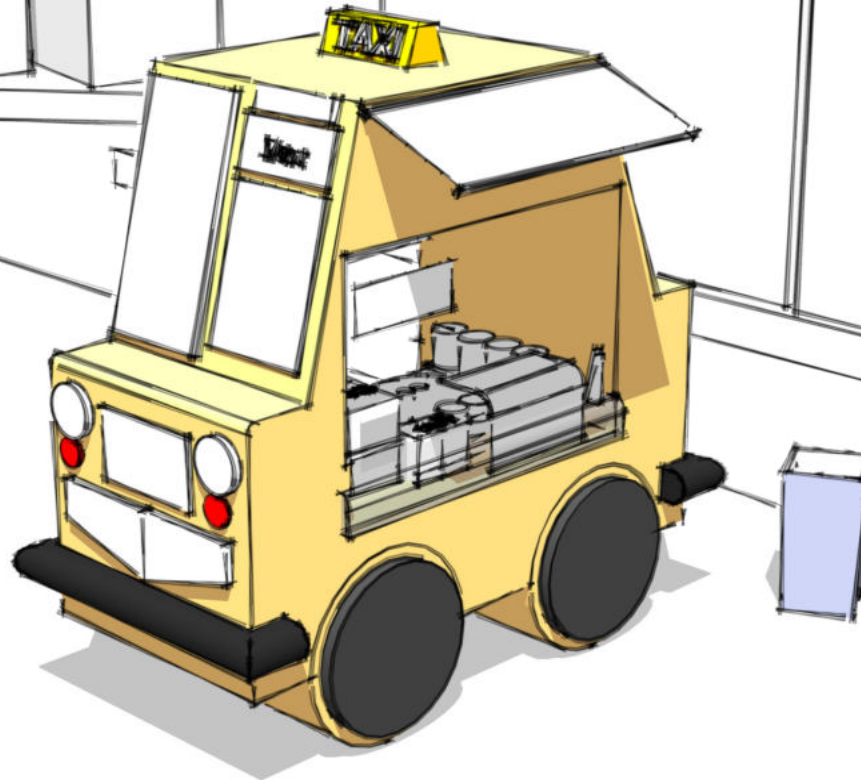
Vehicle concept - Car

Vehicle concept - Car

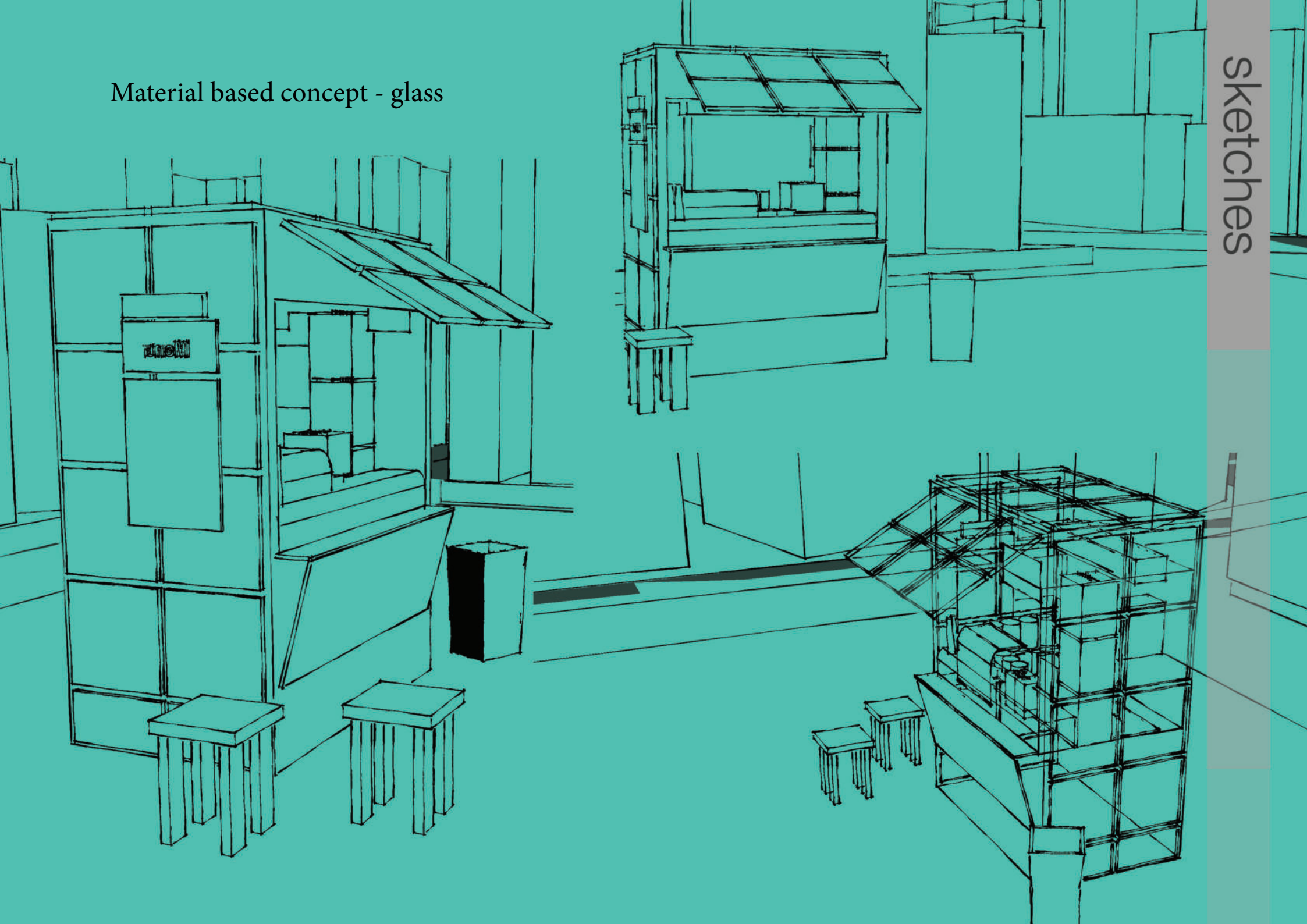
THE CONCEPT inspired from the cars. These forms can evoke a fun element in the kiosk design. The idea is the vehicle manufacturers can sponsor a kiosk or particular kind of kiosks. These can act as a advertisement for the companies ad will be helpful for vendors.

It will be actually made like a driving cabinet. The special appearance of vehicle forms can get noticed easily in the streets. The headlights will be fitted with low watt LEDs just to simulate light. Mobility will be good for this kind of kiosks and wheels are just matching.

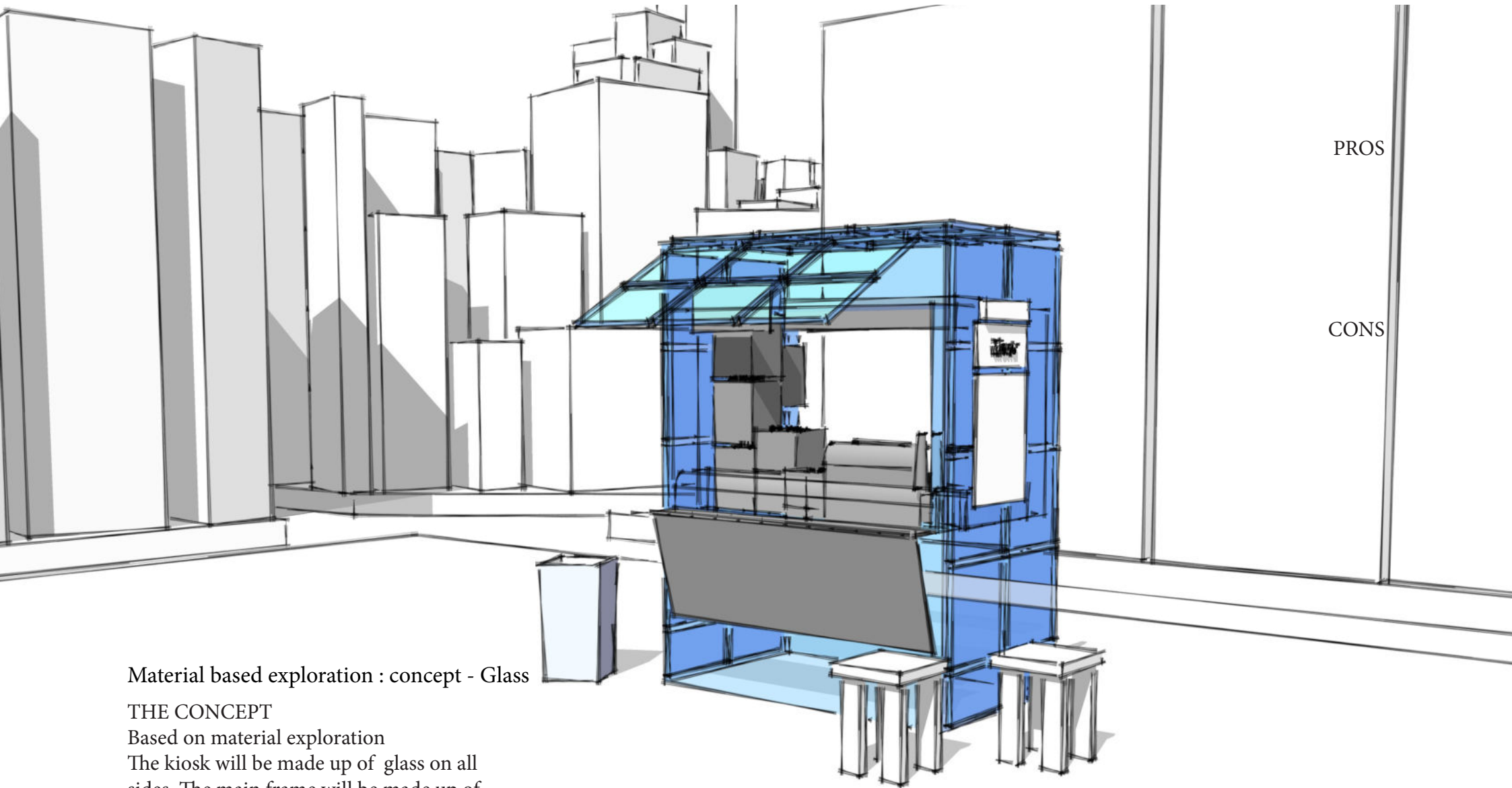
Cost might increase since there are more complex parts.
Also it might become heavy.



Material based concept - glass



sketches



PROS

CONS

Material based exploration : concept - Glass

THE CONCEPT

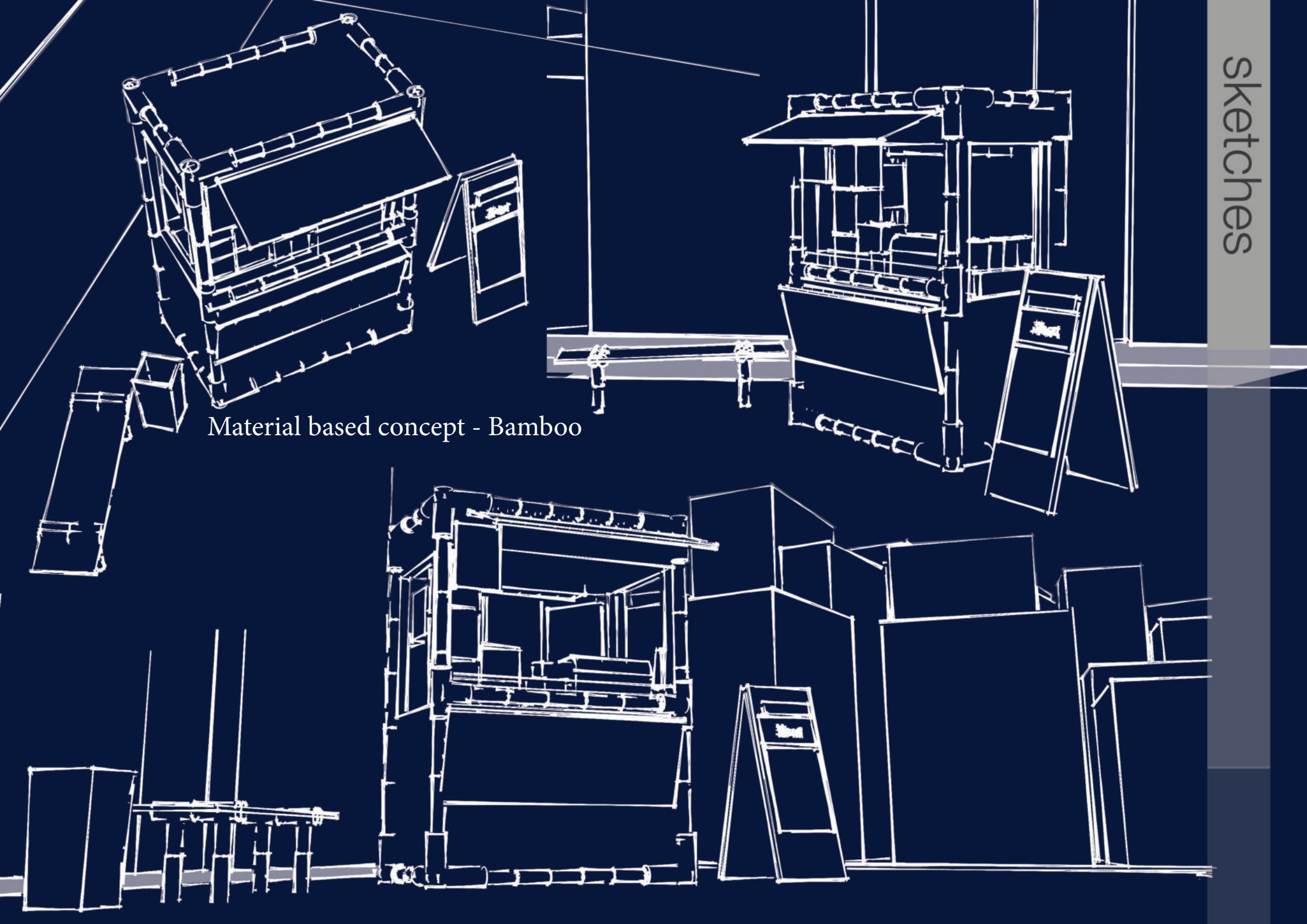
Based on material exploration

The kiosk will be made up of glass on all sides. The main frame will be made up of metal.

Everything will be transparent. The customers can view the process of cooking.

Cost and construction is one major issue.
Also dust in Indian scenario.

Material based concept - Bamboo

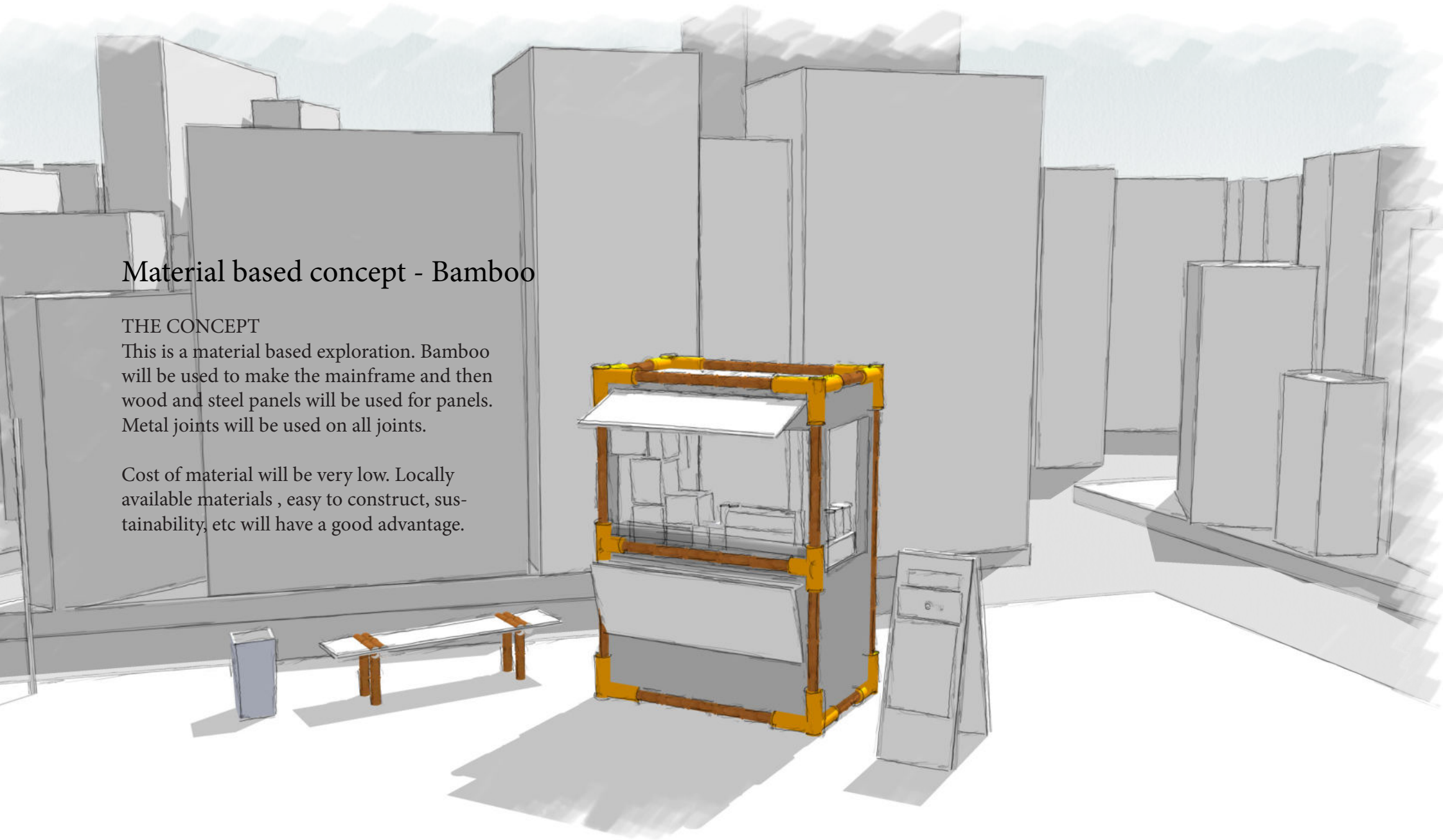


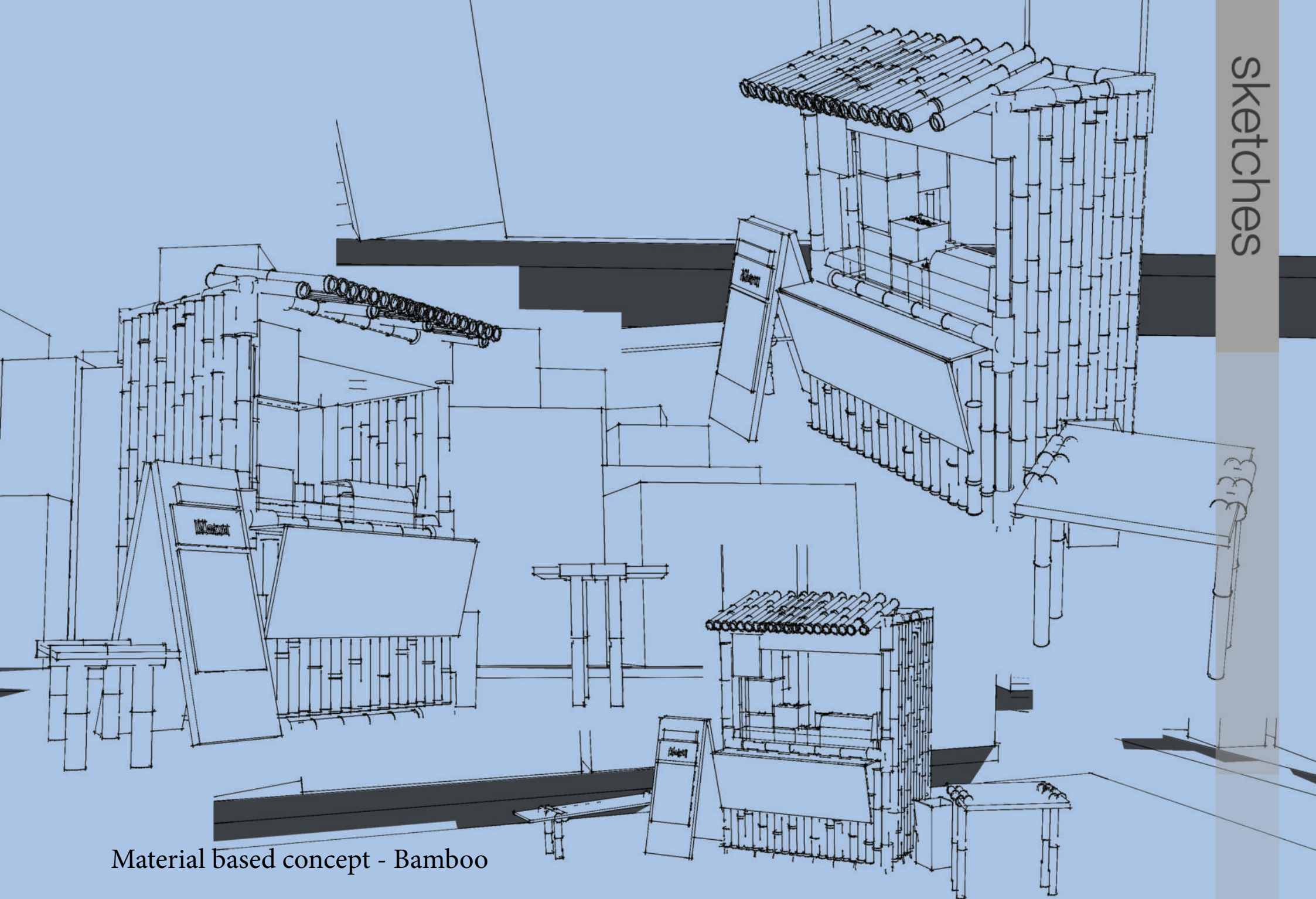
Material based concept - Bamboo

THE CONCEPT

This is a material based exploration. Bamboo will be used to make the mainframe and then wood and steel panels will be used for panels. Metal joints will be used on all joints.

Cost of material will be very low. Locally available materials, easy to construct, sustainability, etc will have a good advantage.





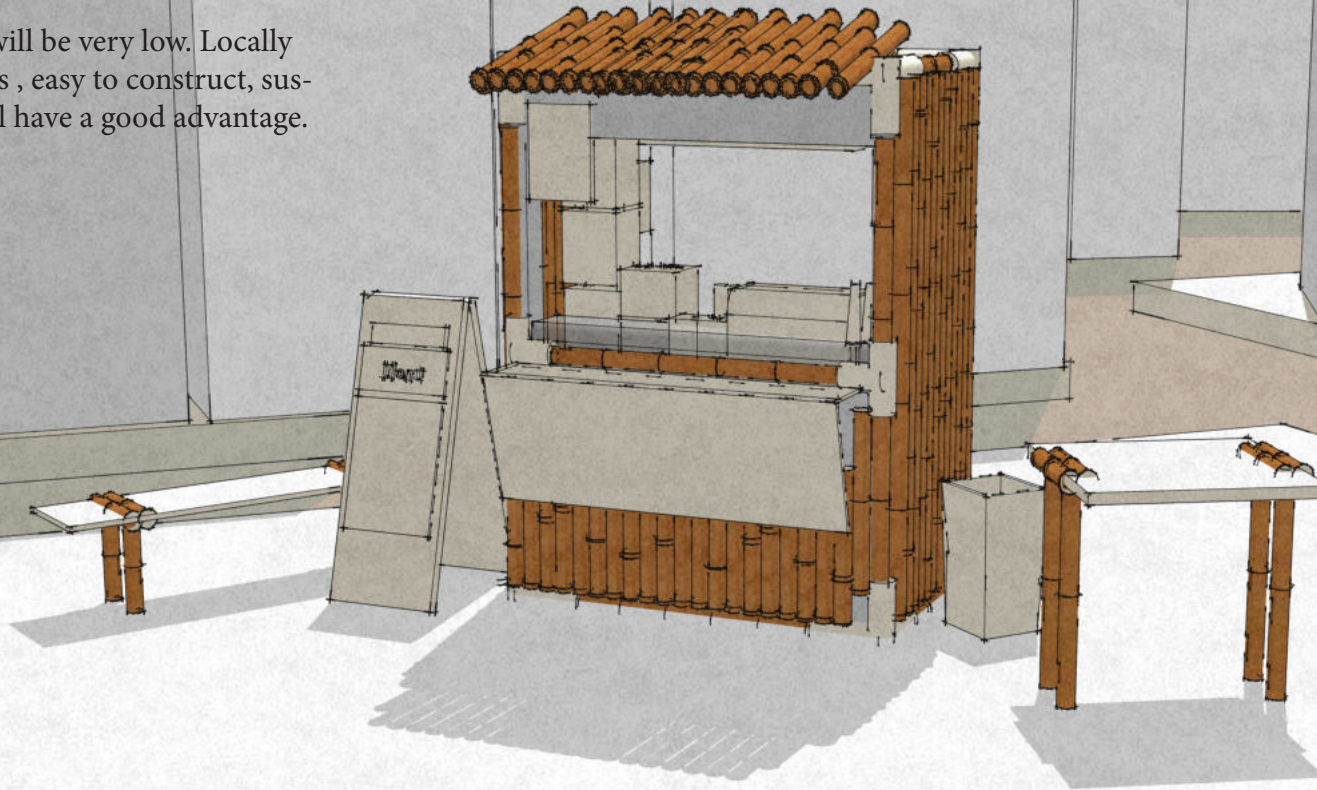
Material based concept - Bamboo

Material based concept - Bamboo

THE CONCEPT

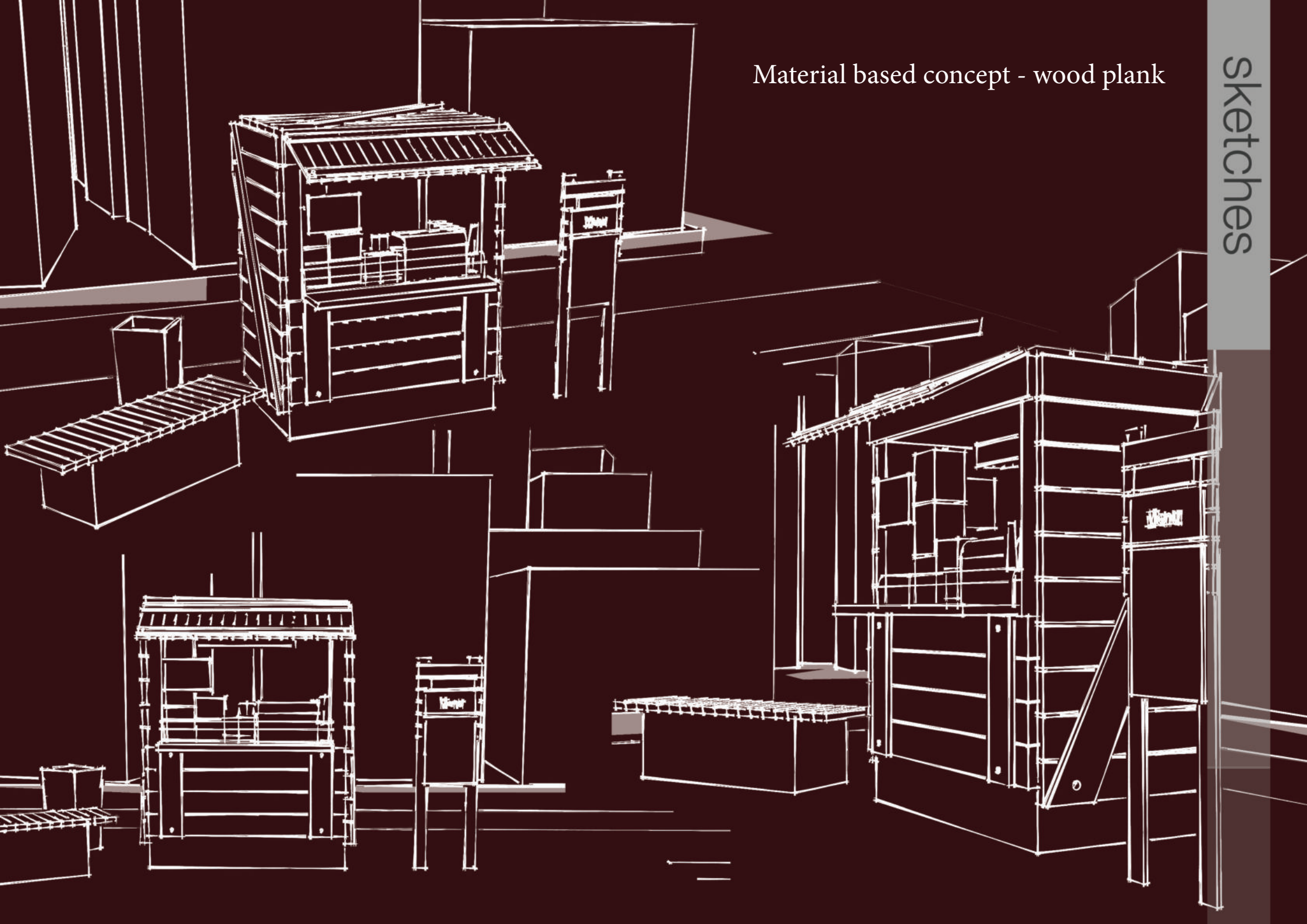
This is a material based exploration. Bamboo will be used to make the whole kiosk. Metal joints will be used on all joints.

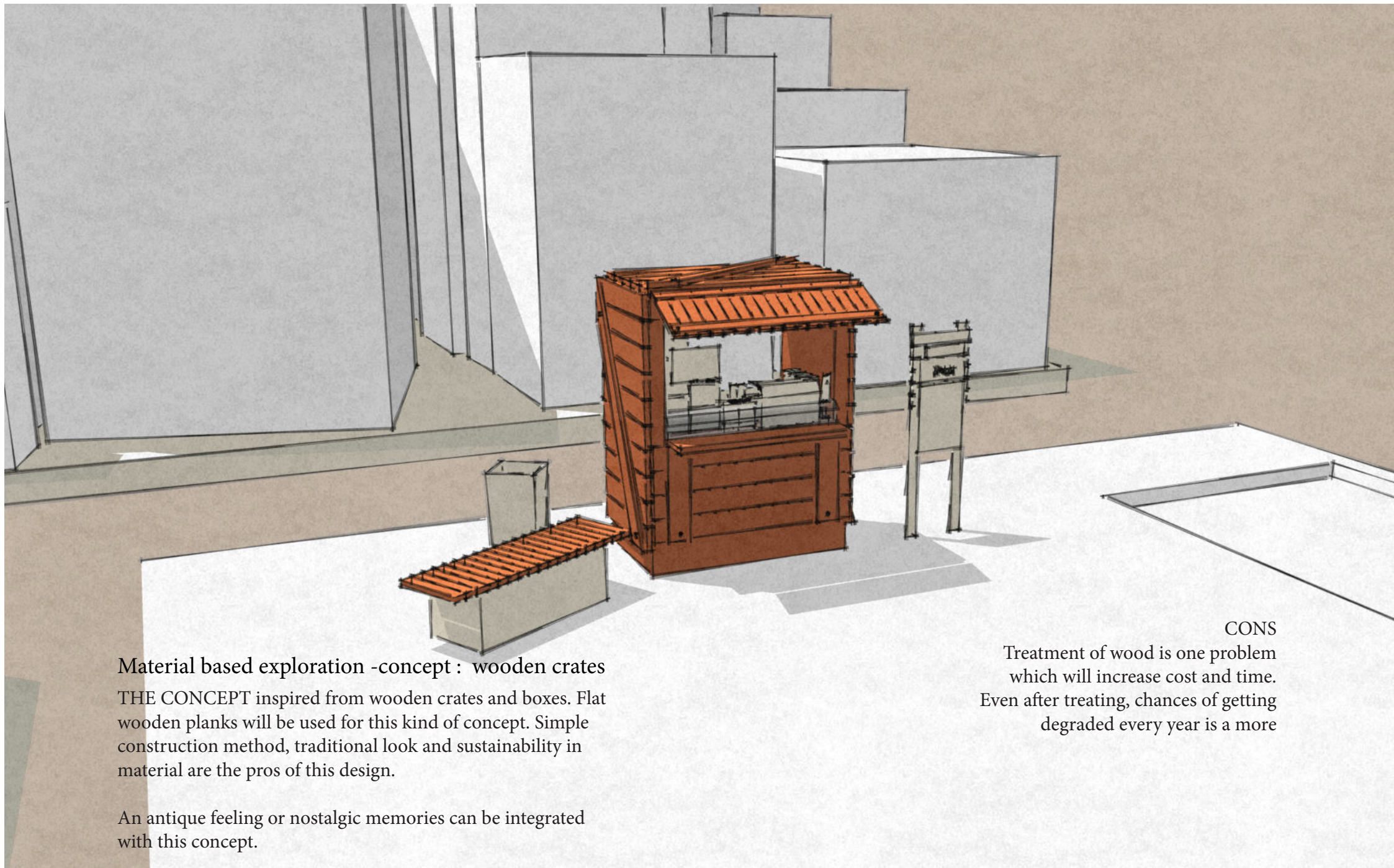
Cost of material will be very low. Locally available materials, easy to construct, sustainability, etc will have a good advantage.



Material based concept - wood plank

sketches





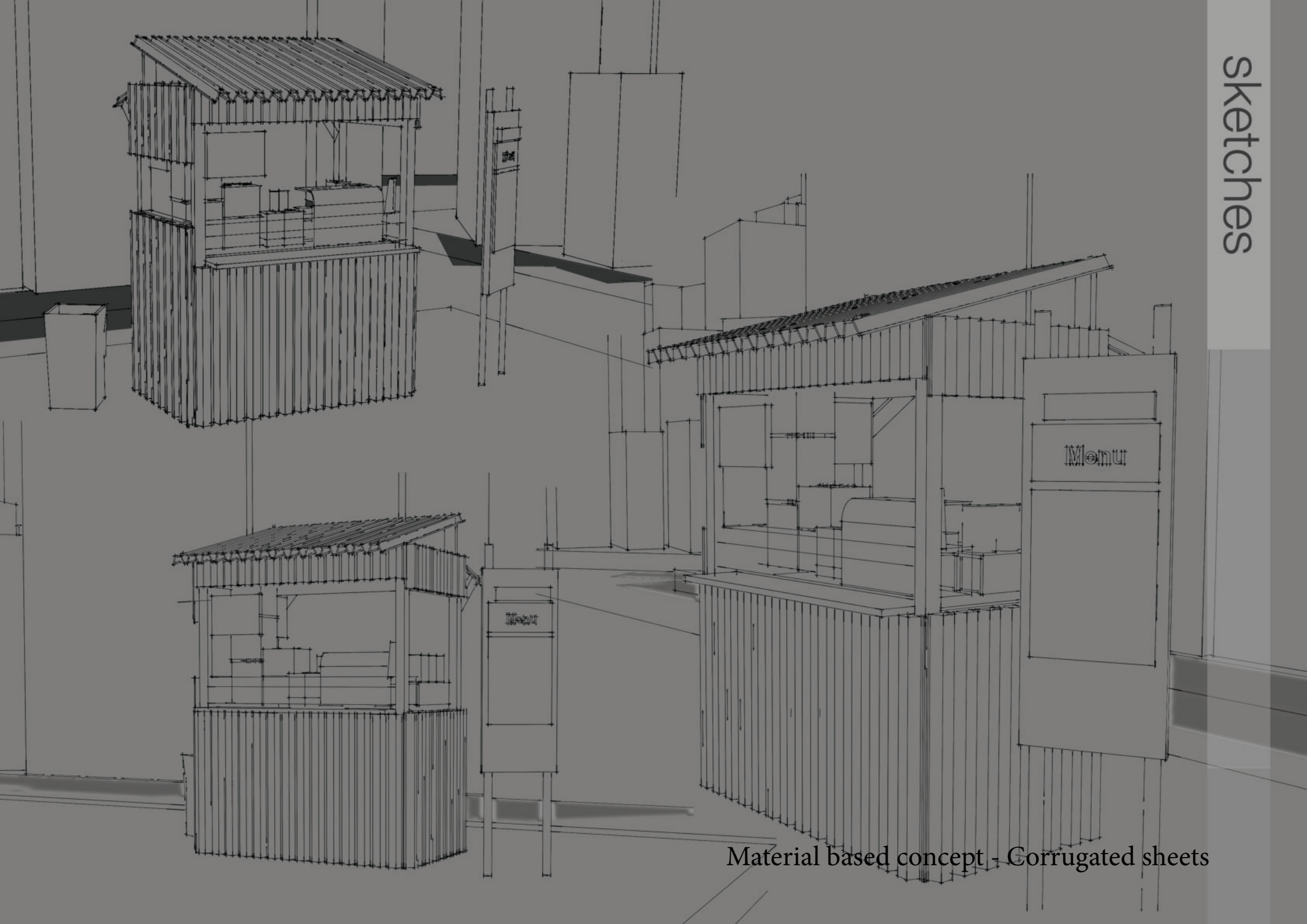
Material based exploration -concept : wooden crates

THE CONCEPT inspired from wooden crates and boxes. Flat wooden planks will be used for this kind of concept. Simple construction method, traditional look and sustainability in material are the pros of this design.

An antique feeling or nostalgic memories can be integrated with this concept.

CONS

Treatment of wood is one problem which will increase cost and time. Even after treating, chances of getting degraded every year is a more

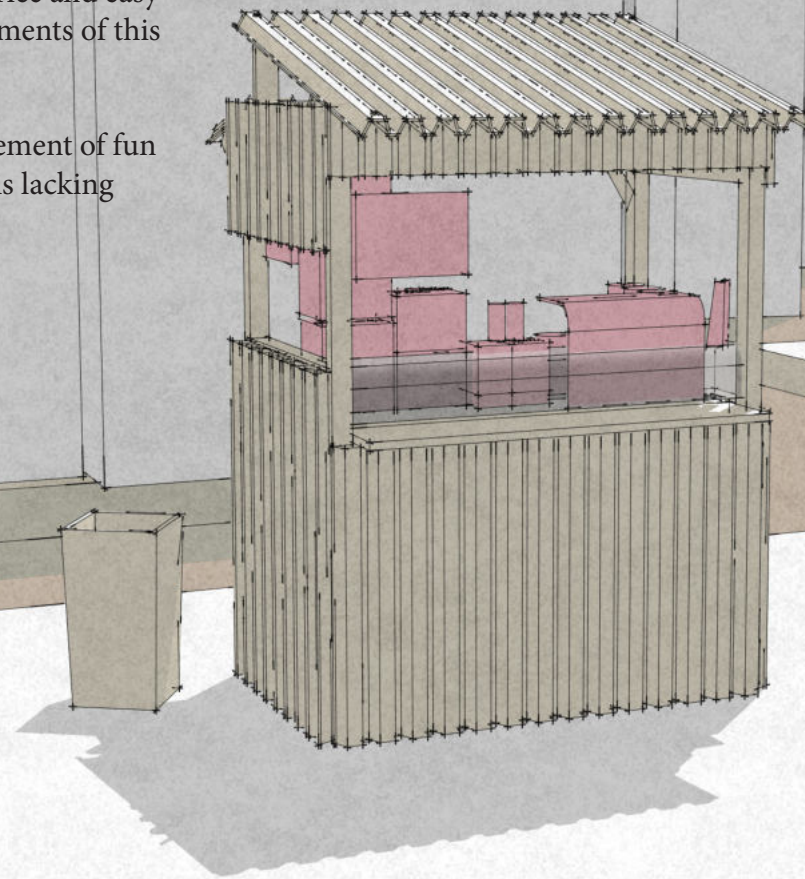


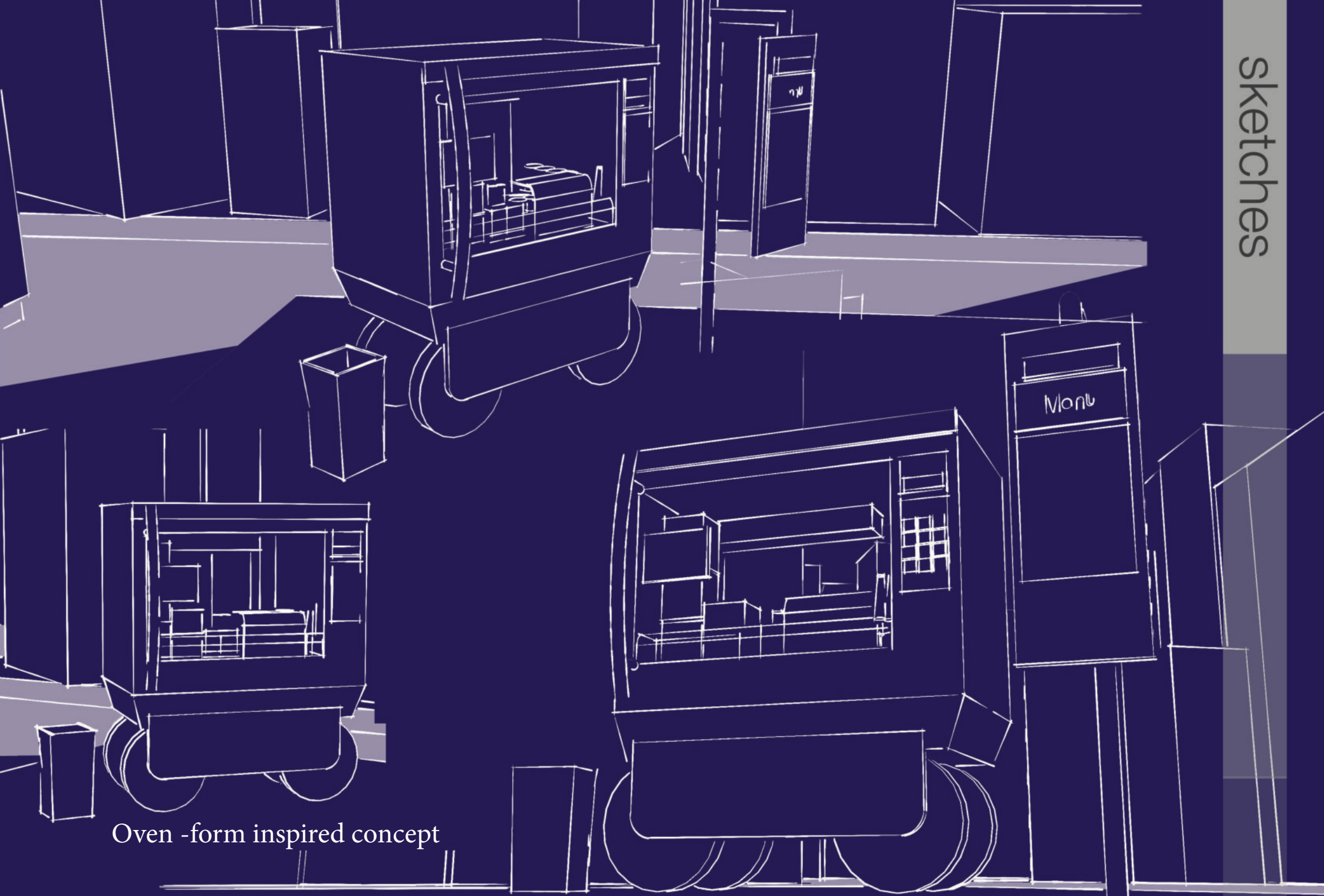
Material based concept - Corrugated sheets

Material based exploration -concept :Corrugated sheets

THE CONCEPT is a material based exploration. Inspired from corrugated sheets. Readily availability of sheets , fast and simple construction , affordability in price and easy maintenance are biggest achievements of this concept.

But this lacks innovativeness. Element of fun and feature to attract the crowd is lacking here.





Oven -form inspired concept

Street-OVENS

Oven -form & function inspired concept

Materials

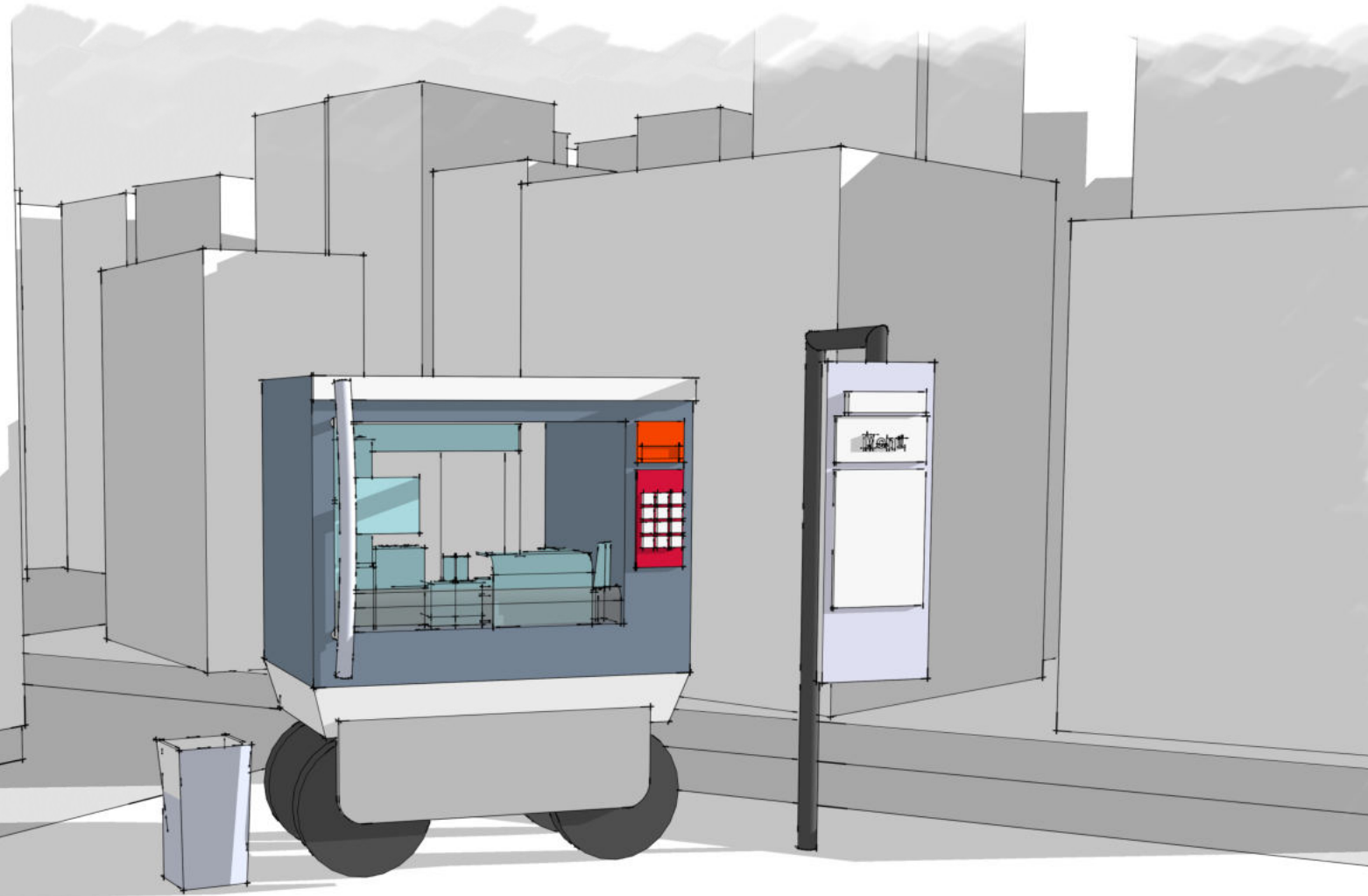
Industrial plastic & stainless steel will be used for this concept. The finish will be that of an Oven.

THE CONCEPT is such that these kiosks will have the visual language of an oven, Since oven is the appliance which will cook/heat food to make it appropriate for eating, it will help people to relate it to. This kiosk will be opened on two sides, on one side vendor will stand and other way the customers will stand. The cart will have a centralized heating system which will keep the food items hot, at all times. There will be a display panel like an oven which will display the temperature at all times.

This concept can be made with or without wheels.

CONS

Shading might obstruct the visual form. The design cant have opening on all 4 sides.



PROS

Visual Language of an oven will help to create a strong feeling among people that the food is fresh/hot.

Has a fun element in from.

The manufacturer can have different types of carts with different types of oven forms.



Food delivery Box concept

THE CONCEPT inspired from food delivery paper box. Associating the kiosk form with the food delivery package can be very catchy among customers mind. Packaged ready to eat food items will be good for this kind of kiosks.

Material :Paper composite with addition of plastic for water proofing will help to long last the material.

These kind of form wont go well with all kind of food items. Cant have counters on all 4 sides.



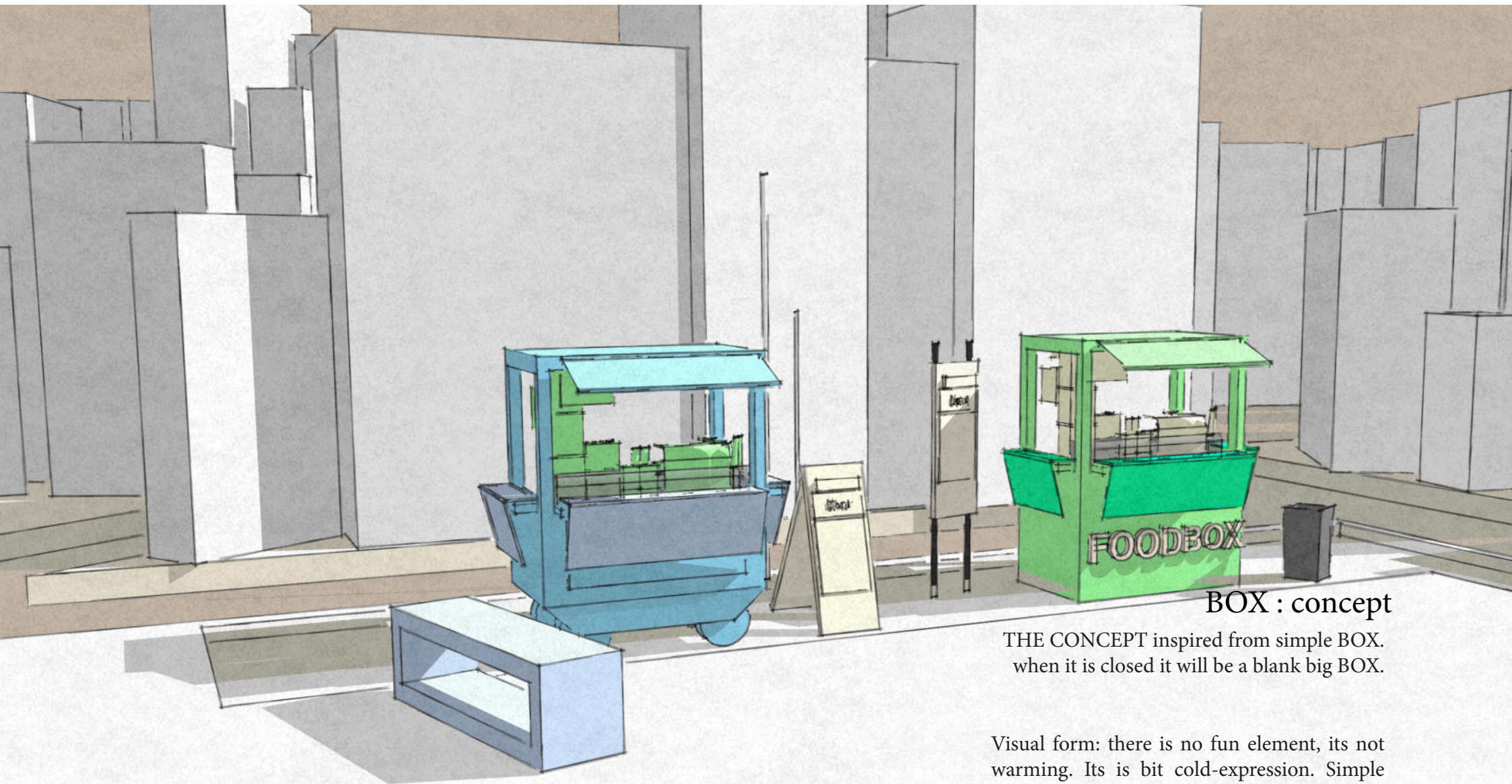
PROS

There is fun element in the form. Attractive colors will go well with these kind of kiosks.

food delivery Box concept

sketches





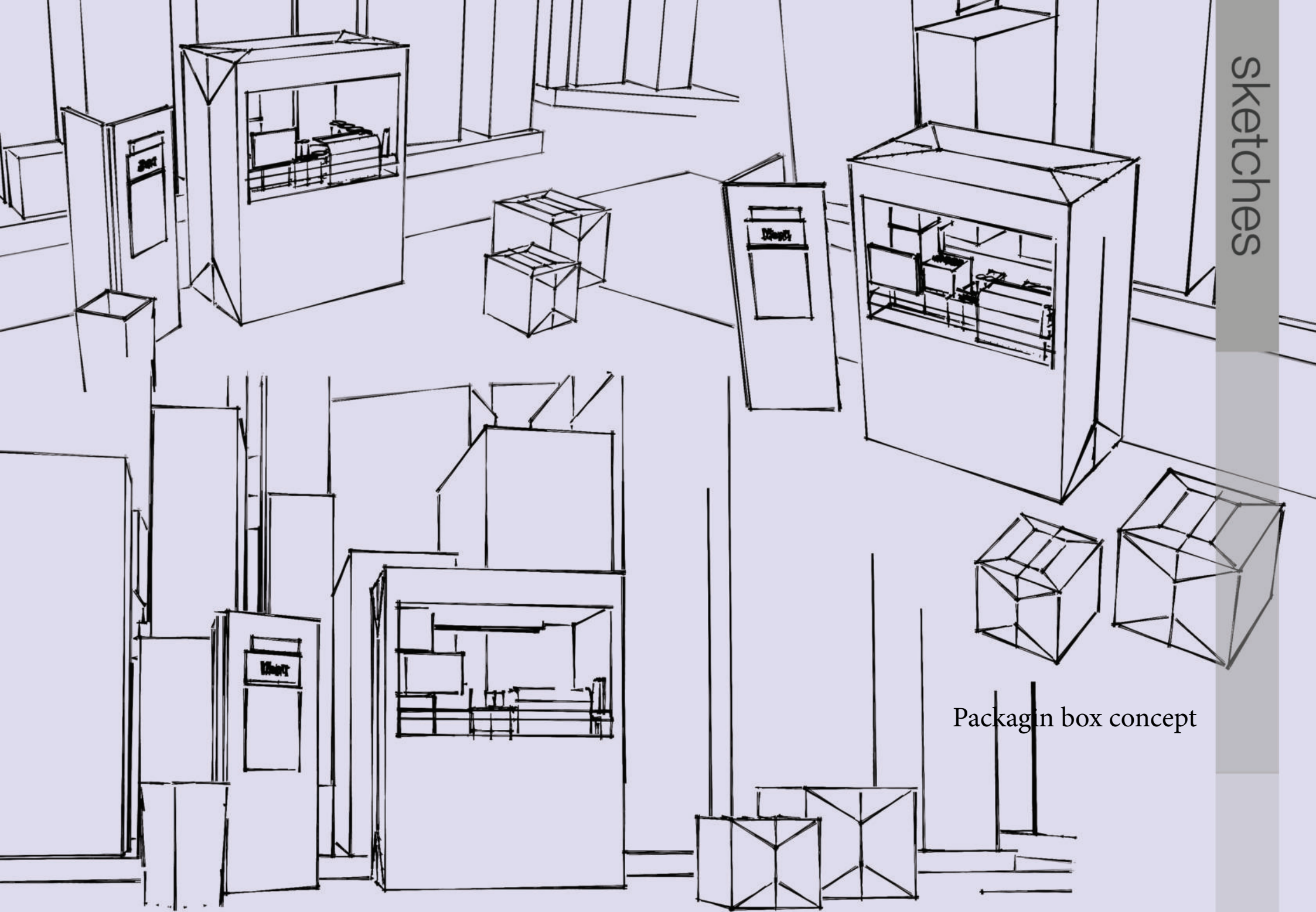
BOX : concept

THE CONCEPT inspired from simple BOX.
when it is closed it will be a blank big BOX.

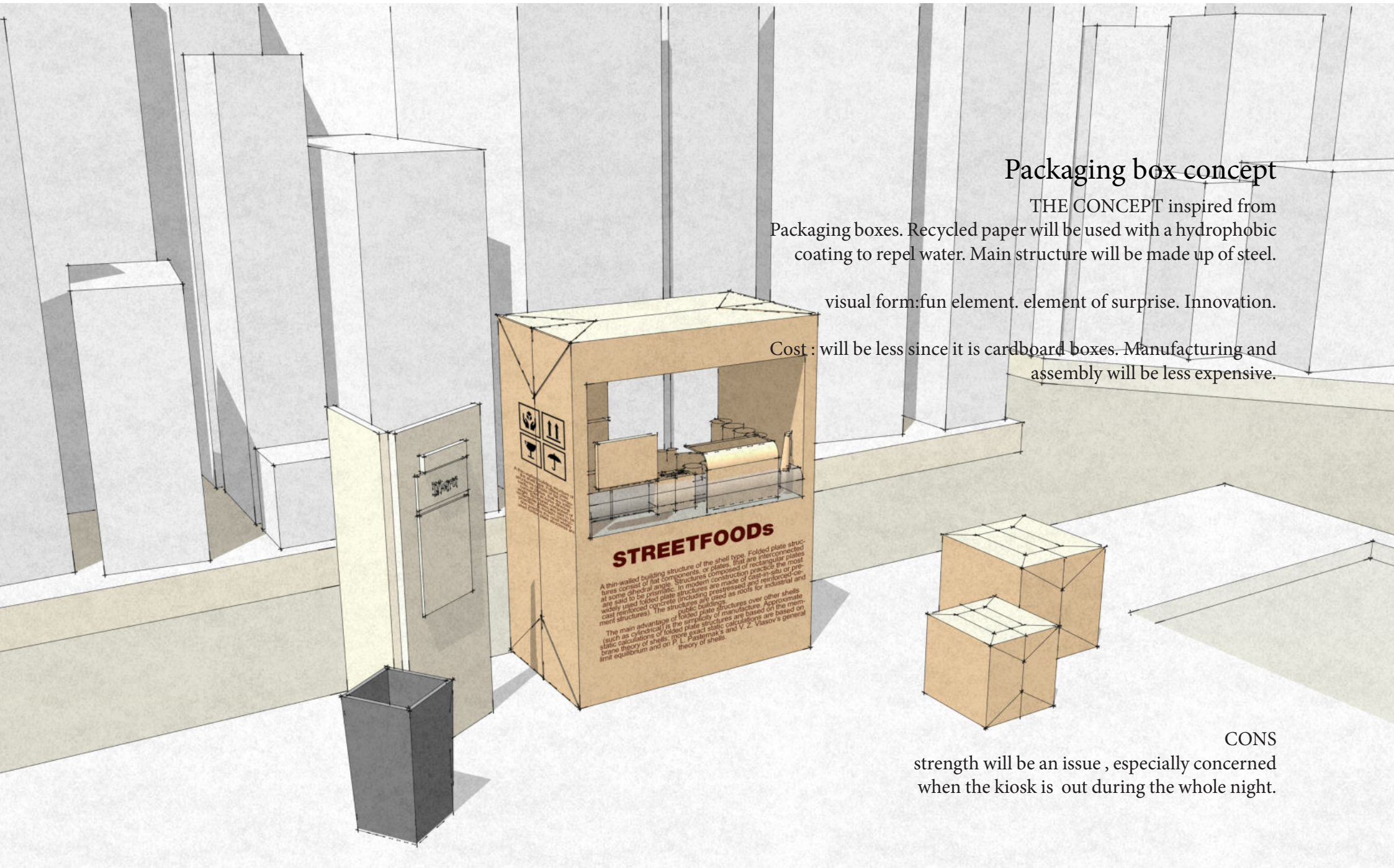
Visual form: there is no fun element, its not warming. Its is bit cold-expression. Simple construction methods, details , time & cost comes along with this concept. This will be easy to clean and maintain.

CONS

No fun element,feature of attraction.



Packagin box concept



Packaging box concept

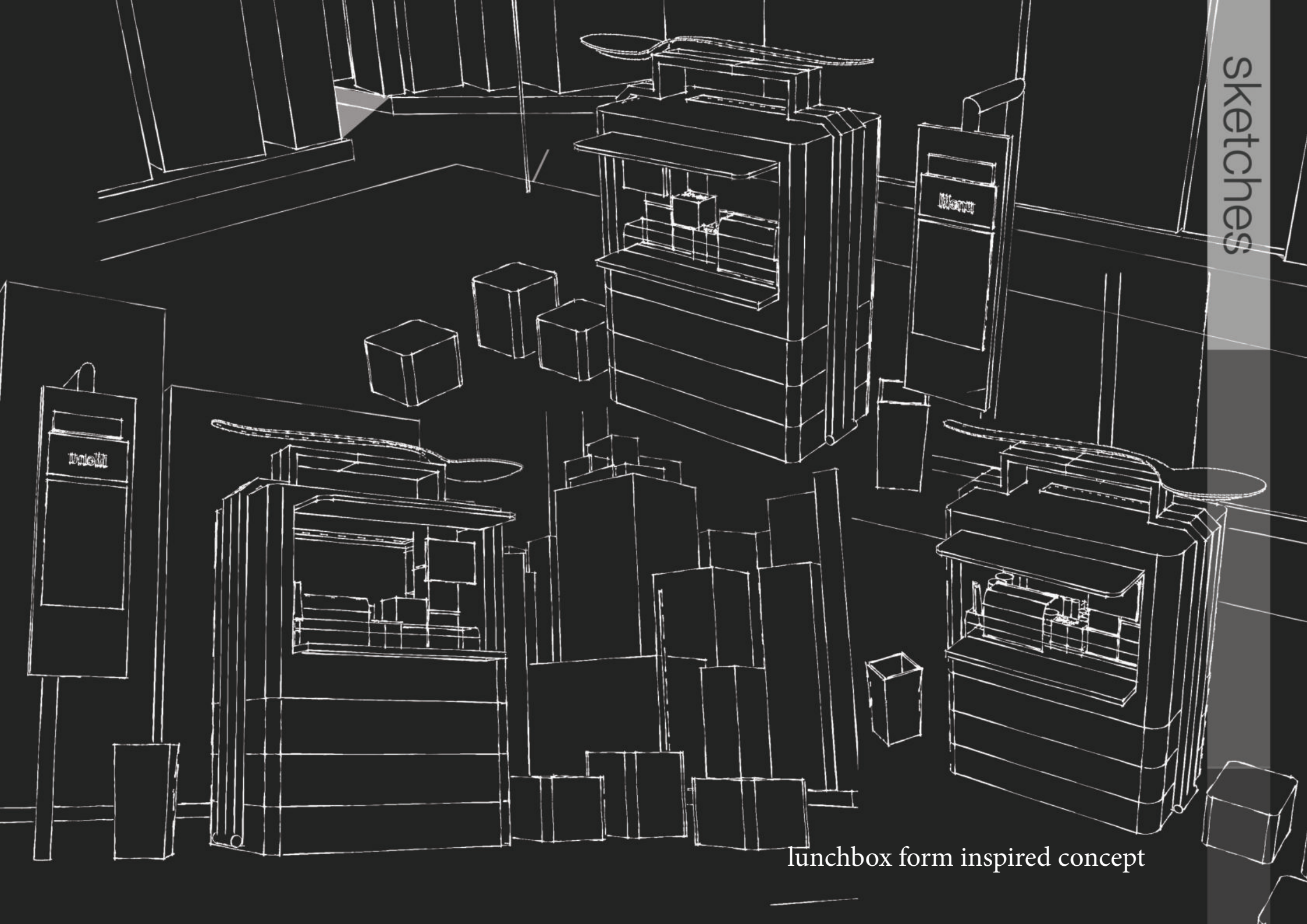
THE CONCEPT inspired from Packaging boxes. Recycled paper will be used with a hydrophobic coating to repel water. Main structure will be made up of steel.

visual form: fun element. element of surprise. Innovation.

Cost : will be less since it is cardboard boxes. Manufacturing and assembly will be less expensive.

CONS

strength will be an issue , especially concerned when the kiosk is out during the whole night.



lunchbox form inspired concept

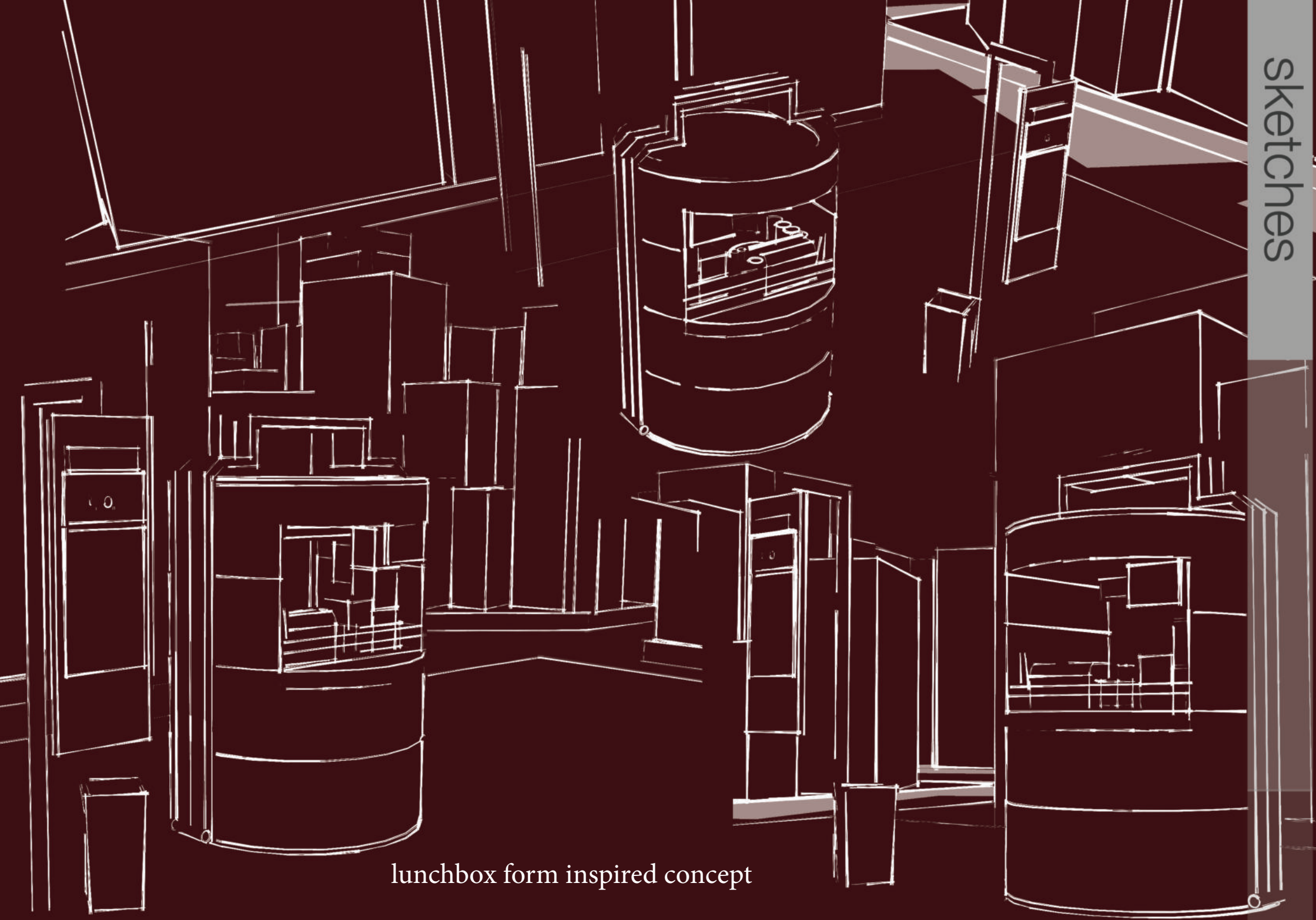
Lunchbox form inspired concept

THE CONCEPT inspired from tiffinbox/ lunch boxes. The form will have the language of a tiffin box/lunch box. Dabbas or tiffin-boxes are vessels usually people use to bring food from home packed. The form factor will make people associate the food with homely food. There is a spoon on top which will help to get noticed. The spoon will act as a lamp shade during night time. Different kiosks can have different types of spoon denoting different types of food. Like “dabbas” the kiosk will have different levels having different kinds of food.

Can be made with SS and FRP. This concept can be integrated with wheels. it can be called as LUNCHBOX on wheels.

Rectangular form

CONS
opening on 4 sides may effect the form factor. Cost may increase. Might not work well with all kinds of street foods.

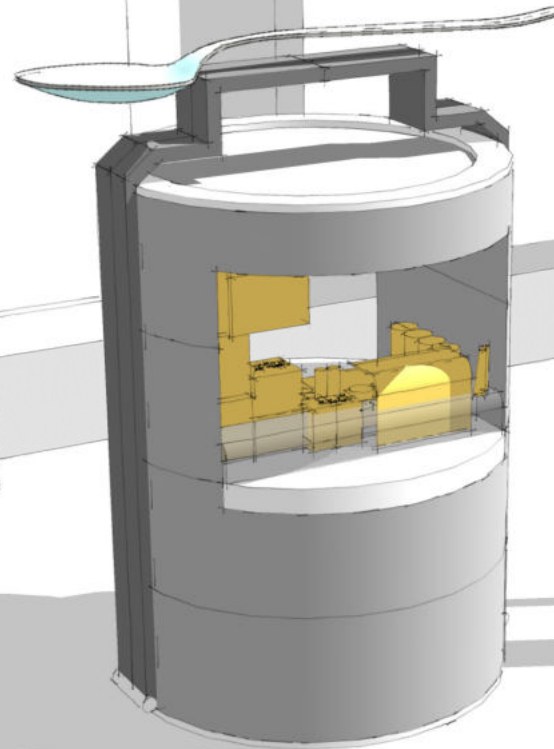


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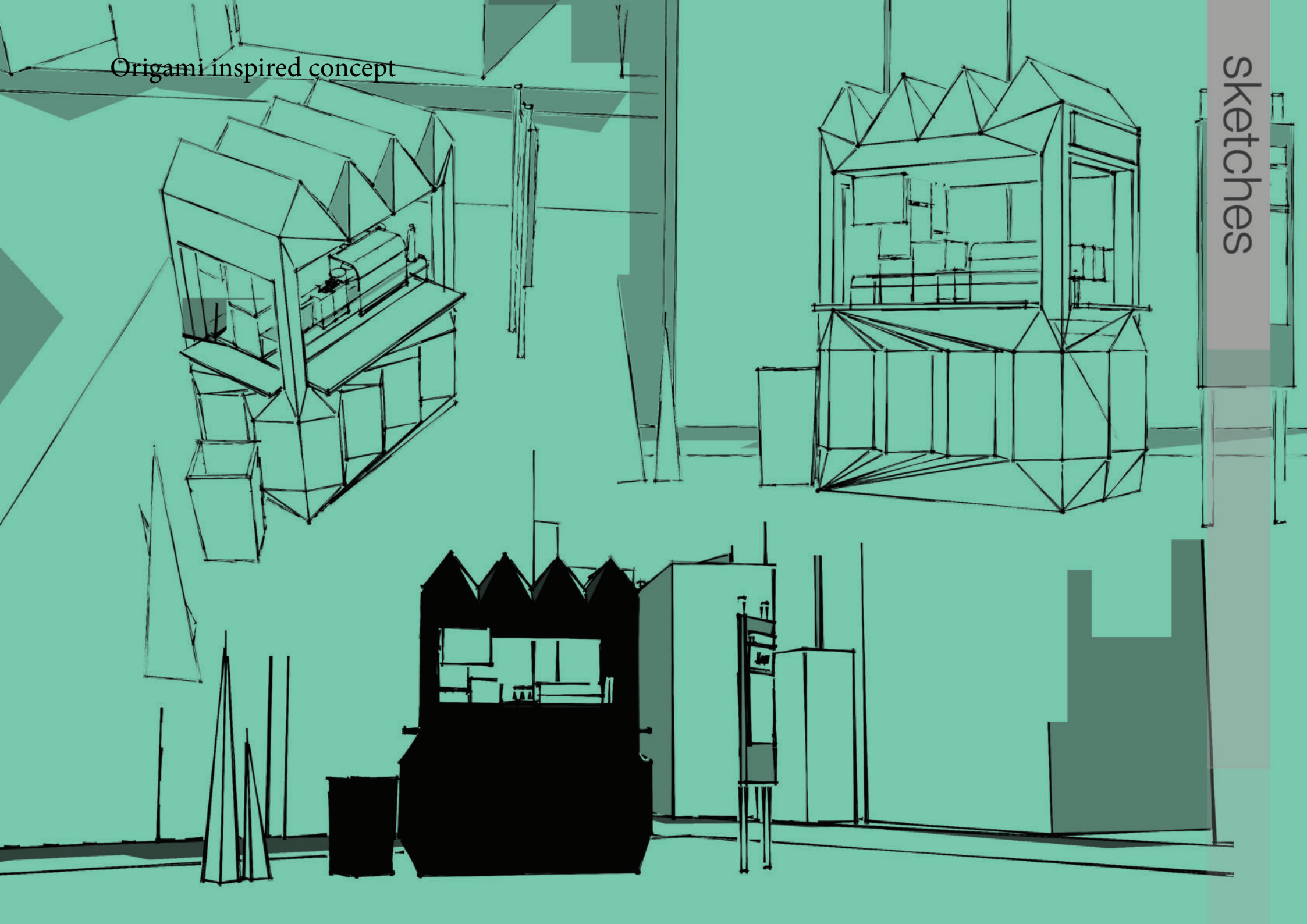


Circular form

CONS
opening on 4 sides may effect the form factor. Cost may increase. Might not work well with all kinds of street foods.

Origami inspired concept

sketches



Origami inspired concept

THE CONCEPT inspired from the foldings of Origami. In this company would give DIY kits of origami to the vendor. So then the vendor can create various forms and it will be customizable. The form would be fixed on top of the structure which will be made of Aluminum. The material will be coated with hydrophobic coating, so dirt and water wont get stuck on it.

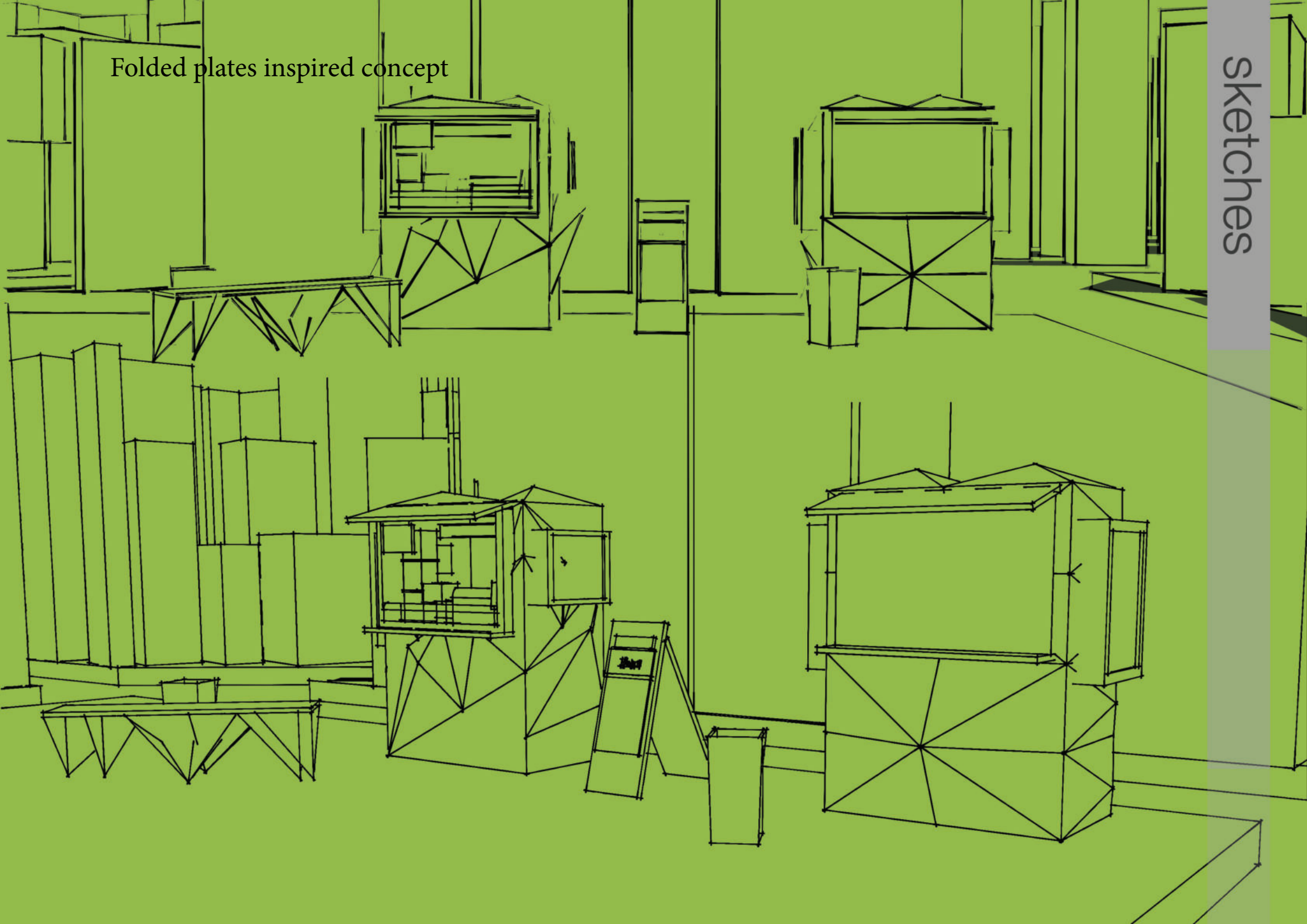
visual form - good aesthetics

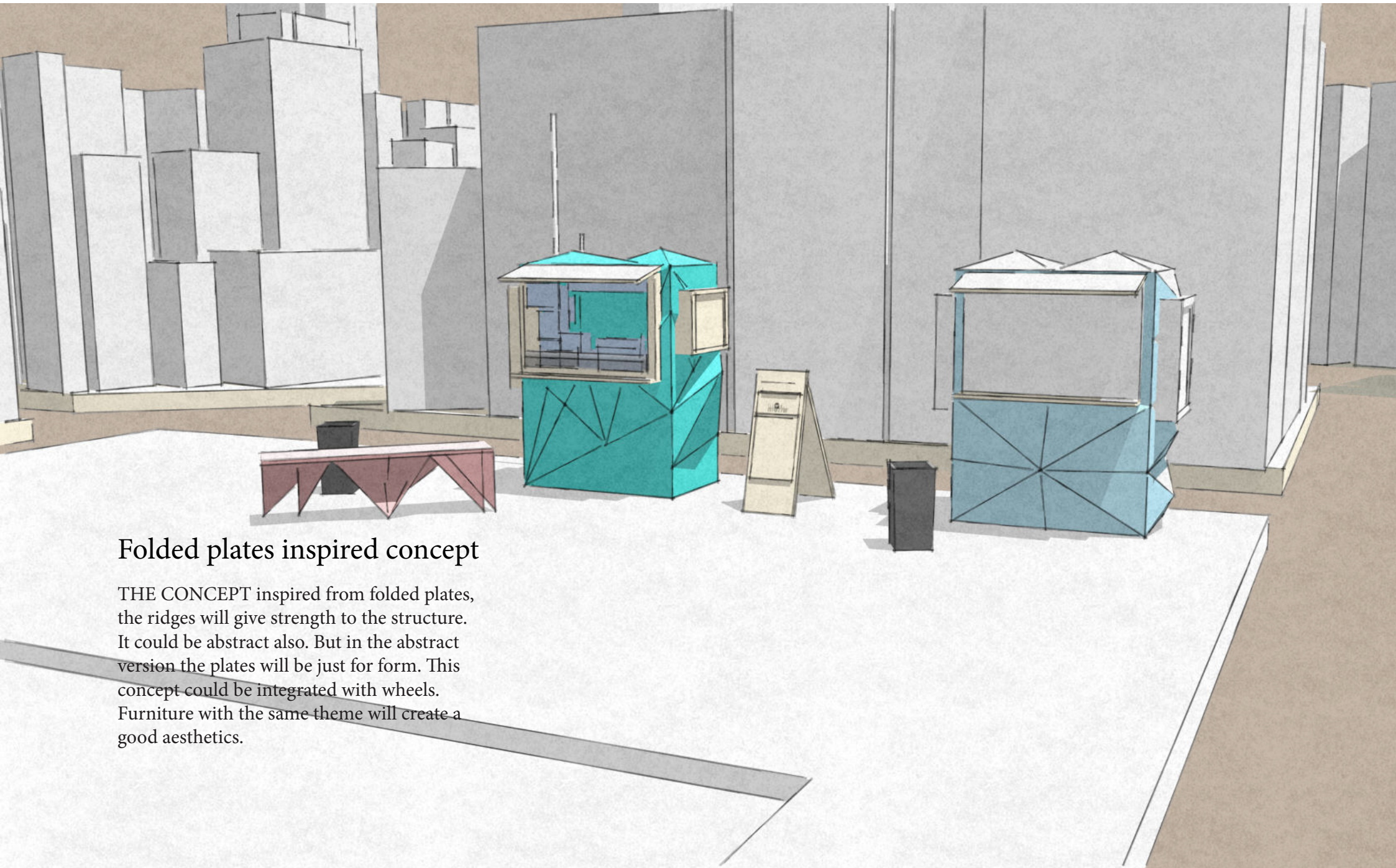


CONS
Cost of manufacturing will go high.

Folded plates inspired concept

sketches

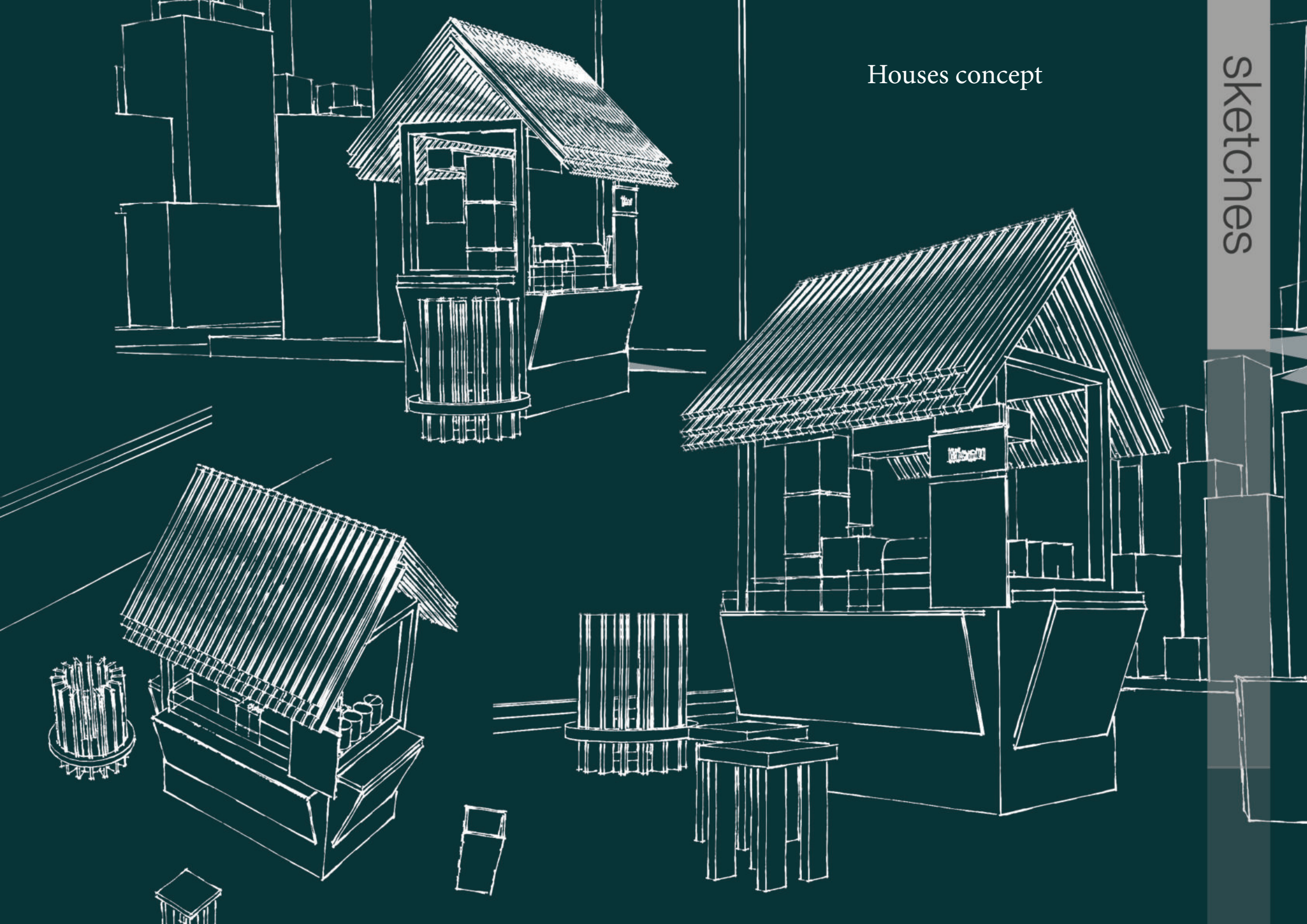




Folded plates inspired concept

THE CONCEPT inspired from folded plates, the ridges will give strength to the structure. It could be abstract also. But in the abstract version the plates will be just for form. This concept could be integrated with wheels. Furniture with the same theme will create a good aesthetics.

Houses concept

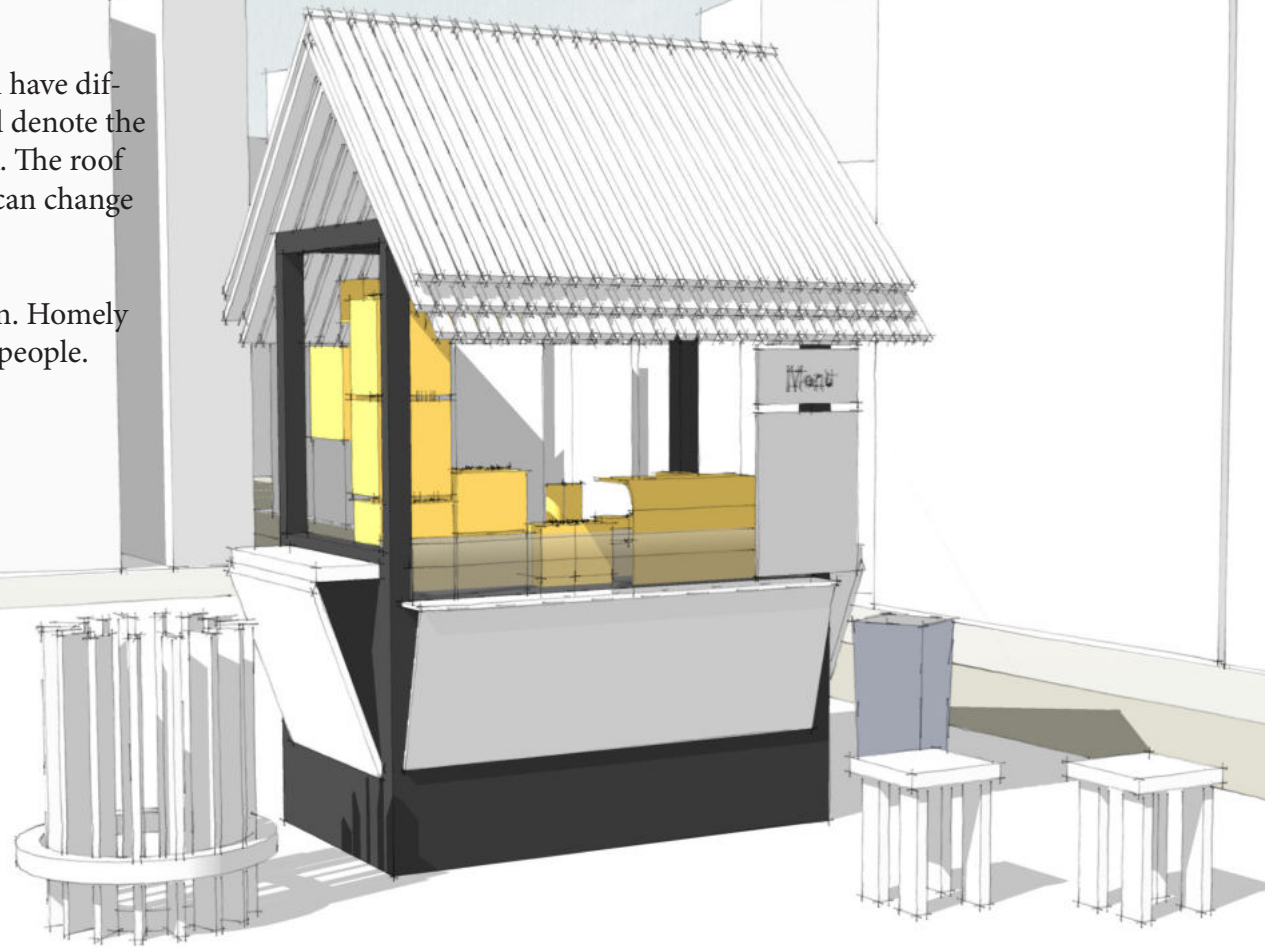


Houses concept

THE CONCEPT

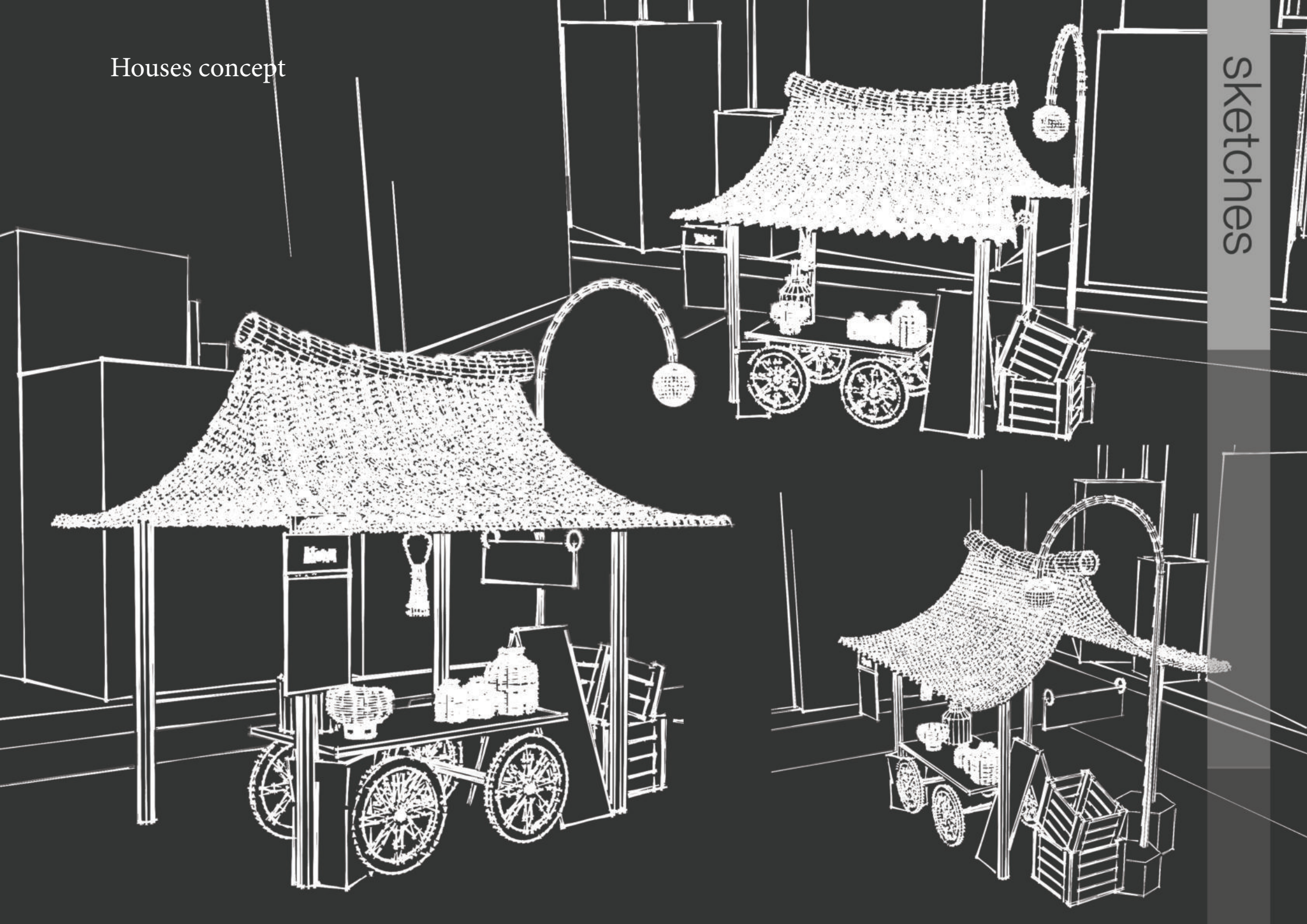
The concept is that the kiosk will have different types of roof. The roof will denote the food which is giving in the kiosk. The roof will be a separate module. They can change the roof whenever they want.

Will have a good visual attraction. Homely feeling. creates nostalgia among people.



Houses concept

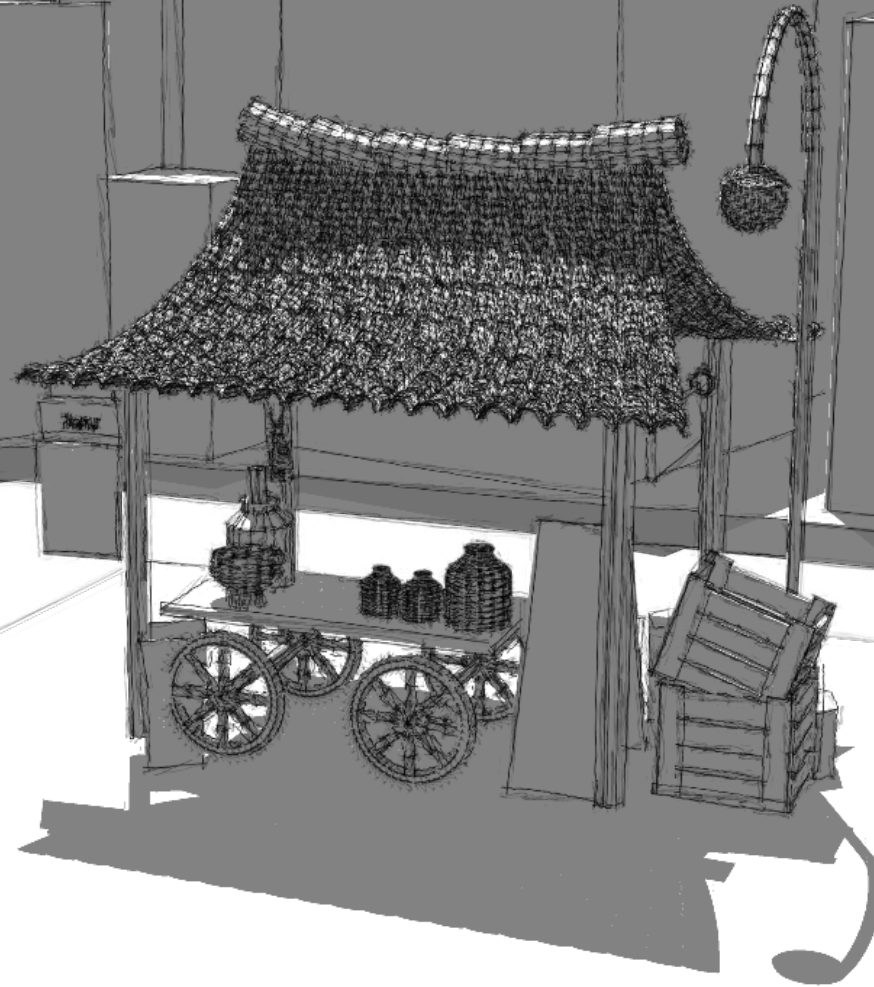
sketches



ROOF SHADES

THE CONCEPT froms a stand. The roof with four legs will be fixed. So any existing vendor can bring his/own cart under it and can sell food. The stand will give shade from sun/rain. these stands could be used as a place for people who dosent have homes to sleep in cities. Government can easily make these kind of stands and give different time slots to vendors. Creates permanent spaces as vending sites.

ALL vendors can use this shade. No vendor have to throw or sell his previous equipments.

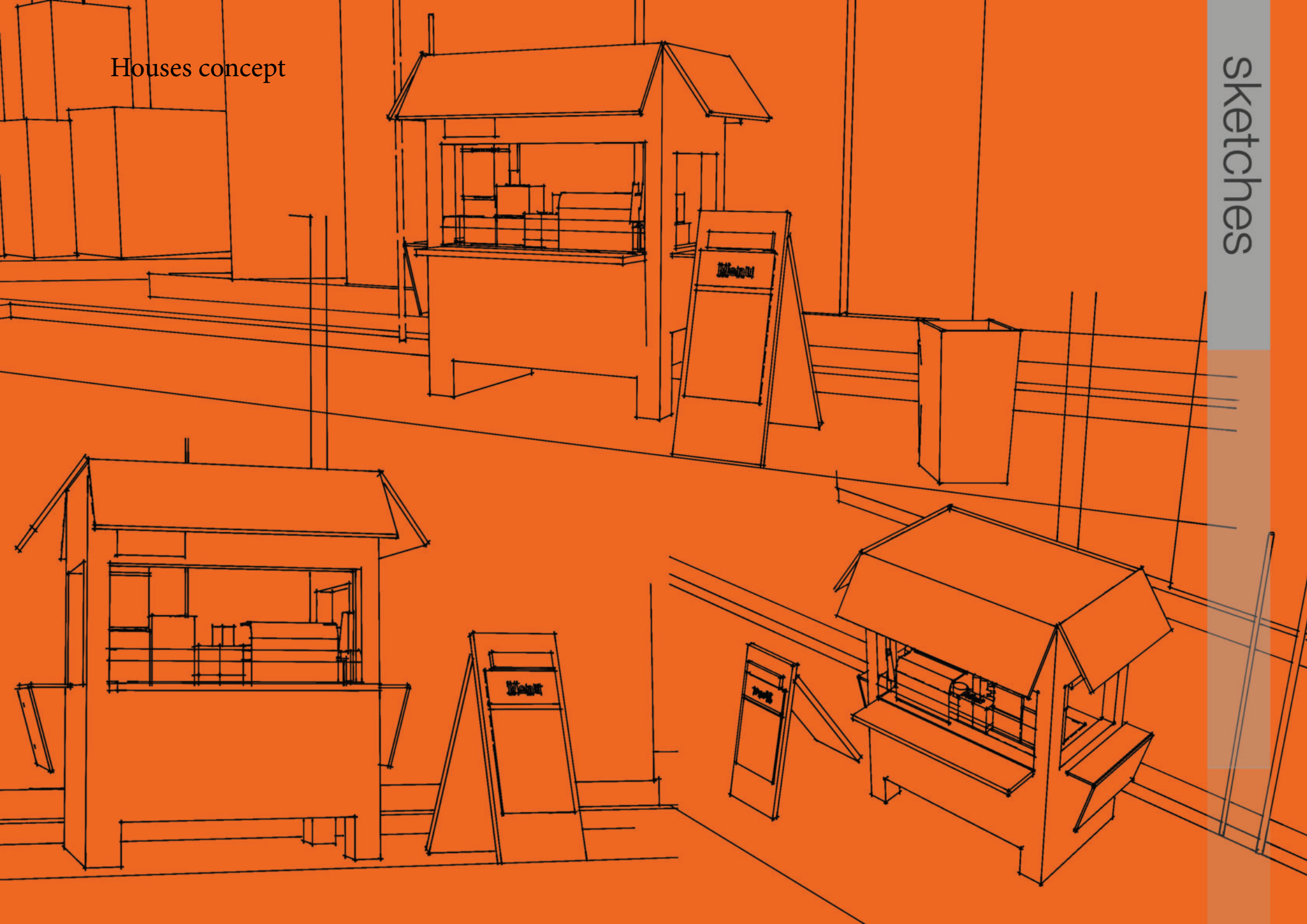


CONS

requires a permanent space.
Still the problems of carts will persist
since they use the existing cart.

Houses concept

sketches





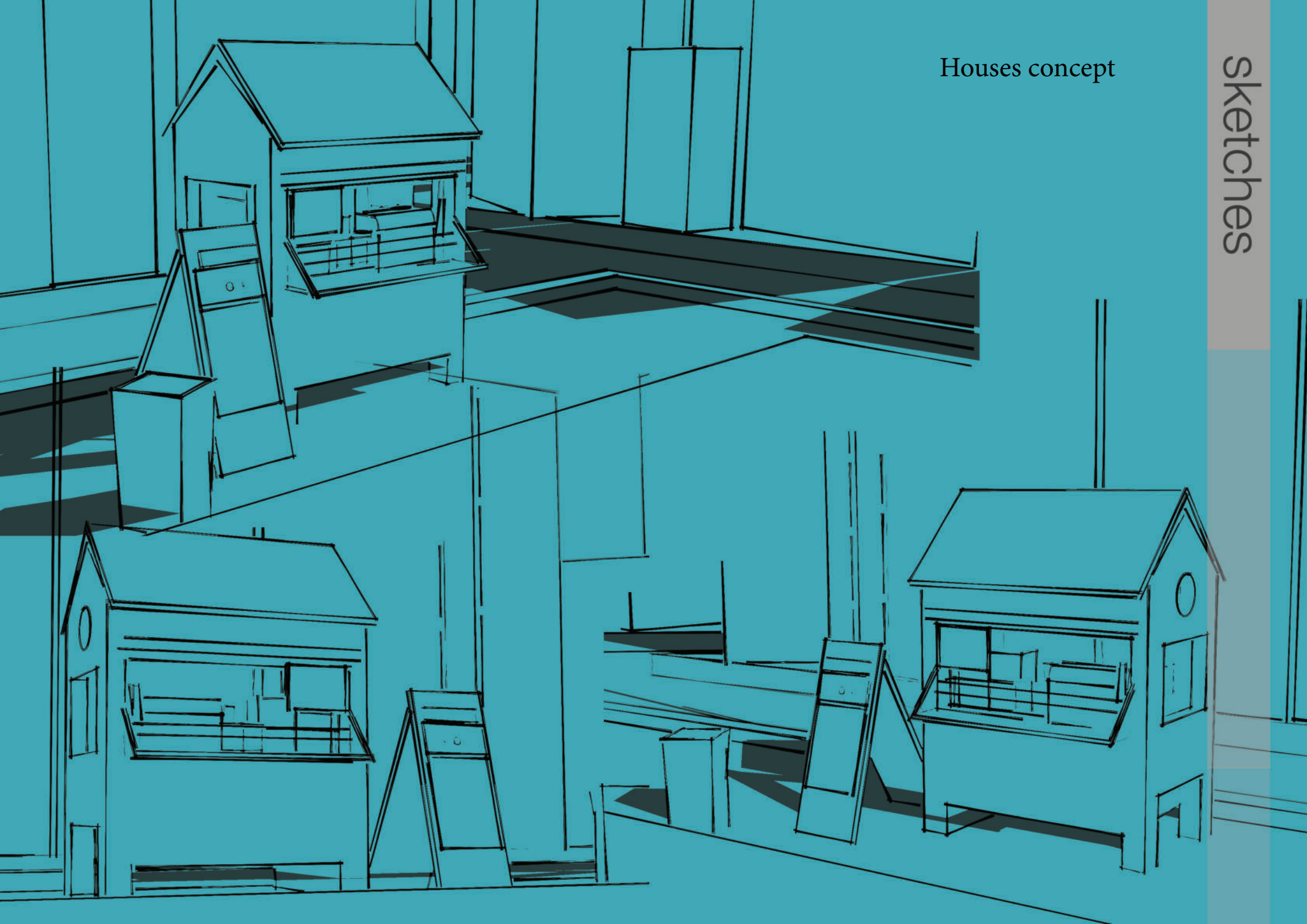
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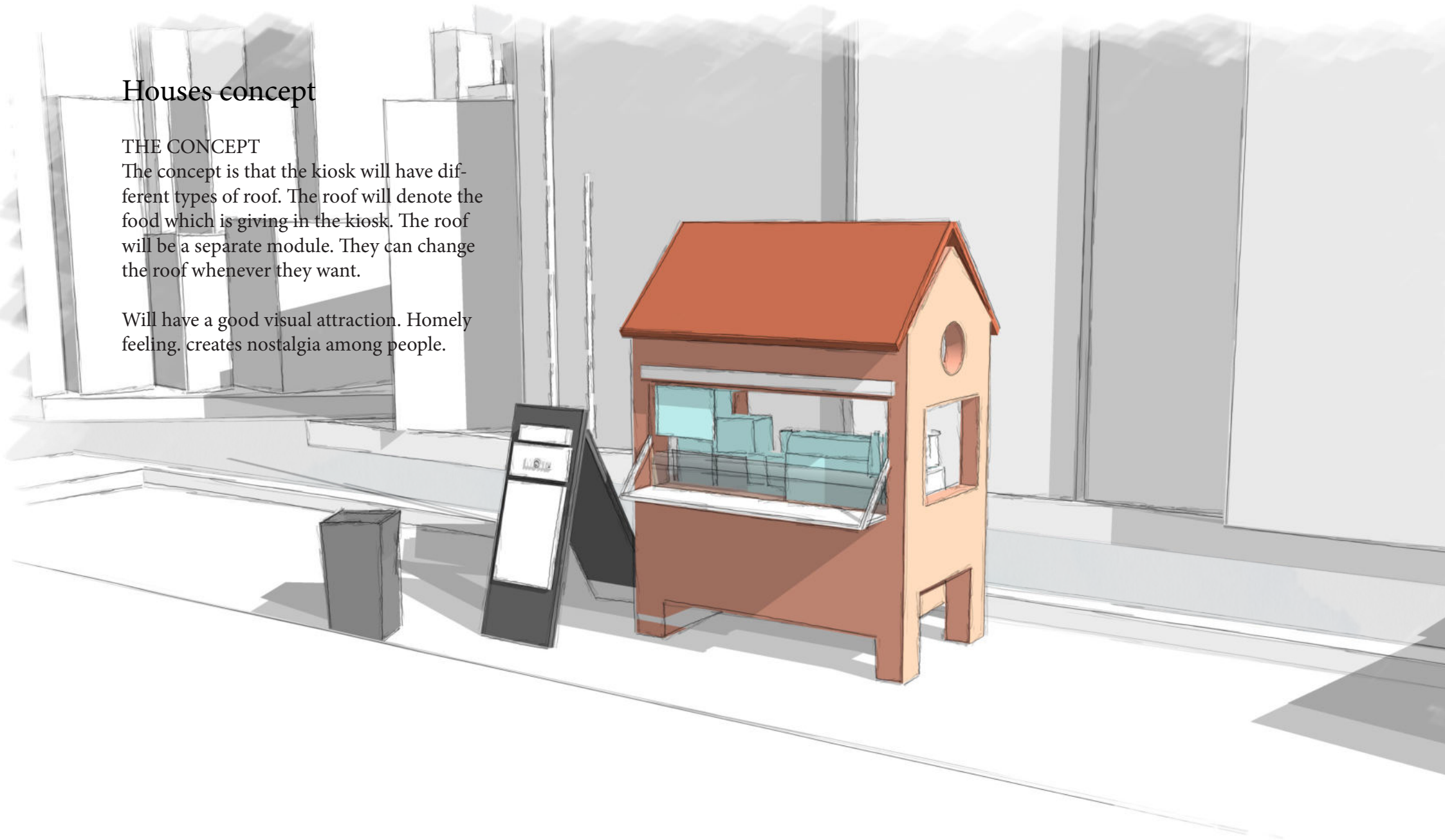


Houses concept

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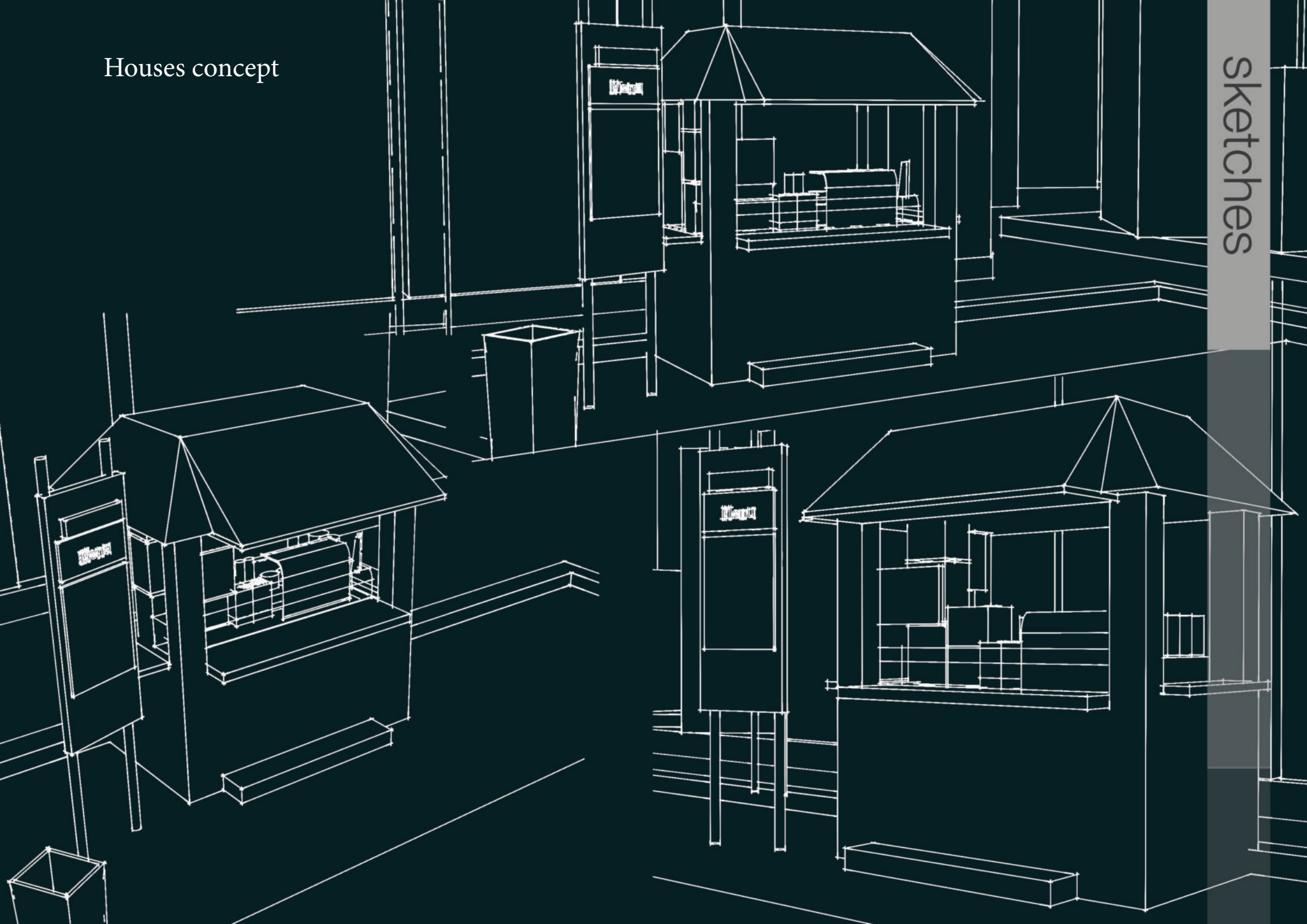
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Houses concept

sketches



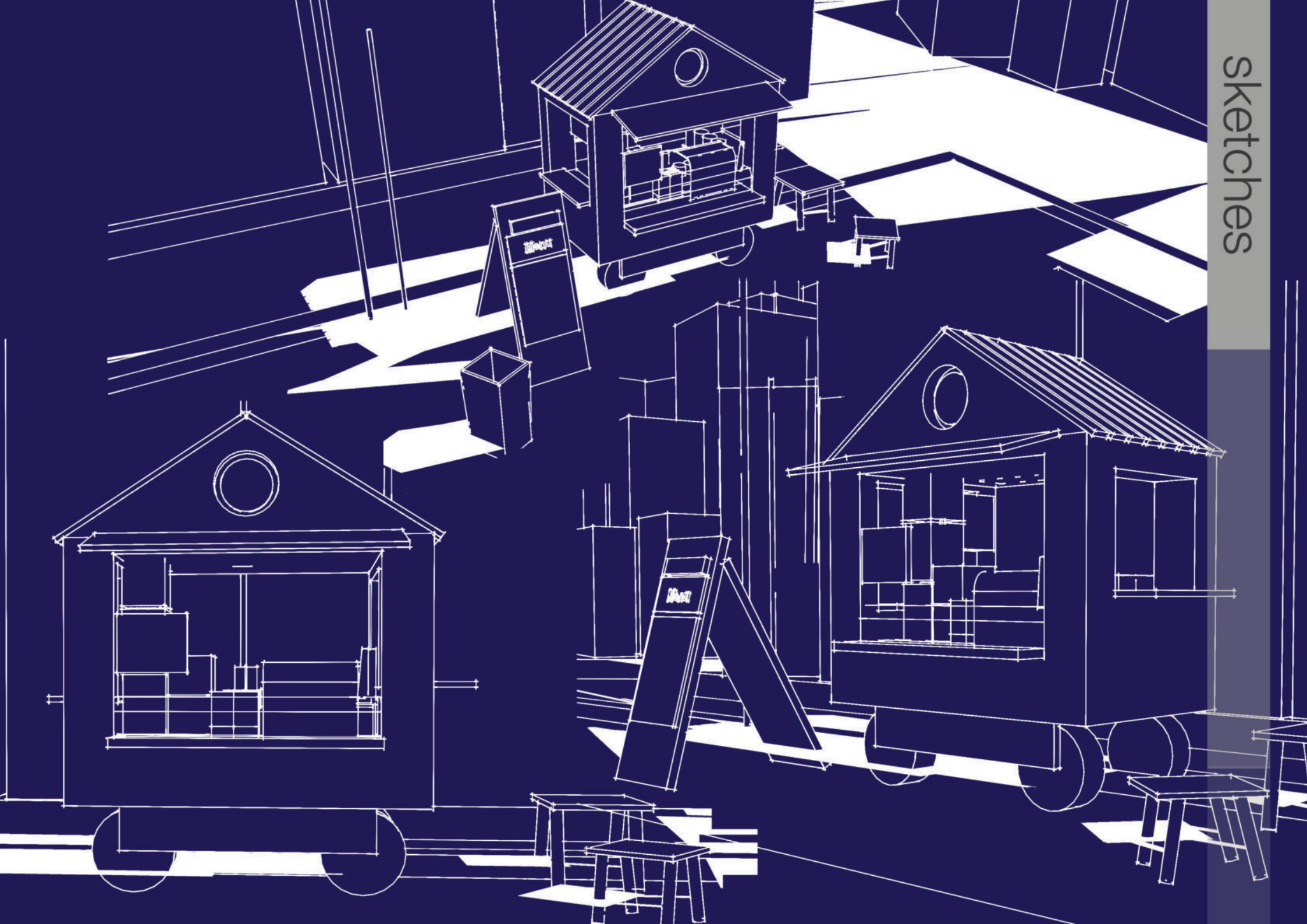


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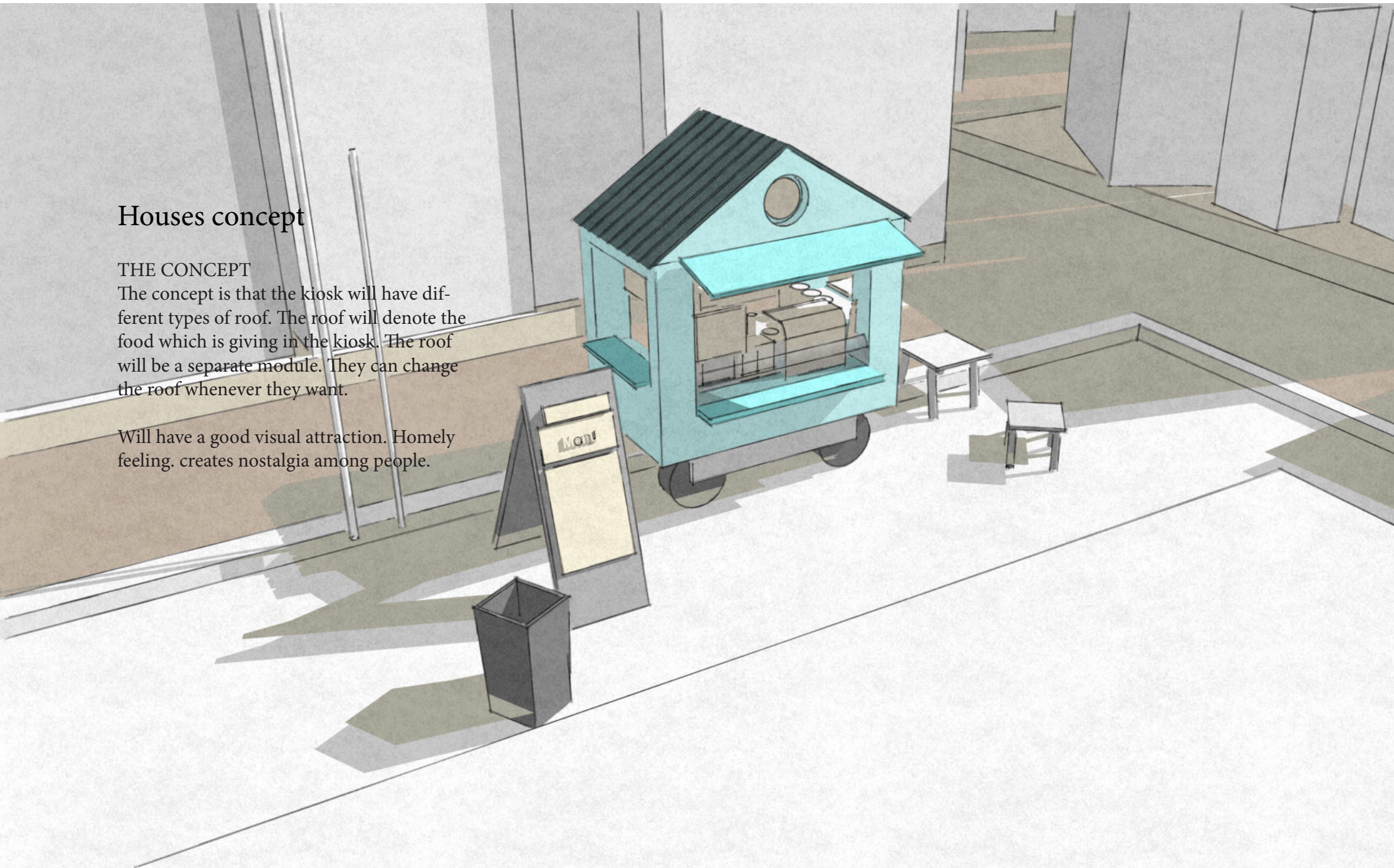


Houses concept

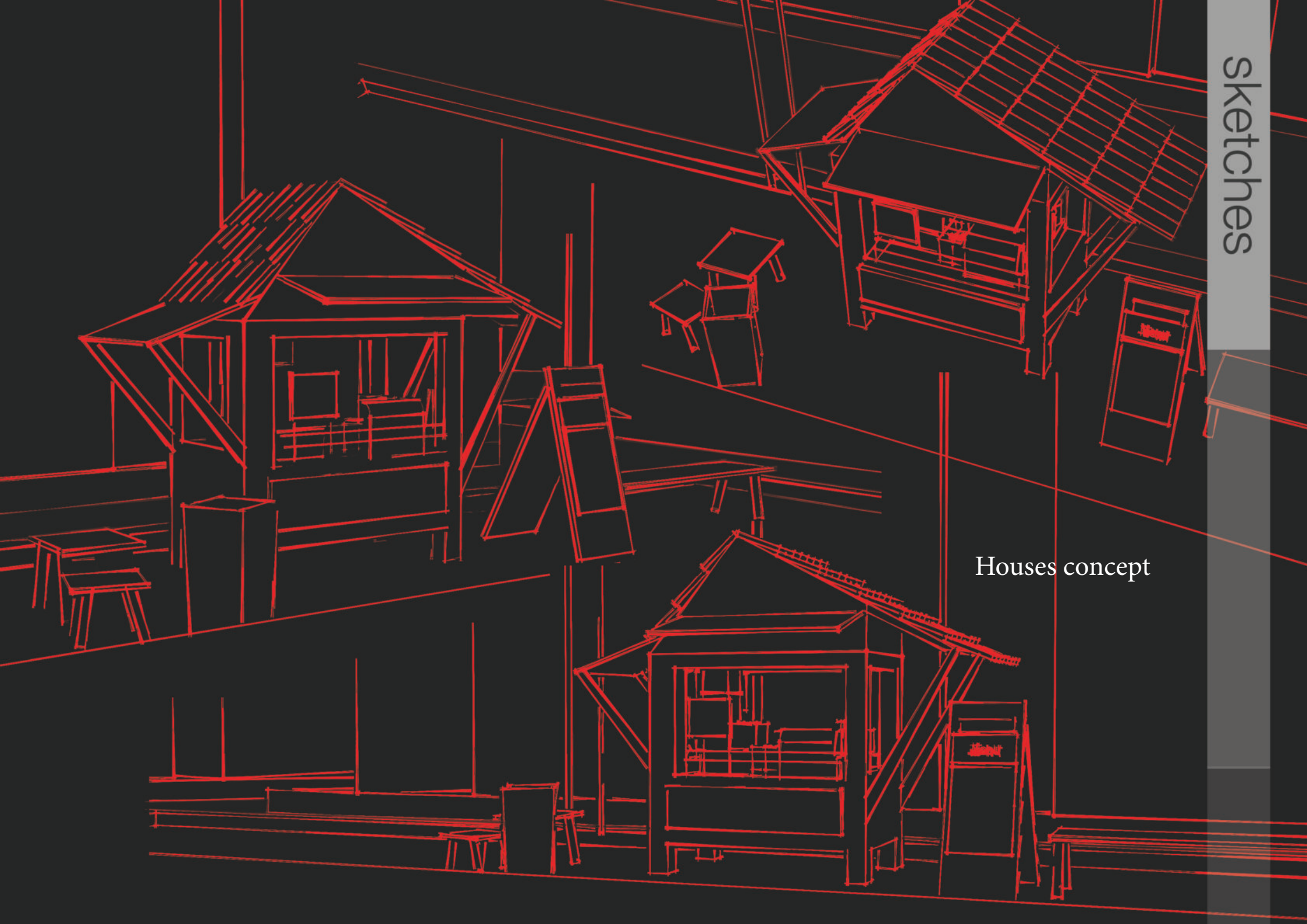
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Houses concept



Houses concept

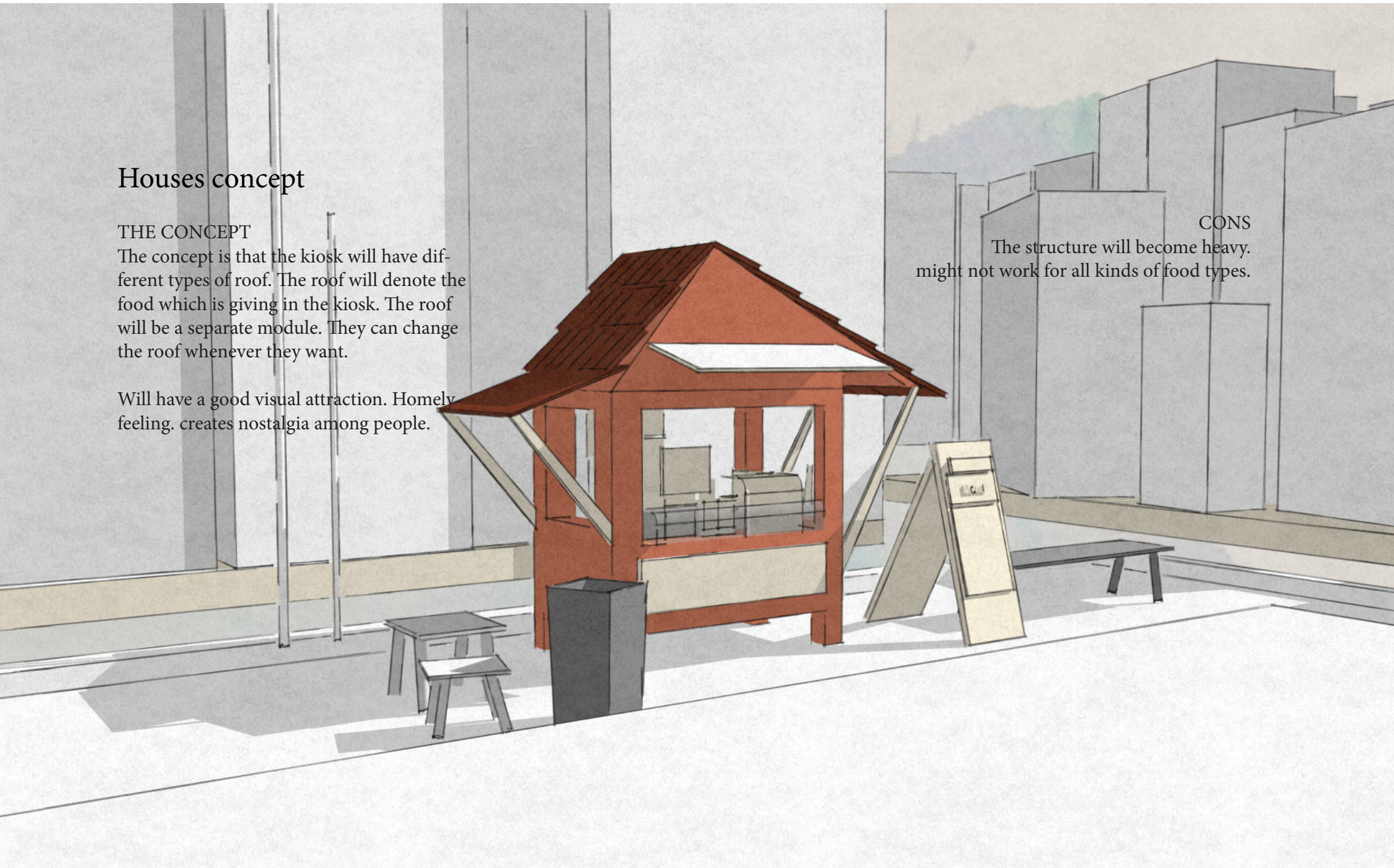
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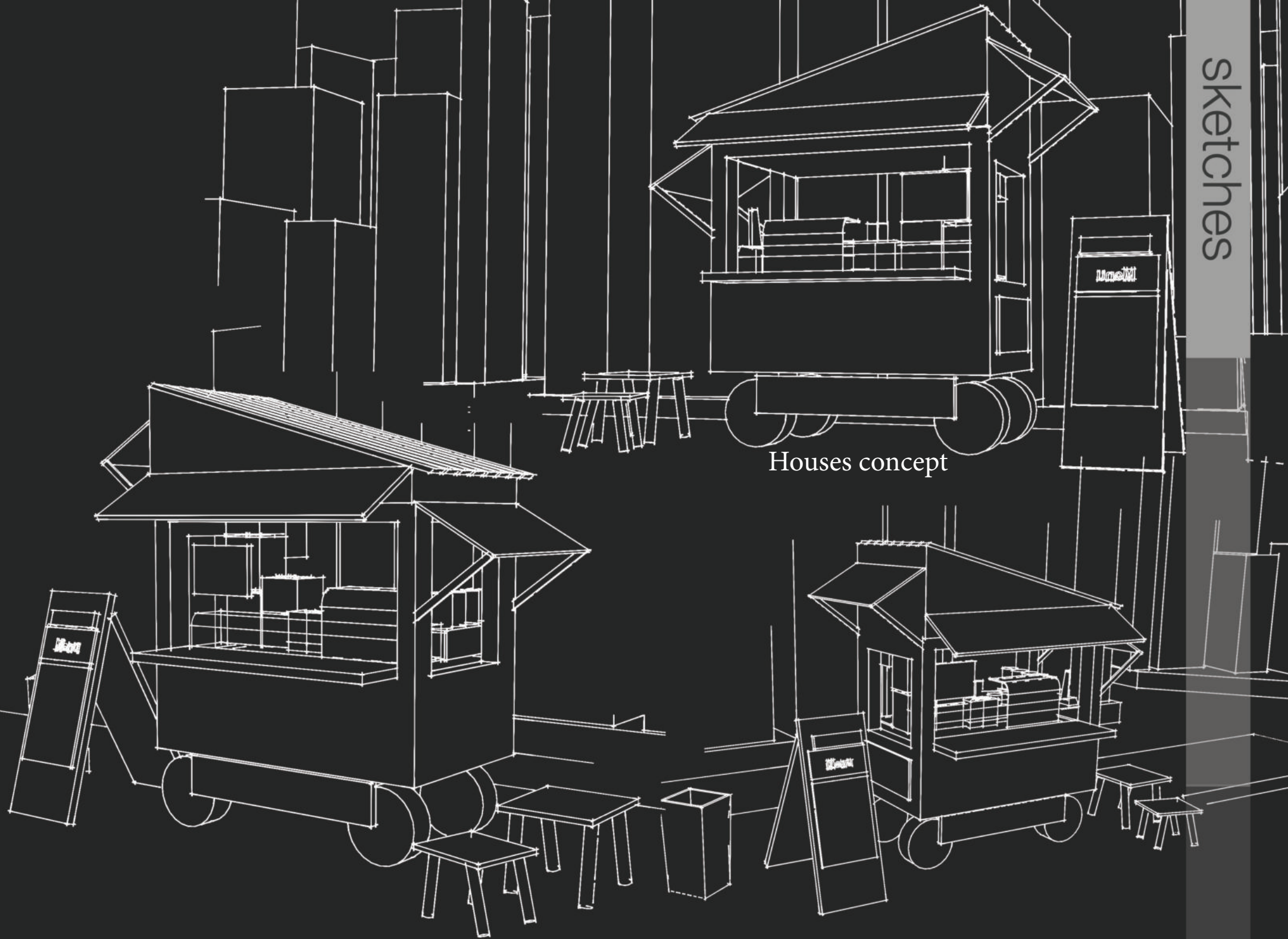
Will have a good visual attraction. Homely feeling. creates nostalgia among people.

CONS

The structure will become heavy. might not work for all kinds of food types.



Houses concept

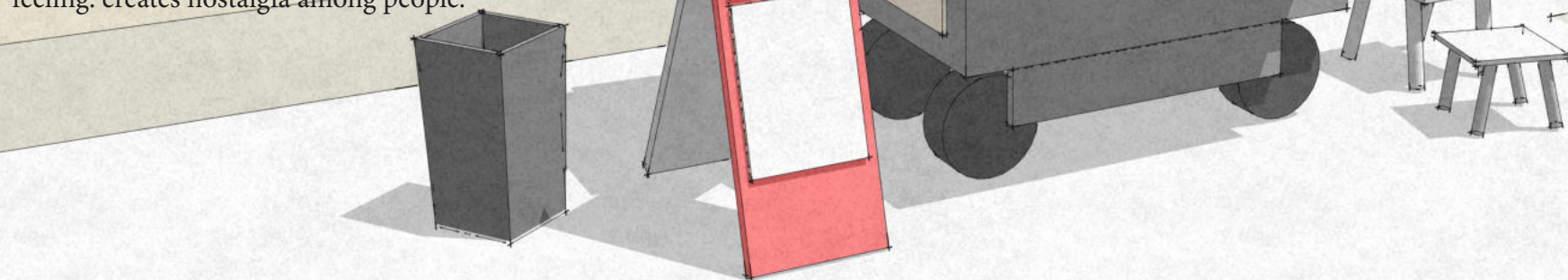


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Houses concept

Screening of ideas

All ideas has to be filtered and have to select the few good ones for the final concept evaluation. The concepts were individually evaluated on the basis of various aspects and 8 concepts are selected/shortlisted for final evaluation.

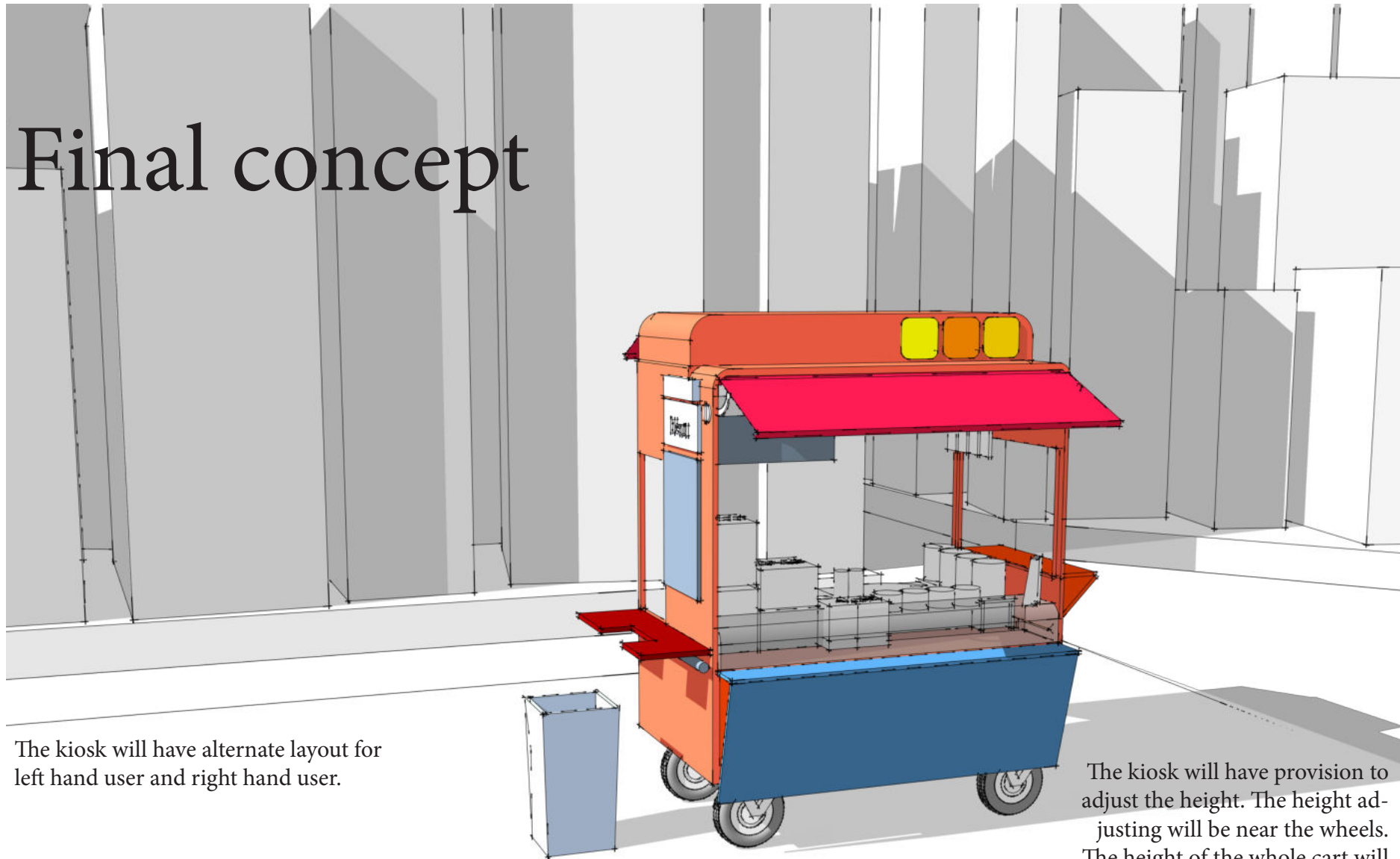


Concept evaluation

	Colour & graphics	Algae	Glass	Box	Oven	House	Lunch box	Bamboo
Form dominance	5	6	7	6	9	8	9	6
Visual attraction	6	9	7	6	8	7	6	7
Innovativeness	4	9	6	8	9	6	7	6
Structure complexity	9	4	4	7	4	6	4	7
Maintenance factor	8	4	4	6	4	6	7	8
Cost	7	3	3	6	4	5	5	7
Manufacturing Complexity	6	2	4	5	3	5	4	5
Self –contentedness	7	9	8	7	9	9	6	7
Appropriateness in the Indian context	9	6	5	7	8	9	8	8
Total	61	52	48	58	58	61	56	61

Considering the time constraint and other aspects, now I am proceeding with the color and graphics concept

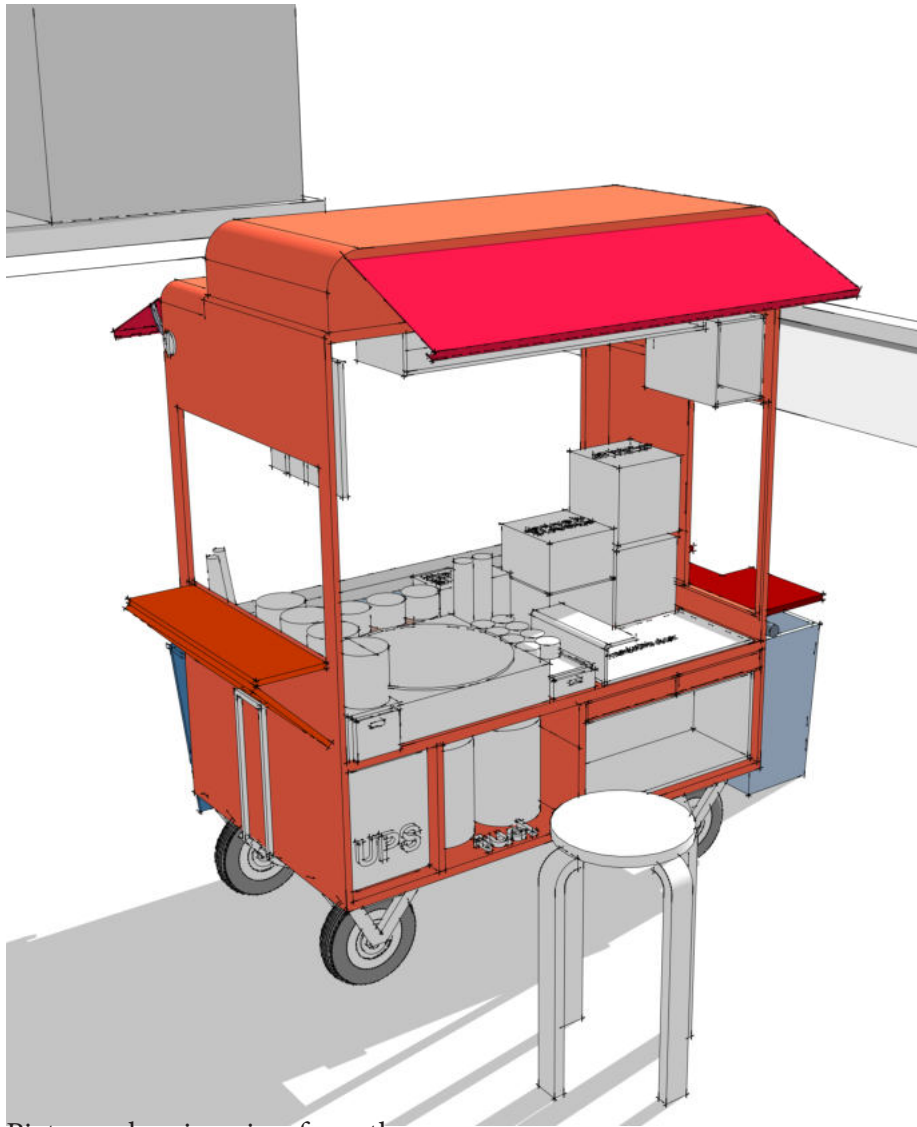
Final concept



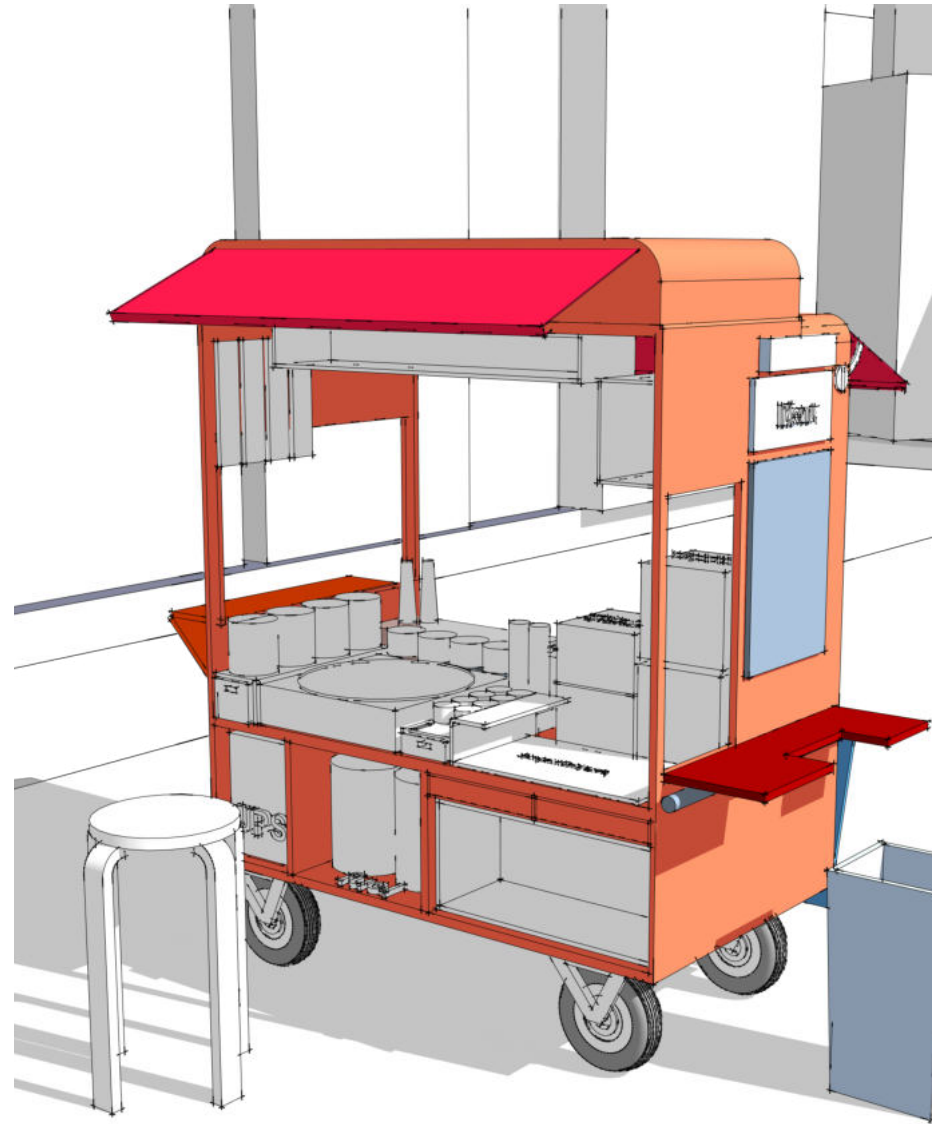
The kiosk will have alternate layout for left hand user and right hand user.

The kiosk , now can be arranged to the requirement of different food types like Vada pav, Dosa items, parathas, rotis, bread & sandwich items, tea, snacks etc.

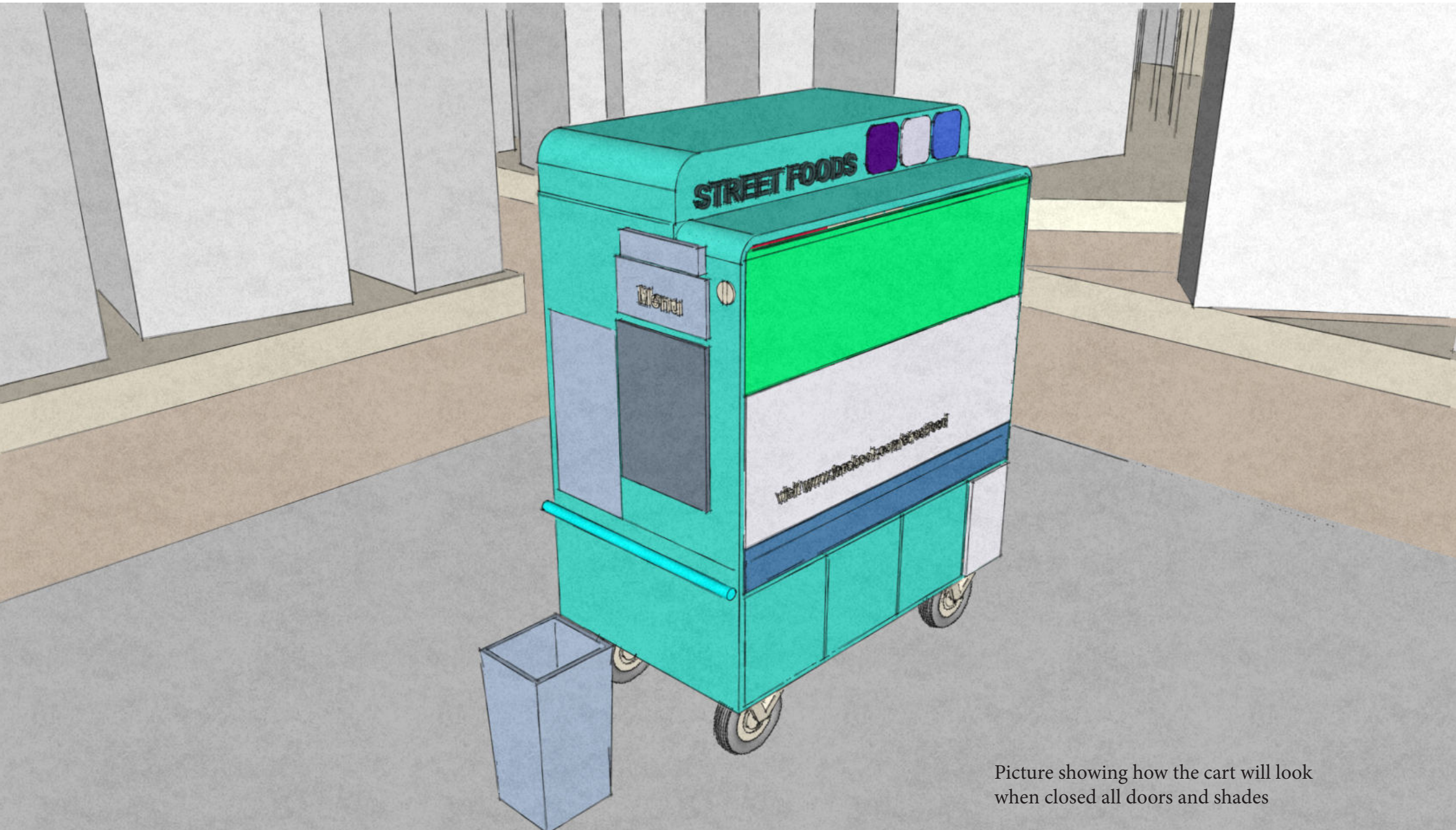
The kiosk will have provision to adjust the height. The height adjusting will be near the wheels. The height of the whole cart will be adjusted to the height of 5th, 50th and 95th percentile people.



Pictures showing view from the side where vendor stands.



Final concept



Picture showing how the cart will look when closed all doors and shades

Participatory design

This is one of the critical stage of the design process. Feedback from the vendor & customers. Feedback about the accessibility, reach to spaces, fit of objects etc were evaluated from the rig. Also sketches of final concept is also shown to the vendor.

Rig making

The rig is made using aluminum box sections. The main idea of the rig is to test the usability of spaces. The actual weight, strength will be varied. The frame is constructed according to designed size. It is also noted that the kiosk was mounted on top of 17" benches while testing, which will vary the test a bit.

Photos taken while making the rig.



Drilling through the flat L-angle to make give more reinforcement at the corners





Mirza .S. Askari ,an enthusiast in cooking, is the owner of a small restraunt named sunrise dhaba. He sells various items there like wraps and rolls, Rice items , veg or non-veg chinese dishes . tea , snacks etc. He has separate spaces for cooking different items. The cooking space for wraps and rolls is similar to that of the street food carts. But since it is part of the restaurant problem of lack of space is less there.

Why he can give feedback? Why his feedback is relevant?
Even though he has a restaurant, and not a street food kiosk, he can validate the process of cooking Frankie wraps & rolls and other cooking process. He also has well knowledge about various cooking methods and dishes.

Photos taken while the feed back session with the vendor



Photos taken while the feed back session with the vendor

General feedback

- Use of wood inside cart should be carefully used since cockroaches and other bugs might breed between them. Also spilling of hot and cold food items will spoil it.
- Care should be observed while handling cooking equipments.
- Keeping of oils or other flammable materials near the stove should be avoided
- High pressure and low pressure valves should be used accordingly.



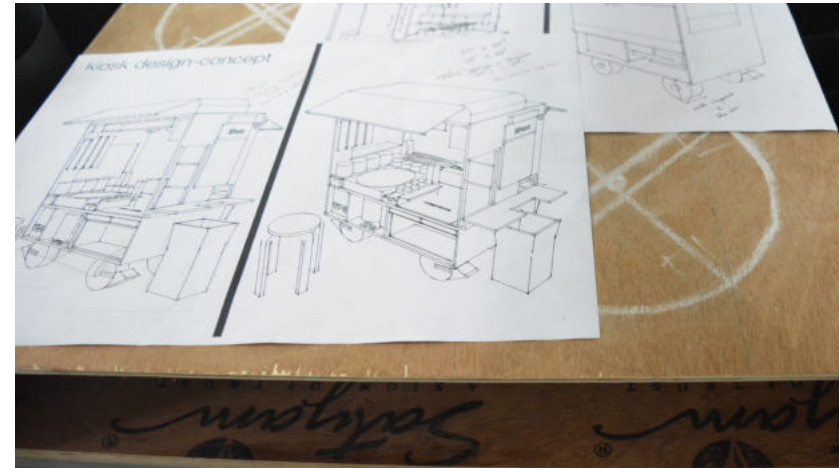
Design feedback

- Provision for storage space for 5kg gas might not work well as estimated. Availability is one issue, also the gas might finish quickly .
- A cover or shade near cooking space would be appropriate to protect from hot smokes, flames and oils.
- The roof of cart should be made such that smoke should not stay inside. Also the material should be carefully selected so that cleaning will be easy.
- use of steel will help to clean and will be long lasting, and easily available.
- Use of tissue is appropriate for the design.
- Overall design is good. The flexibility in space will attract vendors.
- wheels are good , but detailing has to be done carefully.

Finalization of concept with the considering the feedback before the detailing

Customer feedback

Photos taken while the feed back session with the customers





photos taken while the feed back session with the customers





Photos taken while the feed back session with the “customers”

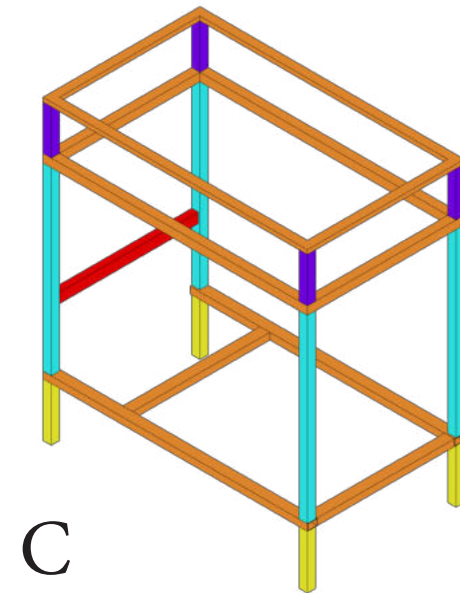
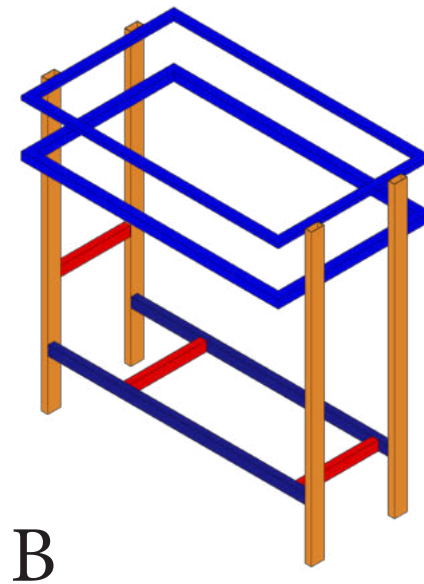
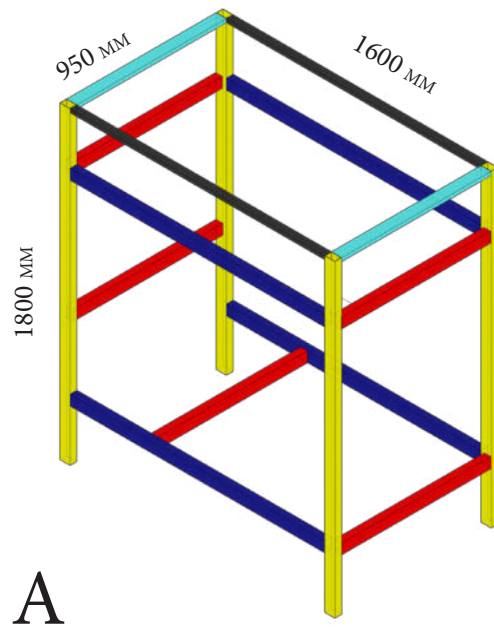


What next?

After the testing by vendor and feedback from “customers” the points were taken, and then analyzed. Some points were taken further to modify the design concept.

Structure exploration - Main frame

Box section - Mild steel



Structure exploration - Main frame

Rectangular Box section - Mild steel

Availability: Easily available

Life & Chances of failure : The box section has a good life, chances for failure are less . For the kiosk design I will be using 2mm and 3mm rectangular box sections.

Strength : Great strength

Replacement & repair : Doesn't need to replace or repair for around 3-5 years if the sections are properly coated with anti-rust coating. If only in-cases of heavy impact replacement or repairing is required.

Maintenance & Cleaning(Bugs and insects): It is easy to clean the surfaces, if the end sections are closed with an air tight cap bugs wont enter inside. Also it is not a friendly material to insects.

Time: To make and assemble is comparatively low with other sections since all four sides are flat.

Complexity: less complex

Volume : consumes more volume than L-section and circular section

Weight : More weight

Workmanship : Doesn't require highly skilled laborer.

Joinery

Complexity to make : less complex

Availability : Easily available

Workmanship : Normal level

Special tools not required

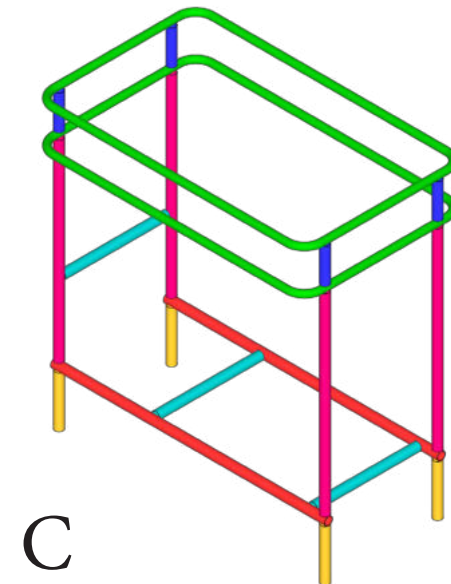
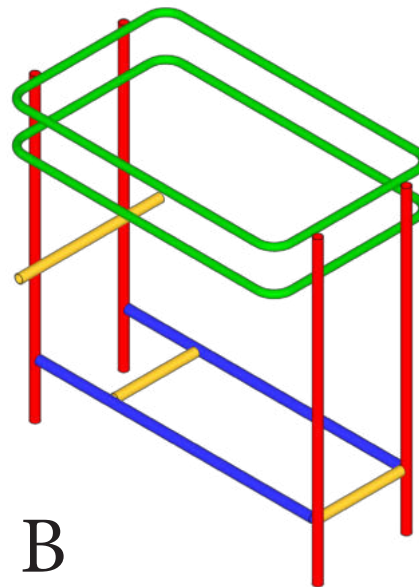
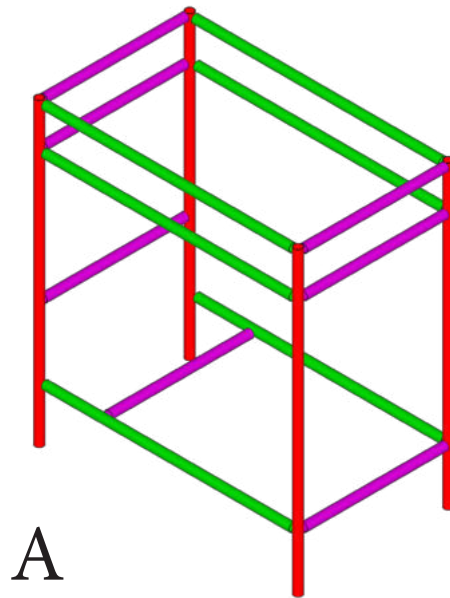
Strength : Good strength

Ease of fastening : fast

Cost : Depend on the complexity

Volume : less volume if it internal joints

Structure exploration - Main frame
Circular section - Mild steel



Structure exploration - Main frame

Circular section - Mild steel

Availability: Easily available

Life & Chances of failure : The circular section has a good life, chances for failure are less . For the kiosk design I will be using section of thickness 2mm and 3mm

Strength : Great strength

Replacement & repair : Doesn't need to replace or repair for around 3-5 years if the sections are properly coated with anti-rust coating. If only in-cases of heavy impact replacement or repairing is required.

Maintenance & Cleaning(Bugs and insects): It is easy to clean the surfaces, if the end sections are closed with an air tight cap bugs wont enter inside. Also it is not a friendly material to insects. More easy to clean than rectangular section, L-section and X-section.

Time: To make and assemble is comparatively low with other sections since all four sides are flat.

Complexity: less complex

Volume : consumes more volume than L-section

Weight : More weight

Workmanship : Doesn't require highly skilled laborer.

Joinery

Complexity to make :More complex

Availability : Depends on the complexity

Workmanship : Normal level

Special tools might be required

Strength : Good strength

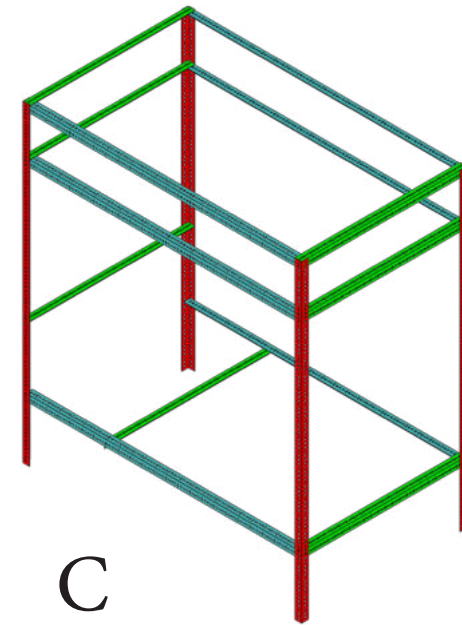
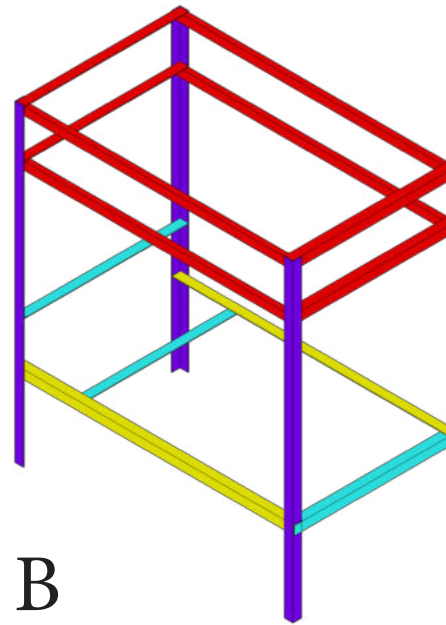
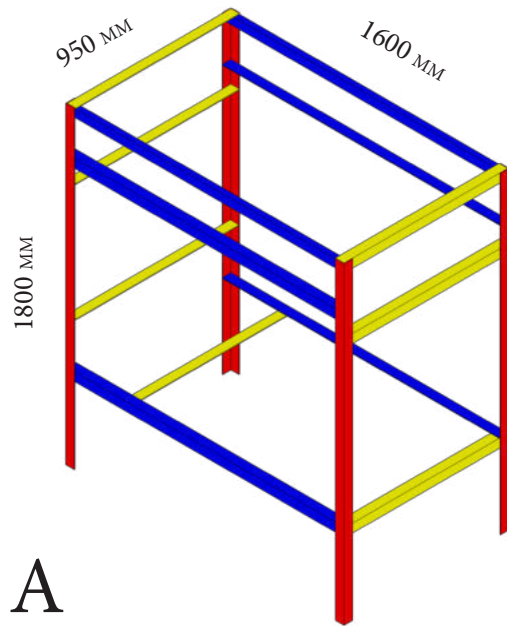
Ease of fastening : fast

Cost : Depend on the complexity

Volume : less volume if , internal joints

Structure exploration - Main frame

90 degree Angle- section - Mild steel



L - section - slotted

Structure exploration - Main frame

90 degree Angle - section - Mild steel

Availability: Easily available

Life & Chances of failure : The L-section also has good life. But the life depends on the forces acting in the direction reference to the cross section.

Strength : Great strength along the length(More good for tensile

Replacement & repair : Doesn't need to replace or repair for around 3-5 years if the sections are properly coated with anti-rust coating. If only in-cases of heavy impact, replacement or repairing is required.

Maintenance & Cleaning(Bugs and insects): It is easy to clean the surfaces, if the end sections are closed with an air tight cap bugs wont enter inside. Also it is not a friendly material to insects.

Time: To make and assemble is comparatively low with other sections since it doesn't really require additional joinery

Complexity: less complex

Volume : consumes less volume.

Weight : less weight compared to others.

Workmanship : Doesn't require highly skilled laborer.

Joinery

Complexity to make : Less complex

Availability : Depends on the complexity

Workmanship : Normal level

Special tools might not required

Strength : Good strength

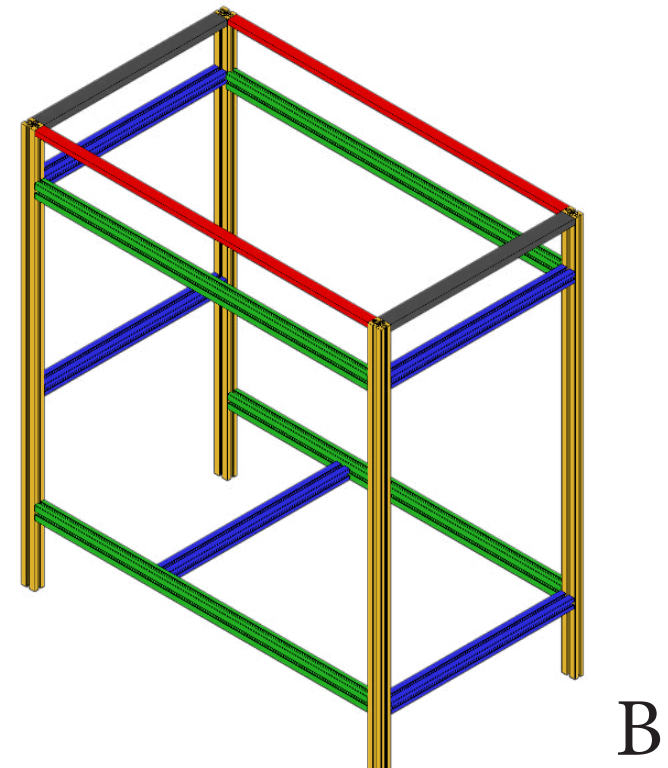
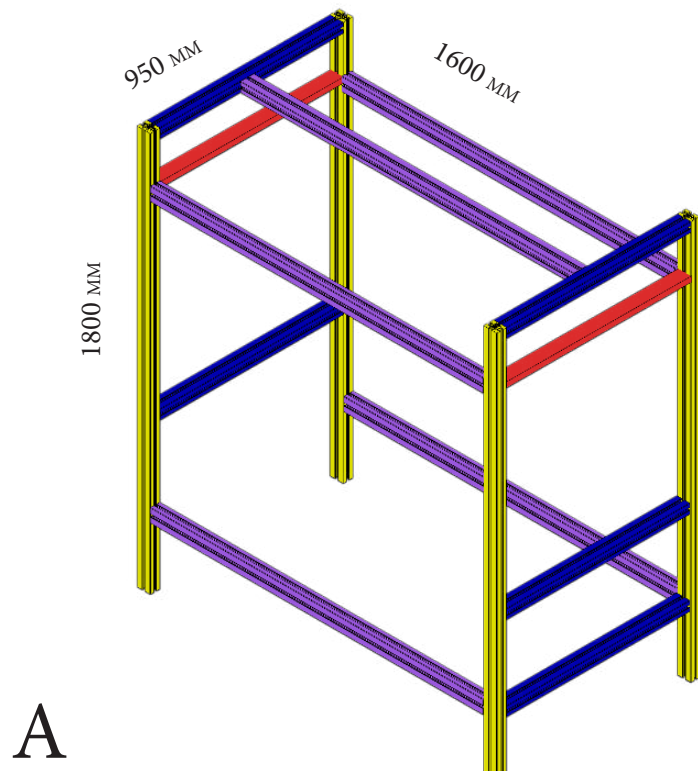
Ease of fastening : fast

Cost : Depend on the complexity

Volume : less volume.

Structure exploration - Main frame

Special X-profile - Aluminum



Structure exploration - Main frame Special X-profile - Aluminum

Availability: Not Easily available

Life & Chances of failure : The special X-profile section has very less chance of failure.

Strength : Very High strength

Replacement & repair : Doesn't need to replace or repair for around 6-7 years. If only in-cases of heavy impact replacement or repairing is required.

Maintenance & Cleaning(Bugs and insects): It is not easy to clean the surfaces, if the slot of sections are closed with an air tight cap bugs wont enter inside. Also it is not a friendly material to insects. Hard To clean compared to other sections.

Time: To make and assemble is comparatively high with other sections since this has very different section.

Complexity: Very Complex

Volume : consumes more volume than other sections

Weight : Very less weight

Workmanship : Does require highly skilled laborer.

Joinery

Complexity to make :More complex

Availability : Depends on the complexity

Workmanship : Normal level

Special tools might be required

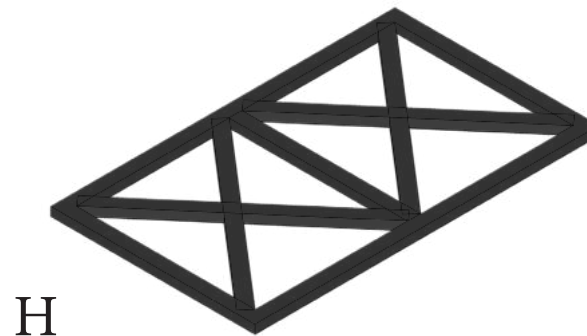
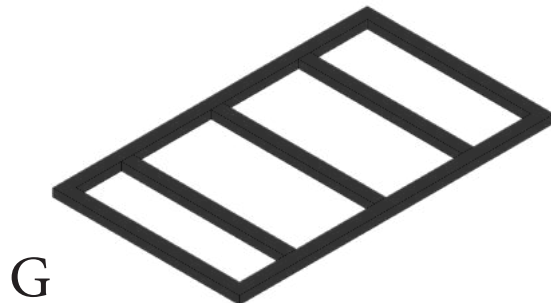
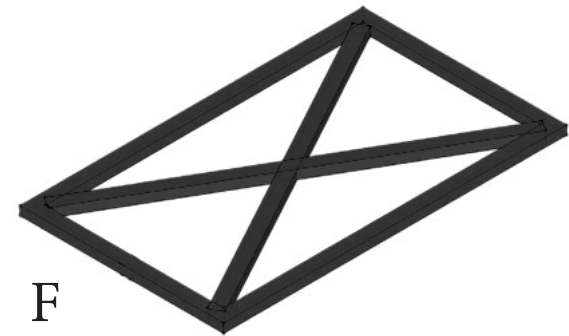
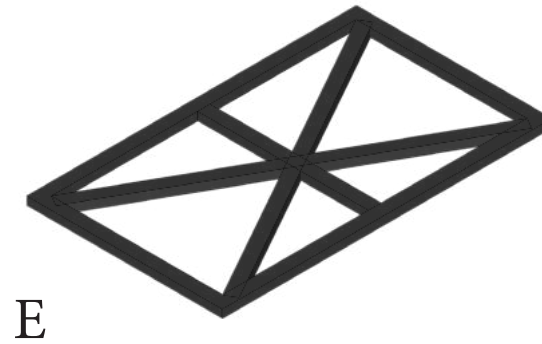
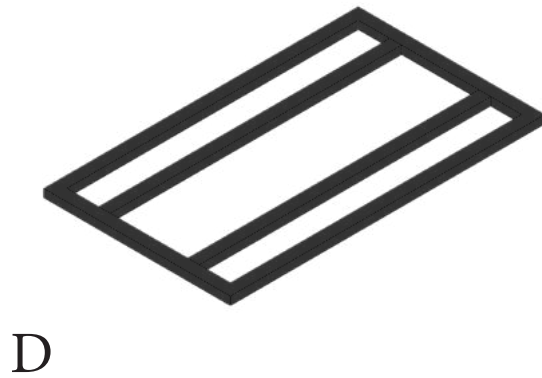
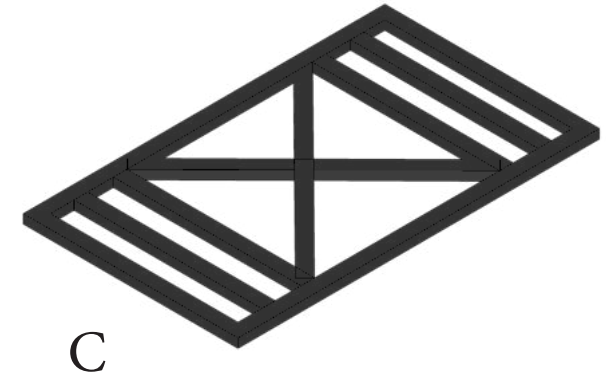
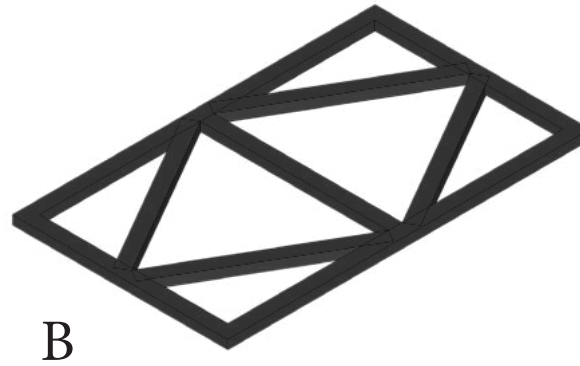
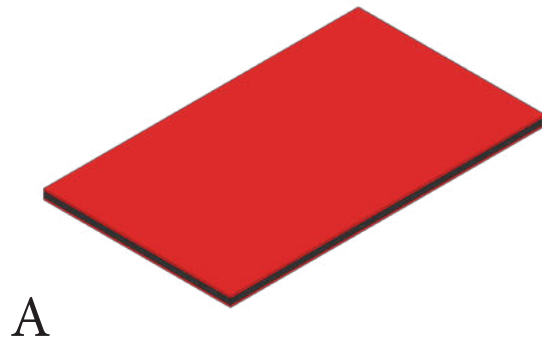
Strength : Good strength

Ease of fastening : fast

Cost : Depend on the complexity

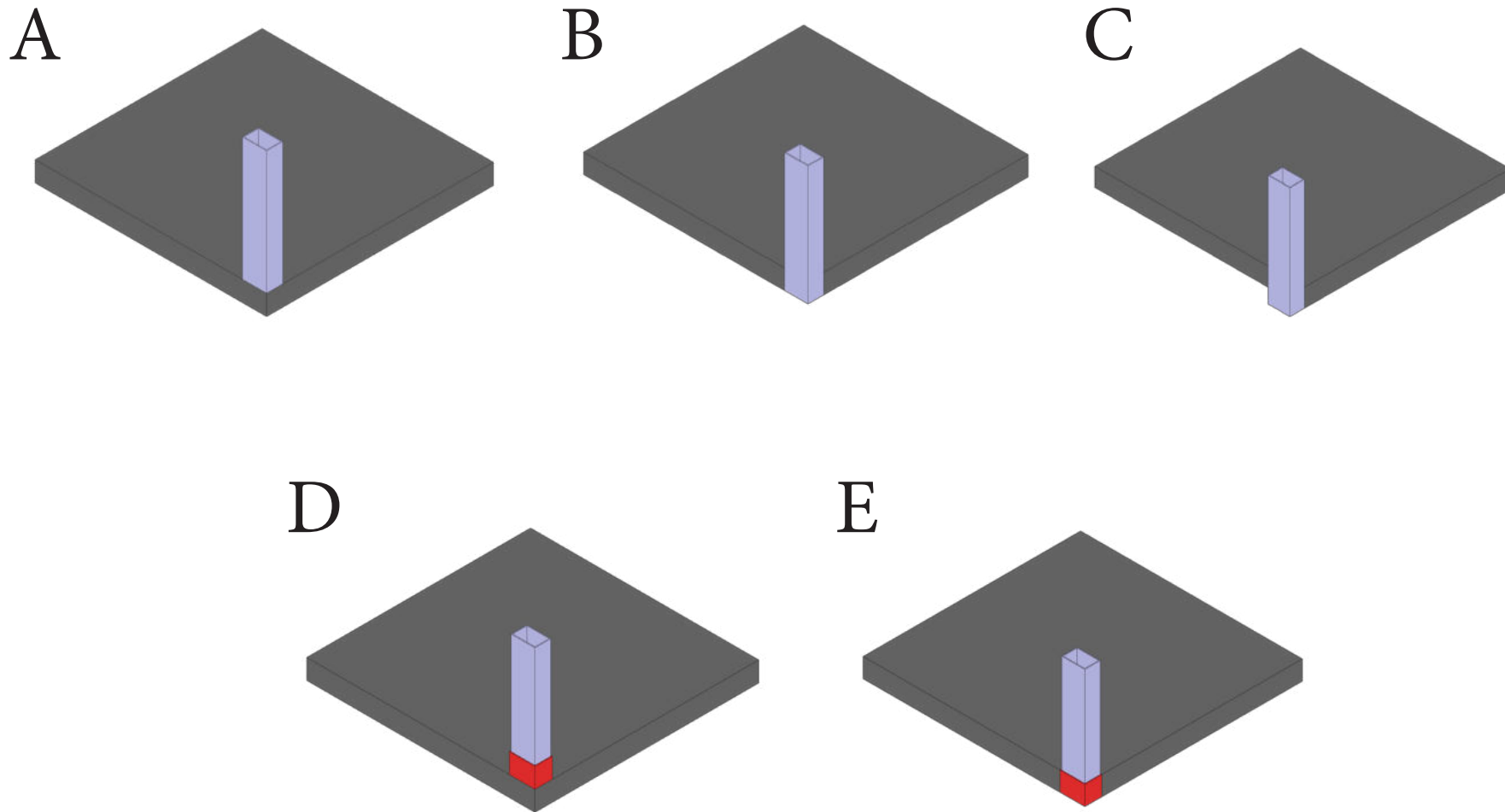
Volume : less volume if it internal joints

Base frame - Exploration



Type F configuration is selected for the base of the Kiosk

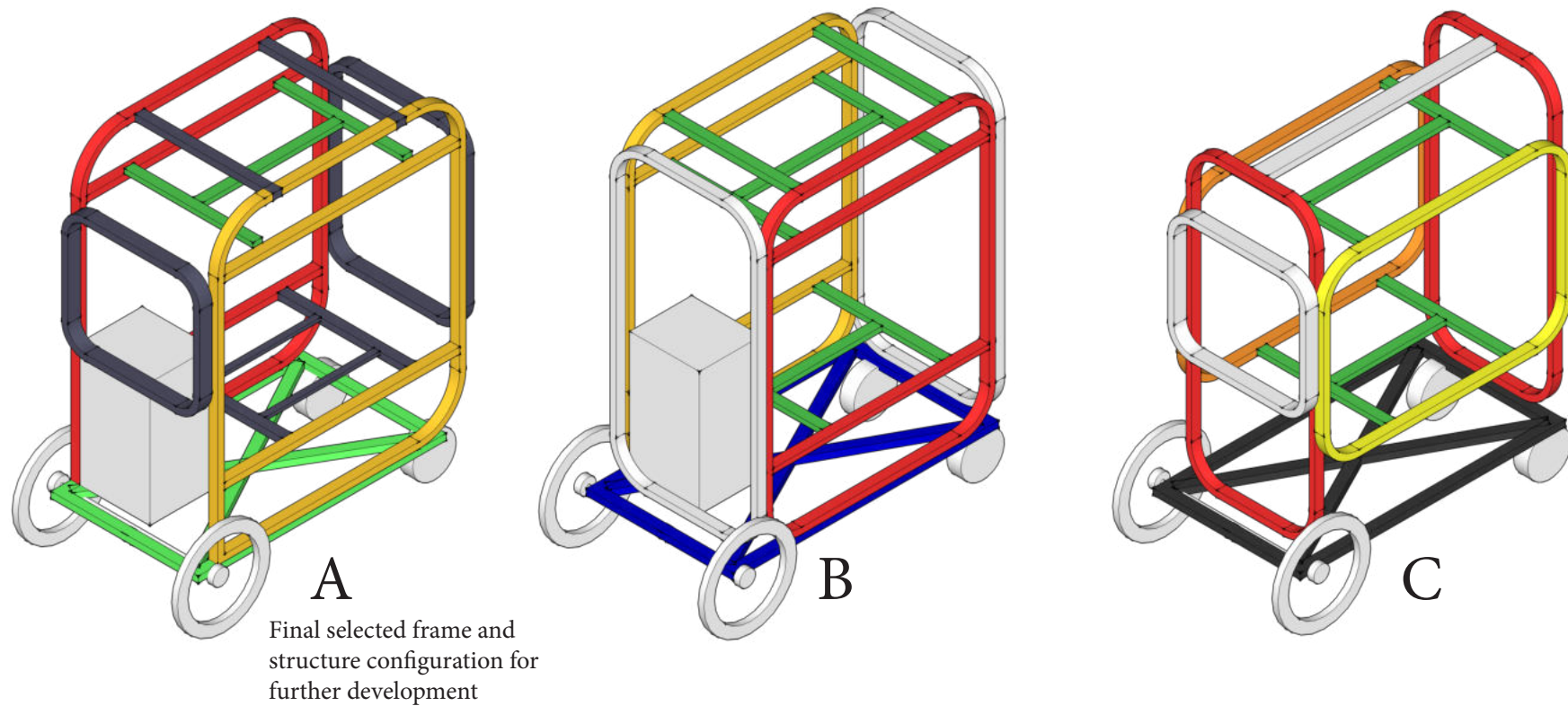
Base - main frame joinery details

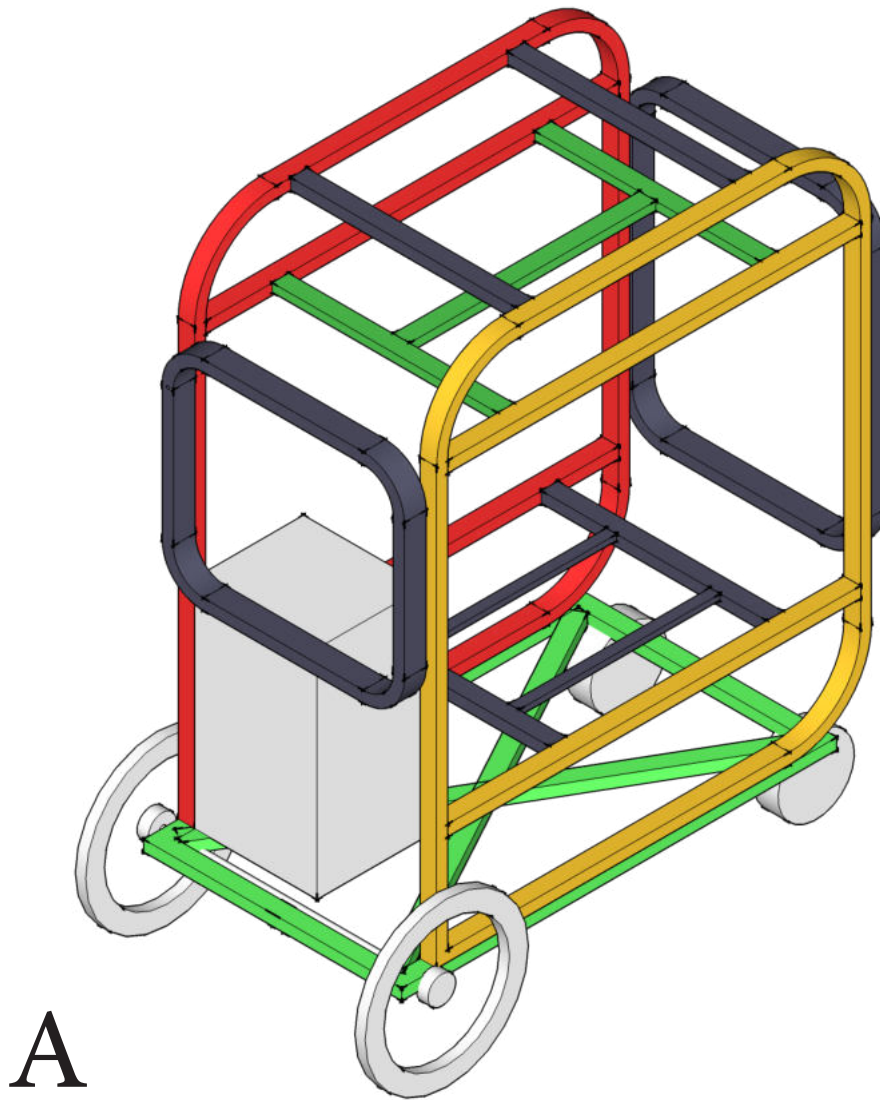


Type B is selected for the kind of joinery for the kiosk

After the analysis of exploration of structure using different sections, the box sections is selected for further concept. Bending technique with rectangular Box sections are used to reduce the time and complexity of work.

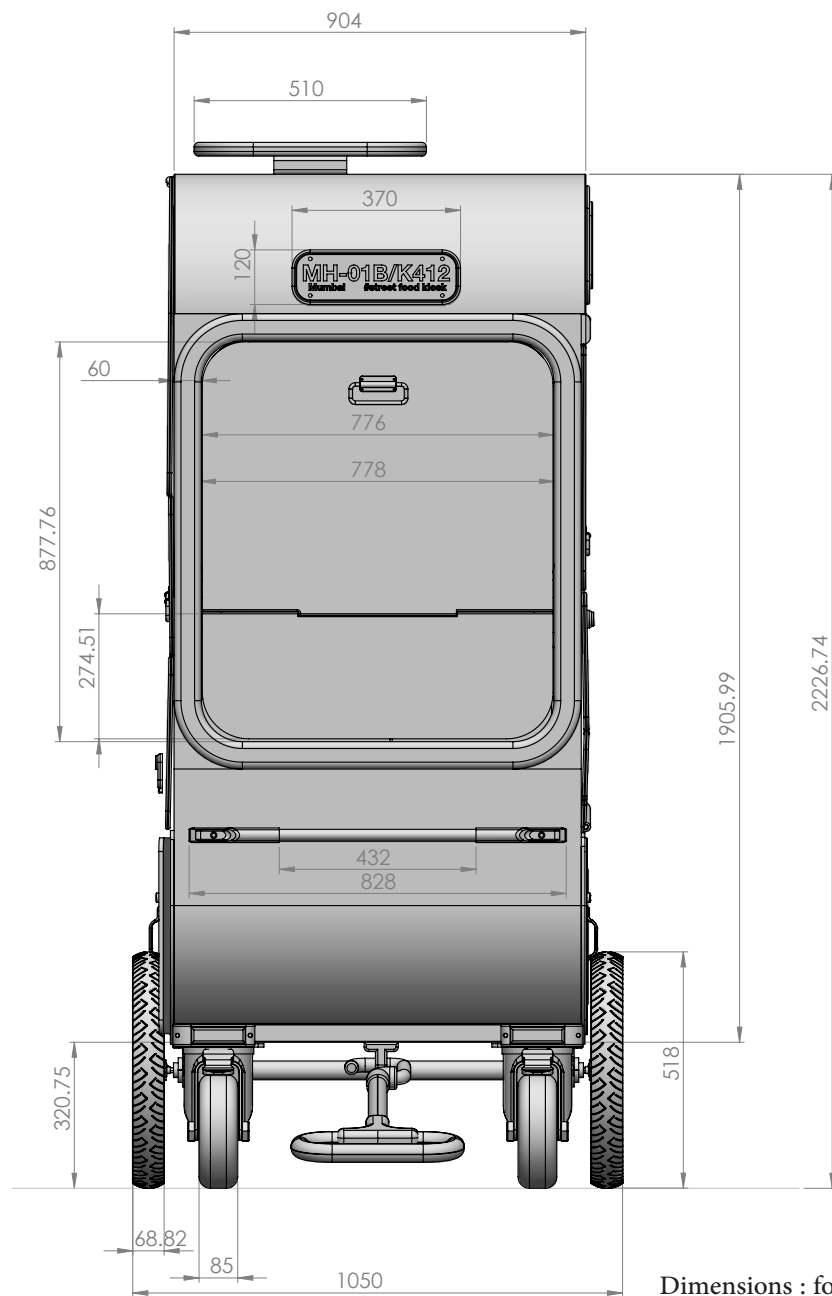
Exploration of structure for kiosk by using Rectangular section -Mild steel

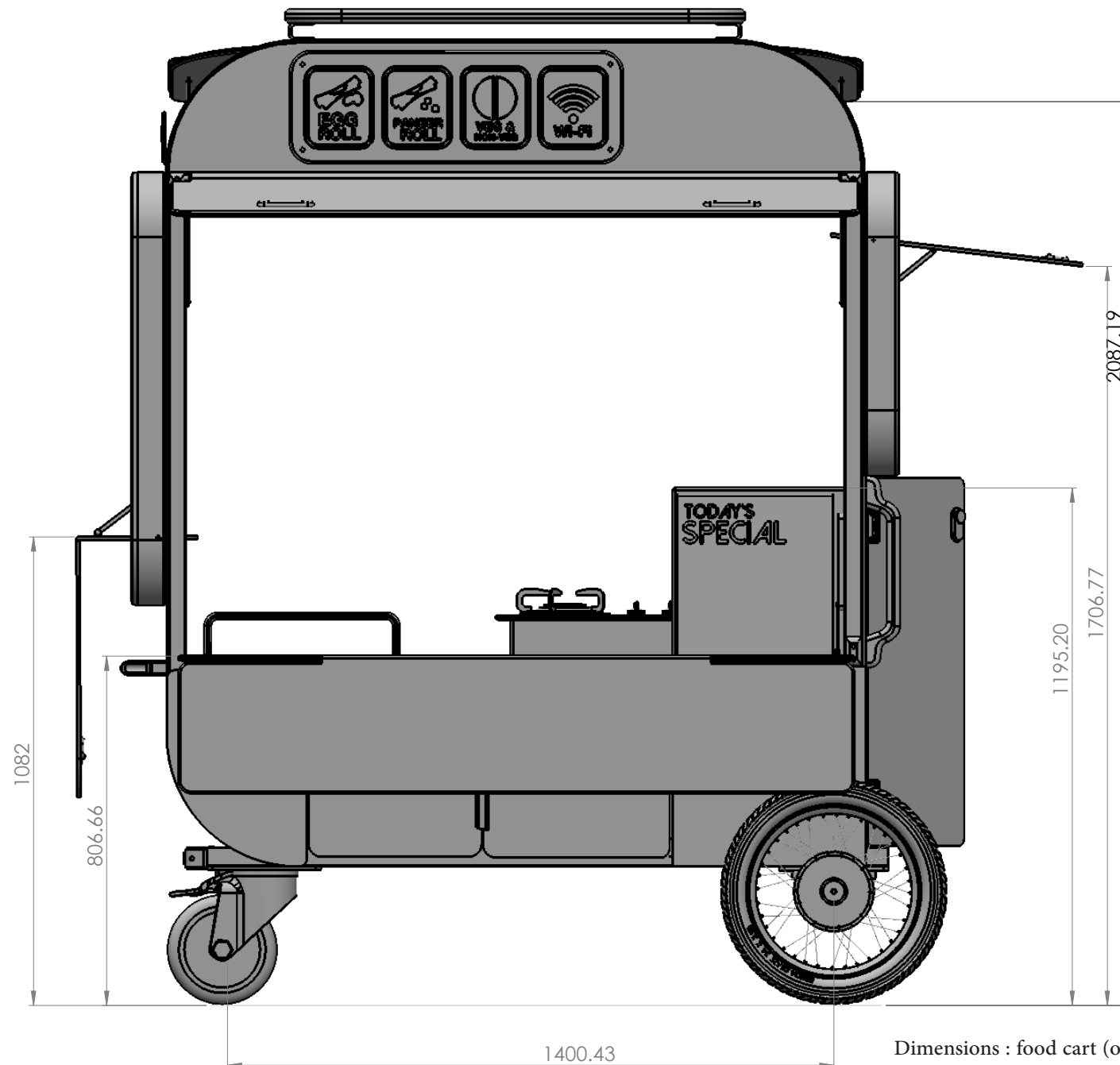




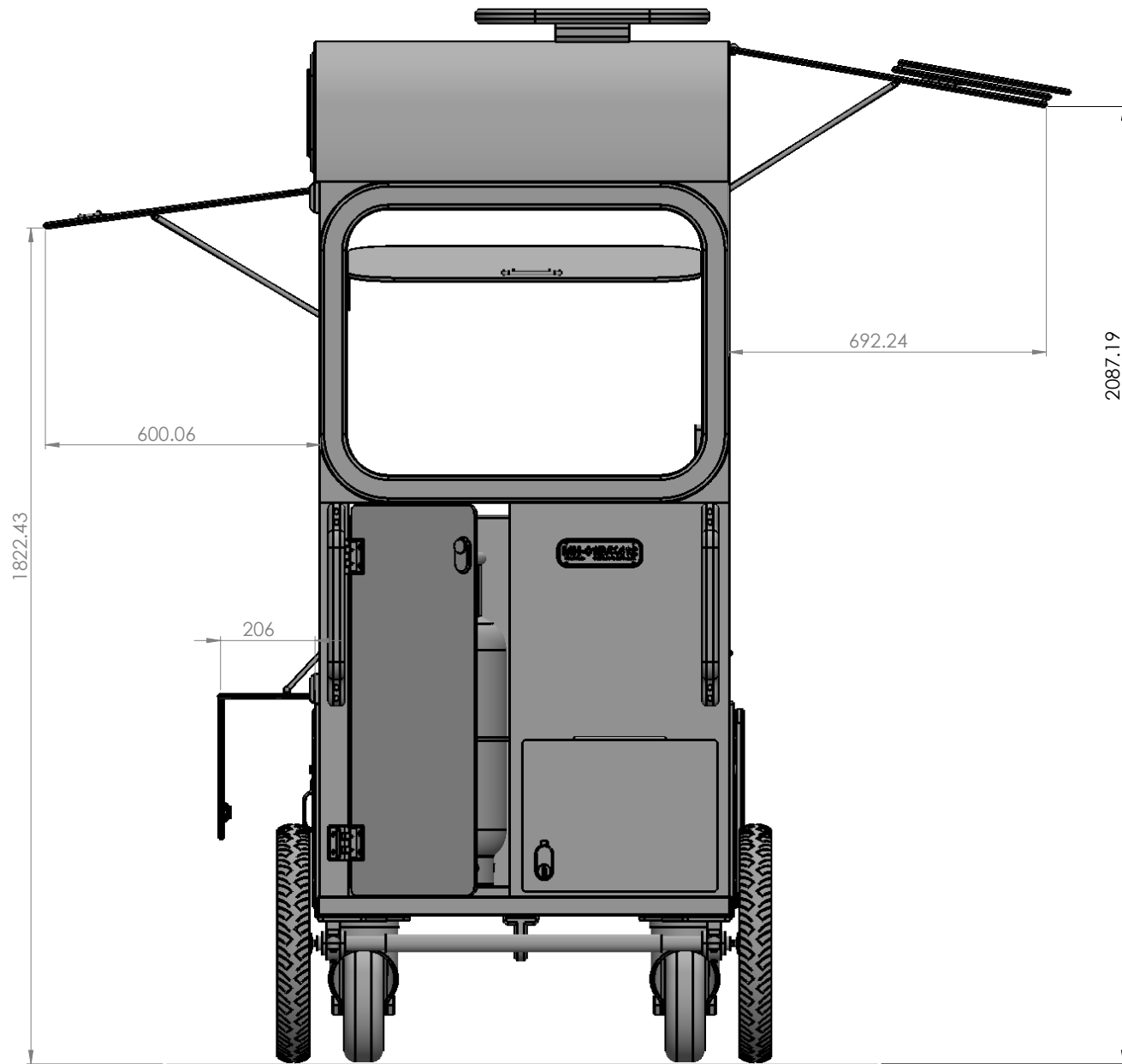
Different colours are used to denote that which all sections will be welded together. For example if you look at the yellow frame in the front it is welded using 3 pieces of Mild steel sections. One whole bend section and two intermediate sections.

The joinery will be done on-site using a welding kit by a trained person from the company. Initially nut and bolts were considered but later changed to on-site welding after analyzing the advantages and disadvantages of both types of connections.

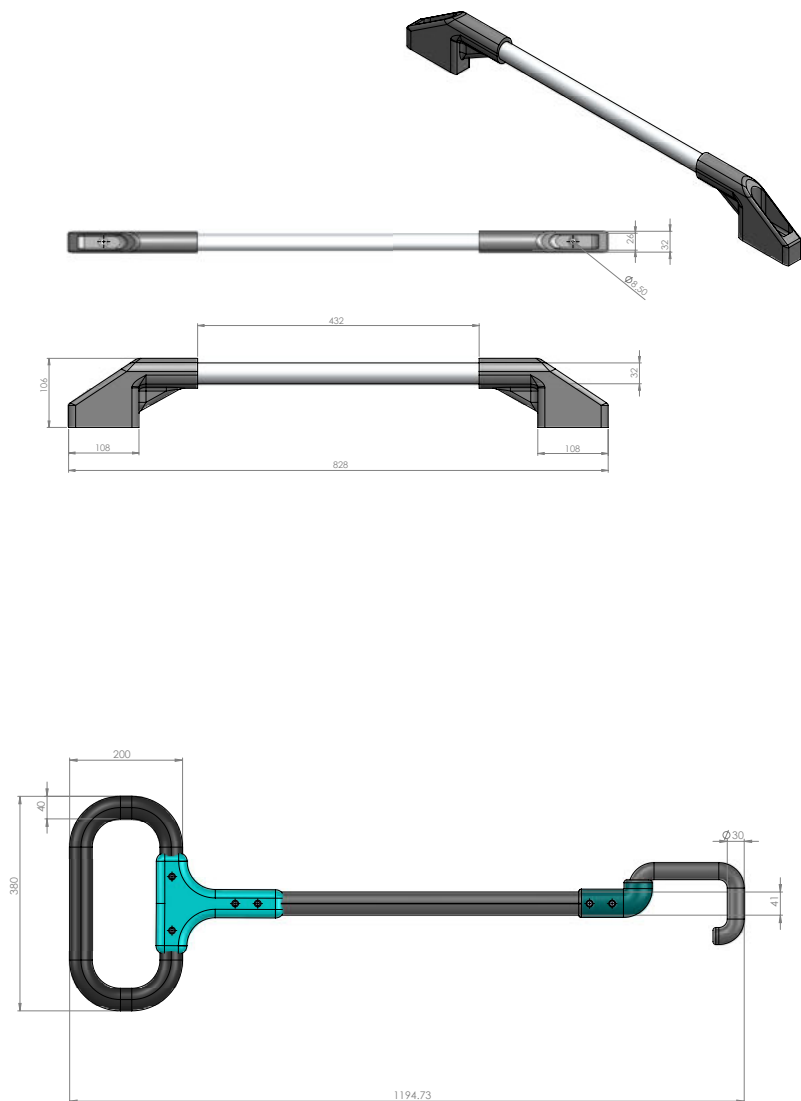




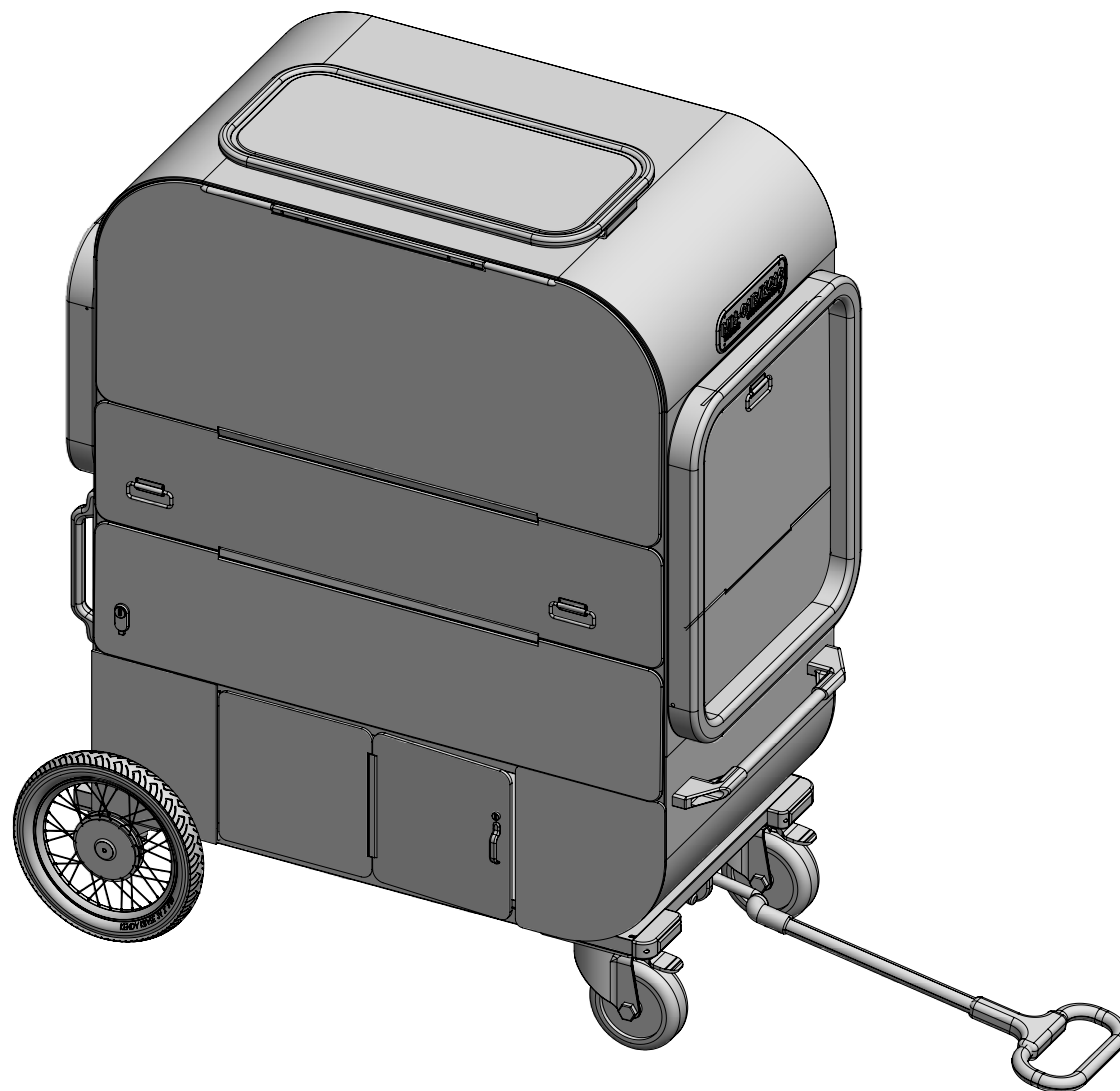
Dimensions : food cart (open) front view



Dimensions : food cart (open) side view



Dimensions : food cart (open) side view





CAD Renderings









CAD Renderings









Chapter 4

DELIVER

How?

Orders will be taken through website.

What?

Vendor can order the kiosk along with the products. The accessories will be optional. Either the vendor can buy along with the cart, in that case he will get discount. Thus company can also benefit by selling more.

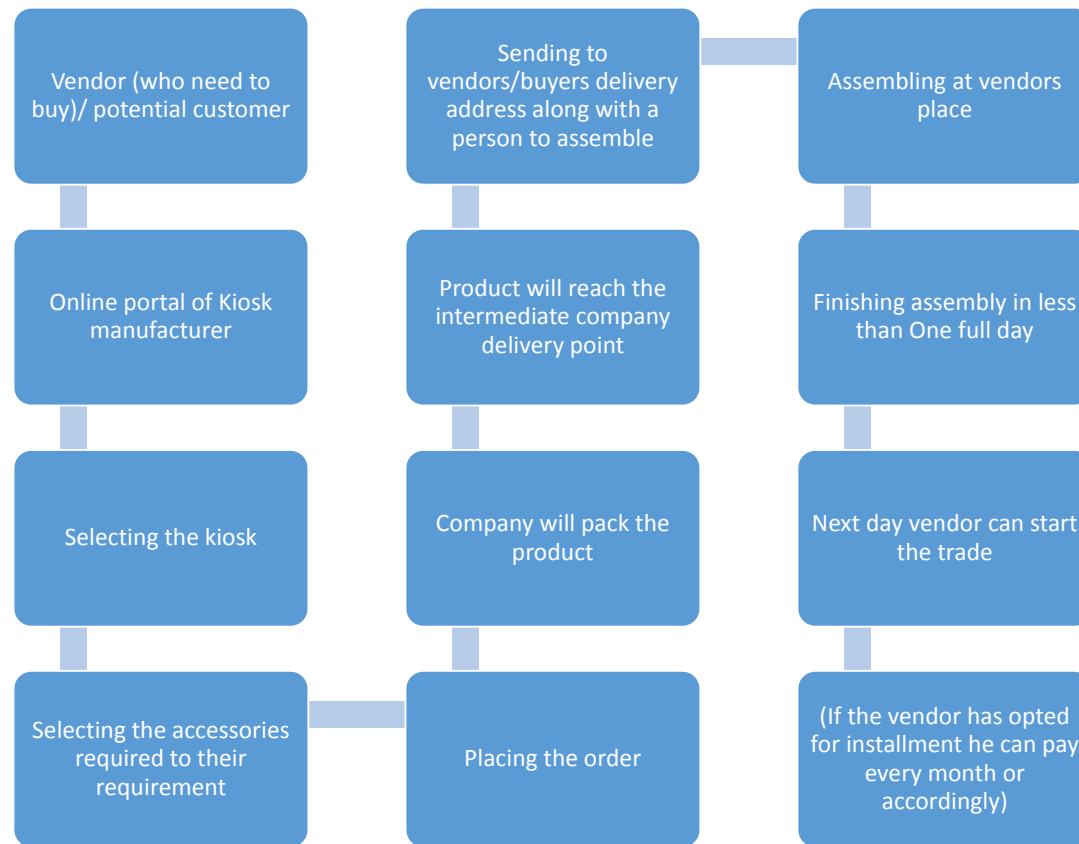
Why?

Online platform will enable the product to reach all the vendors all over india. Also it will be easy.

Product planning

One of the important aspect is product planning. The product planning involves finding out potential stakeholders and niches where the product can well reach. So that product will reach the intended user as designed and thought of. It will also helps the product to flourish and well develop,.

In the initial phase of development the company will have to release the Food kiosk in market, to vendors hands. First vendors will use the kiosk and after one year the company can go to government to start a plan to give subsidized Food kiosk. Through subsidized rates the company can reach the majority of vendors in India. The number of vendors in India is around more than 10-50 lakhs .Thus the kiosk can change the scenario in India.



The process of getting a kiosk

References

Font used : Minion pro

Softwares used for the project : Powerpoint, Microsoft word, Photoshop, Indesign, Mindmapping softwares, Solidworks, Rhino, Sketchup.

Product Details online kiosks:

1. http://www.alibaba.com/product-detail/Street-Food-Kiosk-Mobile-Food-Trailer_568117828.html?spm=a2700.7724858.13.6.Fz3oCi&s=p

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Thank you

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