

A close-up photograph of a hand holding a pair of red chopsticks, poised to pick up a dumpling from a bamboo steamer basket. The basket is filled with several white, pleated dumplings. The background is softly blurred, showing more of the steamer and some red flowers. The entire image has a semi-transparent dark overlay to make the white text stand out.

Graduation Project

Steam Cooking Device

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Abstract

Starting from a personal steam cooking device for an individual, the project went through a lot of refinement and upgrade at every stage of the process, and ended with a steam cooking device for esteemed fine dining establishments specializing in Asian cuisine. Though the device is made for an individual to enjoy the experience of cooking, the goal is to influence as many people as possible with the pleasing experience. It is a premium appliance that also caters to the needs of culinary experts to create new dishes.

Project pivoted a lot throughout the process as my understanding of the subject grew deeper. Learning through books, Ted talks, primary and secondary research, gave very valuable insights that I wanted to apply to my product. Bringing in the “design for senses” aspect brought in various new concepts to explore. The product achieved an organic form inspired from nature and yet is geometric.

Approval Form

This is to certify that the Industrial Design Project entitled " Steam Cooking Device" by Sagar D Dabherao is approved for Master of Design degree in Industrial Design.

Project Guide: Prof Avinash Shende



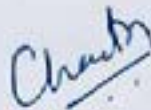
Signature of Chair Person



Signature of Internal Examiner



Signature of External Examiner



1. INTRODUCTION

Steam cooking has been a culinary technique utilized for centuries across various cultures, and in recent years, it has experienced a resurgence in popularity due to its numerous benefits. This gentle yet efficient method of cooking involves using steam to prepare food, preserving its natural flavors, textures, and nutrients. From professional kitchens to home cooking enthusiasts, steam cooking has become a go-to technique, offering a healthy and delicious way to create a wide range of dishes.

The project went through various phases. Starting from a cooking device for a working bachelor, it pivoted towards a steam cooking device for fine dining restaurants. As additional elements such as experience design, enhancing the experience of cooking, haptics, and serving the 5 senses were added through the process, the project got more and more enriched. This led to the design of a steam cooking device for a fine dine restaurant that is exhibited as a live cooking experience to the customers.



1.1 Understanding the context

Steam cooking

The fundamental principle of steam cooking lies in the use of moist heat to gently cook food. By heating water to its boiling point, steam is generated, creating a controlled cooking environment. As the steam surrounds the food, it transfers heat energy, cooking it evenly and efficiently. This process allows ingredients to retain their natural flavors, colors, and textures, resulting in vibrant and enticing dishes that tantalize the senses.

Cooking food with steam maintains the nutritional value of ingredients. Unlike other cooking methods that may require additional fats or oils, steam cooking minimizes the need for added fats, making it a healthier option. The gentle nature of steam cooking helps to preserve essential vitamins, minerals, and antioxidants that can be lost in other cooking techniques. This makes steam cooking particularly appealing to those seeking a balanced diet without compromising on taste or nutritional benefits.



In addition to its health advantages, steam cooking offers versatility in the kitchen. It is suitable for a wide variety of ingredients, including vegetables, seafood, poultry, grains, and more. Steam cooking allows for precise control over the cooking process, making it possible to achieve different textures and degrees of doneness. From tender and delicate seafood to perfectly cooked grains and vegetables with a crisp bite, steam cooking opens up a realm of culinary possibilities.

Today, steam cooking has gained attention as a sustainable and eco-friendly cooking method. By utilizing steam, it reduces the reliance on excessive amounts of water and energy that are often required for traditional boiling or simmering techniques. The efficiency of steam cooking contributes to a more sustainable approach to food preparation, aligning with the growing awareness of environmental concerns within the culinary world.

Steamed Food

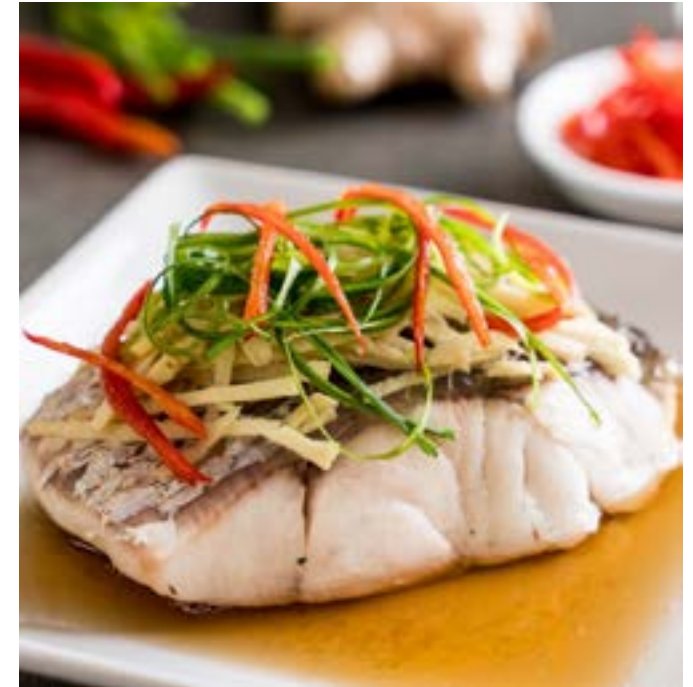
Steamed Vegetables



Steamed Vegetables: Steaming vegetables is a common and simple method of cooking. It involves placing vegetables in a steamer basket or a steaming tray and allowing the steam to cook them. This method helps retain the vegetables' natural color, texture, and nutrients.

Commonly steamed vegetables include broccoli, carrots, cauliflower, asparagus, and Brussels sprouts.

Steamed Seafood



Steamed Seafood: Steaming is a popular technique for cooking various types of seafood. It helps preserve the delicate texture and flavors of fish, shrimp, crab, and other seafood. Steamed seafood is often seasoned with herbs, spices, or soy-based sauces to enhance its taste.

Examples include steamed fish fillets, steamed shrimp with garlic, and steamed crab legs.

Steamed Dumplings



Steamed Dumplings: Steamed dumplings are a staple in many cuisines, particularly in Chinese and Asian cuisines. These bite-sized parcels of filling enclosed in a thin dough wrapper are steamed until cooked. The fillings can consist of meat, vegetables, seafood, or a combination.

Common types of steamed dumplings include Chinese dim sum such as shrimp dumplings (har gow), pork dumplings (siu mai), and vegetarian dumplings.

Steamed Buns



Steamed buns, also known as baozi or mantou, are a type of bread-like food that is steamed rather than baked or fried. They have a soft and fluffy texture and can be filled with various ingredients such as pork, chicken, vegetables, or sweet fillings like red bean paste.

Steamed buns are popular in Chinese, Taiwanese, and other East Asian cuisines.

Steamed Rice and Rice Noodles



Steamed rice is a staple in many Asian cuisines. It involves cooking rice by steaming it over boiling water until it becomes fluffy and tender. Similarly, rice noodles can be steamed to achieve a soft and translucent texture, often used in dishes like steamed rice noodle rolls or in soups.

Steamed Desserts



Steaming can also be used to create delicious and healthy desserts. Some examples include steamed puddings, sponge cakes, custards, and rice-based desserts like Thai sticky rice with mango or Chinese glutinous rice balls.



User context

After conducting extensive research and analysis to identify the target users for steam cooking, it was determined that working bachelors would be the primary user persona.

1. Lifestyle and Time Constraints: Working bachelors often lead busy lifestyles, with long working hours and limited time for cooking elaborate meals. Steam cooking offers a convenient and time-efficient method of preparing meals, as it requires minimal preparation and cooking time.

2. Health-consciousness: Many working bachelors prioritize their health and well-being. Steam cooking is a healthier cooking method compared to traditional methods like frying or sautéing, as it retains the nutrients, flavors, and textures of the ingredients without the need for excessive oil or fat. This aligns with the health-conscious mindset of working bachelors.

3. Ease of Use: Working bachelors typically prefer cooking methods that are simple and easy to master, as they may not have extensive culinary skills or experience. Steam cooking is relatively uncomplicated, involving minimal steps and a reduced risk of burning or overcooking food. It offers an accessible option for individuals who are new to cooking or have limited cooking facilities.





4. Versatility and Variety: Steam cooking provides a wide range of options for cooking various types of food, including vegetables, fish, poultry, grains, and even desserts. This versatility allows working bachelors to experiment with different recipes and enjoy a diverse range of healthy meals without getting bored of repetitive cooking routines.

5. Cost-effectiveness: Steam cooking can be cost-effective for working bachelors, as it requires minimal equipment and ingredients. Steamers or steam-cooking appliances are generally affordable, and steam-cooked meals often use simple, readily available ingredients, which can help working bachelors save money on their grocery bills.

6. Sustainability: Steam cooking is an environmentally friendly cooking method, as it consumes less energy compared to other methods. This aspect may resonate with working bachelors who are conscious of reducing their carbon footprint and adopting sustainable practices.

Considering these factors, working bachelors emerged as the primary user persona for steam cooking due to their time constraints, health-consciousness, preference for simplicity, desire for variety, cost considerations, and sustainability awareness. By focusing on meeting the needs and preferences of this user group, steam cooking solutions can effectively cater to the target audience and provide them with convenient and healthy meal options.

2. RESEARCH

2.1 Secondary Research

I started by understanding the relation between a user and product. We are able to instantly form connection with a product, later I realized, is because of the memories or emotions it triggers. We are able to associate some feelings with the product and that is what makes it a good design. I was advised by guide to read “Designing Design” by Kenya Hara, to understand this relation better.

“Designing Design” by Kenya Hara is a book that explores various aspects of design and the philosophy behind it. One of the chapters in the book is dedicated to haptics, which focuses on the sense of touch in design.

In this chapter, Hara emphasizes the importance of tactile experiences in design and how they can deeply impact our perception and interaction with objects. He says we gather information through senses and a good quality of information becomes a memorable experience. He believes that touch plays a crucial role in creating meaningful and memorable design experiences. Hara argues that while visual aesthetics are essential, they are often prioritized over other senses, particularly touch, which can result in a less holistic design approach.





Hara discusses how the texture, weight, temperature, and other tactile qualities of objects can evoke emotional responses and enhance the overall user experience. He believes that by incorporating natural forms, textures, and tactile elements into design, designers can create a stronger connection between the object and the user, fostering a deeper level of engagement and satisfaction.

He says our senses are “information receptors” so we give different information to these receptors at each experience.

That led to thinking, what kind of information can be given to the senses while steam cooking? How can I trigger memories of the user through my product?



Geta

Traditional Japanese raised wooden sandals that are worn barefoot. Shuhei Hasado is a superb plasterer who has taken the championship at the World Skills Competition. His participation in the HAPTIC project was covering the surfaces of several pair of geta. The texture covered geta emphasize more on the amazing sensitivity that lies dormant in the soles of our feet. We used to walk barefoot before wearing shoes. The sole of the foot acted as an interface with the ground, we picked up great variety of information from the ground.



Juice Skin

Product designer, Naoto Fukasawa designed the packaging for the fruit juice. He focused on stimulating memories of the recipient by mimicking the textures of the fruits on the packaging. The gentle angles of the packaging reveal something in common with the feeling of holding a banana. The stem added to the packaging completes the image of the banana.



Gel Remote Control

Electrical appliance manufacturer Panasonic Design Company proposed a remote control that when switched off droops as if it were dead. But when switched on, it comes to life. He begins to breathe and stiffen. The design focused on the way it feels to touch, rather than appealing form, button layout or logo placement.



Cabbage Bowls

Artist Yasuhiro Suzuki made cabbages out of paper. The shapes were accurately created by molding real cabbage leaves out of silicone, then reproducing in paperclay. Holding a paper cabbage bowl in a party has a very different haptic experience. The form of this design is very much appealing that triggers memories, and of course the feel of holding these bowls gives pleasure to human mind as it likes complex things like these, which carry a plethora of information.

Market Study

SHEFFIELD CLASSIC 3-In-1



This multi-cooker serves three purposes in one appliance – **boiling, grilling, and frying**. The strong aluminum body, ergonomic design, and user-friendly operation are some of the positive attributes of this multi-cooker.

Features

- a temperature control knob that can be adjusted depending on the requirements
- superior heat retention
- Multifunctionality: 3-in-1 multicooker can Boil, Grill, as well as Fry
- Temperature control: The device provides multiple temperature control options such as “Keep warm”, and 4 levels

Wipro Vesta



It is a 4-in-1 multi cooker from Wipro featuring a power of 360 watts. This device can steam veggies, boil eggs and even reheat steamed food. The device comes with two different levels that allow for cooking two dishes simultaneously.

Features

- Four in one multicooker
- Concurrent cooking functionality
- Non stick stainless flat heating plate
- One touch cooking: auto cut off once the cooking is done
- Stepless auto temperature regulation
- Boil dry protection that cuts off the supply once the water is finished
- An indicator light to show operation

Prestige PMC



Equipped with 600 watts of power, this multi cooker features a 360-degree swivel base. Designed to serve multiple purposes, it is a valuable addition to any kitchen.

Features

- Variable temperature control
- Ergonomic handle
- Glass lid that eases the cooking process
- Concealed element at the bottom makes the cleaning and maintenance easy

Butterfly Wave



This multi cooker from Butterfly can hold a capacity of 1.5 liters. It offers multiple functions that could be done using this multi cooker – prepare hot water, instant tea, noodles, pasta and boiling eggs.

Features

- a temperature control knob that can be adjusted depending on the requirements
- ergonomically designed handle
- easy to carry, compact and supports an automatic cut-off function
- glass lid that provides clear visibility of the contents being cooked.

Brayden Kooko Alor Multi Cooker



Brayden's multi cooker supports two heating modes. The handle is well designed and offers a comfortable grip. It can boil water, milk or egg, steam vegetables or momos, cook soups, noodles, pasta, or rice easily.

Features

- It is a multi cooker and a smart kettle
- Made with food grade 304 stainless steel
- 1.8 L Capacity
- Transparent toughened glass lid
- Cool touch handle
- Non-slippery sturdy feet

KENT Smart Multi Cooker



This single appliance can make idlis, boil eggs, steam momos and prepare tea. KENT Multi-Cooker is a smart and efficient kitchen appliance for cooking, steaming, and boiling.

Features

- Multi-cooking feature to make idlis, boil eggs, steam veggies or momos, or masala tea.
- 800W high-performance ensures instant results.
- Stainless steel inner pot and transparent glass lid.
- Cool-touch handle and auto shut-off feature offer safety and convenience
- Features Swivel Power Base for added convenience.
- Better response to temperature change to minimize cooking time,
- Easy-to-store compact design.

Glen 3 in 1 Electric Multi Cooker



Glen's multi cooker features 3-in-1 functionality. It features two different levels ideal for preparing eggs, vegetables, and meats in one go.

Features

- Non-stick heating plate
- Timer control knob helps set time for boiling, steaming, and cooking
- 350W power to boil & steam foods quickly
- Boil dry protection that cuts off the supply once the water is finished

Cello 100 A Multi Utility Cooker



With a small and highly portable design, it comes with a capacity of 1.2 liters and a soft-to-touch handle.

Features

- High-class 304 stainless steel body
- Wide mouth opening
- Removable steamer bowl, and steamer stand

Jivima Electric Multi Cooker Kettle



It is a multi cooker that operates without any gas and utensils. This cooker is ideal for preparing everyday dishes be it dal, rice, curries, chicken, or soups.

Features

- Non-Stick base & Anti-Hot Outer body and One Button Operation
- Wide mouth opening
- Steamer attachment
- Quick heating

Product Study

Alessi

I studied some of the products made by Alessi in Barware, Kitchenware, and Tableware. Designers had very subtly added poetry to kitchen utensils. Incorporating philosophies, symbolizing cultures, creating interest through visuals as well as sound, every product has its own unique story. I learnt how daily use utensils can be playfully made to create joy and enhance the overall experience.







KETTLE: By Richard Sapper

The 9091 kettle has a melodic whistle made of brass in a shape that has never been seen before and consisting of two small vents in which the tuners that reproduce the notes mi and si are inserted. Richard Sapper created this kettle inspired by a childhood remembrance, the poetic sound of boats' sirens at River Rhine: this is because the melody that accompanies the vapour outlet must be pleasant and not anxious like the whistle of boilers. This induction kettle is a polysensory object which will not interrupt an enjoyable break with a whistle, but with a captivating melody.

9093 Kettle: By Michael Graves

One of the Alessi products with the highest global sales is the 9093 kettle with the bird-shaped whistle. Michael Graves designed this kettle in 1985, drawing inspiration from pre-Columbian cultures, American pop culture, and European art. Graves's unique visual language is the reason behind the extraordinary success that the kettle has had since the year of its production. It is a clever, elegant piece that is also amusing and enjoyable. When the water begins to boil, the bird sings, which invariably causes a smile.





Pito: Kettle by Frank Gehry

Pito is a stainless steel kettle designed by Frank Gehry. The melodic top and the handle in mahogany have the stylized shape of two darting fishes. The melody produced by the whistle is likewise peculiar, it sounds like a whale's song. Gehry turned a kitchen utensil into a fascinating poetic object.

Bulbul: Kettle by Achille Castiglioni

Bulbul is a perfect induction hob kettle imagined in the rounded shape of a curling stone: it presents a new way of handling this object, almost as if to suggest an invitation to play by sliding it across the kitchen surface. Bulbul reveals Achille Castiglioni's extraordinary ability to transfer qualities and functions into a project from objects belonging to entirely different spheres. This game of transfers has often resulted in the equally famous ironic dimension of many of his works.



Shaze

“Our designs are thoughtfully crafted, exhibiting algorithmic precision and captivating variety.”

Shaze is a renowned brand known for its distinctive design language and exceptional craftsmanship. Their design philosophy revolves around creating products that seamlessly blend elegance, functionality, and innovation. Shaze’s aesthetic appeal lies in its contemporary and sleek designs, featuring clean lines and a harmonious balance of form and function. Whether it’s their jewelry, home decor items, or personal accessories, Shaze products exude sophistication and style. The brand’s attention to detail is evident in the meticulous finishing and use of premium materials. Shaze’s design language consistently pushes boundaries, creating unique and statement-making pieces that effortlessly elevate any space or outfit.

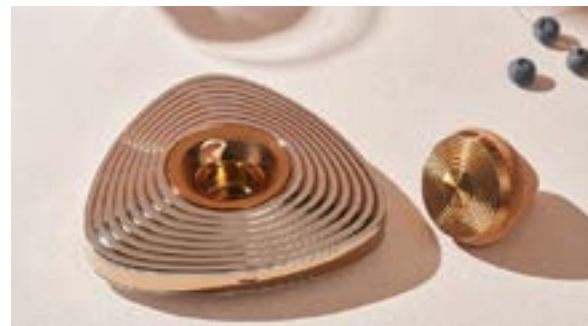






The Alchemist

The ergonomically designed decanter allows for a steady flow while appearing to float atop the base when resting. The intricate gloss zamac topping with its cork stopper contrasts with the transparency of the form and spirit within. The tricoid base is made of heavy-duty steel. With a weight of nearly four kilos, this contributes to the decanter's deceptively weightless standing without the risk of tipping, dragging, or breaking. The rippling, casted Zamac base is electroplated to generate the swoon-worthy two-tone effect, which adds to the piece's understated flamboyance.



The Cage

The decanter's dramatic outlines are formed from hand-blown, lead-free crystal glass. The robust fins keep whisky from straying are the only thing holding the distinctive conical base together. A cork stopper fits neatly into the neck, and the metal finish on top of it enhances the contrast with the clear glass. The weight-balance system enables the decanter to enter and exit the cage in simultaneous motion. The robust aluminium base and fins are built for futuristic appeal with their anodized gold finish. We've achieved the perfect balance of smooth edges and riveting curves.



Sensory Theory by Laird

The sensory theory suggests that “Effective learning takes place when all the senses are stimulated. Laird (1985) stated that for learning to occur the five senses of sight, hearing, touch, smell and taste need to be stimulated. The theory suggests that if multi-senses are stimulated there is a greater chance of learning to take place. Therefore, it is suggested to adapt your approaches and resources to the use of as many senses as possible for learners to relate to the concept being discussed in a learning environment”.

In his theory Laird quotes research that found out about the majority of our knowledge that is being held by adults; 75% is learned through seeing. Followed by hearing which is effective 13% of the time and later by other senses including touch, smell and taste which accounts for 12% of the time. Learning can be enhanced through stimulation of senses, most importantly the visual sense. The use of stimulations through visuals, colour, sound and the use of other techniques provides the learners with a sensory learning experience that is more engaging, easy to remember and recall.

In a Ted Talk “Design for All 5 Senses” by Jinsop Lee, he evaluates different experiences in his life from the point of view of 5 senses. And then applies this 5 senses theory to design products. Even heightening one of the senses can result in a successful product.

I took inspiration from this theory and started ideations focusing on each of the senses, enhancing the experience through multi-sensory stimulus.

My investigation into different forms underwent a shift when I began considering the product’s connection to the senses. This shift led me to concentrate on enhancing experiential aspects, ultimately shifting the target of my product from working bachelor towards a high-end dining establishment. I came to the realization that a fine dining restaurant would provide an ideal setting for my product, allowing patrons to engage with it while enjoying the immersive experience of witnessing their food being prepared in front of them.





Michelin star restaurants

A Michelin Star is awarded to restaurants offering outstanding cooking. Five universal criteria are taken into account: the quality of the ingredients, the harmony of flavors, the mastery of techniques, the expression of the chef's personality through their cuisine, and, equally importantly, consistency across the entire menu and over time.

Scenario

Asian fine dining restaurants offer a captivating and culturally rich dining experience. These establishments meticulously blend exquisite flavors, artistic presentation, and impeccable service to create a memorable culinary journey. Asian cuisine, renowned for its diverse regional variations, is showcased in these restaurants through carefully curated menus featuring dishes that exemplify the mastery of culinary techniques and the use of premium ingredients. From traditional delicacies to innovative fusion creations, Asian fine dining establishments strive to provide an elevated and immersive experience for patrons, where attention is paid not only to the flavors but also to the aesthetics and ambiance. With a focus on creating a harmonious balance between taste, texture, and visual appeal, Asian fine dining restaurants invite guests to embark on a gastronomic adventure that celebrates the rich culinary heritage of the continent.

Flavours in Food

Flavour is a sensory phenomenon which is a combination of the sensations of taste, odour or aroma, heat and cold, and texture or “mouthfeel”. The appearance of food is important, but it is the flavor that ultimately determines its quality and acceptability. Natural flavouring materials such as spices, essential oils and fruit juices have been used for long in food preparations but as their supply has not kept up with the demand, with a consequent rise in their cost, natural flavouring agents have been largely substituted by synthetic ones. Thousands of these synthetic compounds are now being used as food additives. There are four basic tastes: salty, sweet, sour and bitter.

The flavor of any food depends upon minute quantities of 100 or more chemicals that are present in food. These flavoring components are present in concentrations ranging from a few ppm to 0.1 percent.

Classification of flavours:

- Natural Flavours: Herbs, Spices, Aromatic seeds, Fruits, Vegetables
- Processed flavours: Fermented, Baked, Toasted, Roasted, Cara-melized
- Added flavours: These are two types:



Natural Flavours

- They are usually extremely complex mixtures of many different substances. Sometimes the flavour of natural flavouring agent may depend upon a single substance. Eg:- Clove oil flavour is because of chemical eugenol. It contributes 85% of clove oil.
- Or it may be present in extremely small amounts such as citral in oil of lemon which constitutes 5% of the oil.
- Natural flavouring agents are compound of mainly aromatic organic compounds present as volatile essential oils or as non-volatile constituents. Such as resins and oleoresins. They are formed in the plant during normal plant metabolism and remains as such the plant is harvested.
- The aroma of onion, garlic, cabbage is mainly due to Sulphur-containing compounds.
- The flavour and aroma of fruits and vegetables are because of the presence of volatile organic chemicals such as esters, aldehydes, acids, alcohols, ketones and ether present as essential oils in natural foods.

Processed Flavour

- The flavour that develops during processing by decompositions, the combination with other compounds, or formation of a new compound.
- The following flavours form during processing of various foods.
- Flavour due to enzyme action
Vegetable cuts (onions, garlic)..... Odour is because of formation of diallyl disulfide.
- Flavour formed during cooking and other heat processing.
Eg:- cooked meat flavour, aroma of freshly baked bread or roasted Coffee beans
- Undesirable flavours caused oxidation eg: rancidity of oil.

Added Flavour

- Natural flavour or synthetic flavours are often added to food to increase its acceptability.
- Role of added flavours has gained importance with advancement in technology being used in food industry and development of new products such as bakery and confectionary items, ready to eat foods, beverage and fast food items.
- The flavour which is lost during cooking and processing can be replaced by either of the following methods
 - Adding natural flavourings and extracts:- Eg:- Natural essence from fruits, essential oils extracted from spices, Vanilla essence is prepared by extracting the essential oil from vanilla pod with the channel.
 - Adding synthetic flavours that consist of a blend of chemical which smells like the original substances
Eg:- Vanillin is the synthetic flavour instead of vanilla
- Synthetic chemicals are blended to match a natural flavour.
- Other substances which contribute towards the flavour of food are sweeteners and flavour enhancers

Some plant produce flavours:

- Herbs: Basil, Parsley, celery, thyme, mint, etc.
- Fruits: Orange, lemon, apple, banana, strawberry, Pineapple, etc.
- Spices: Cardamon, clove, turmeric, peppercorns, etc.
- Vegetables: Mushrooms, corn, peas, onion, garlic, cabbage, turnips, etc.
- Aromatic seeds: Aniseed, cumin, fennel, dill, caraway, etc.

The aroma of onion, garlic, cabbage, etc. is mainly due to sulphur – containing compounds. These vegetables should not be overcooked. Other flavouring components in vegetables are methanol, acetone, propanal, etc.



Liquid spice essence can be added to steaming water to flavour the food as well as to give an aromatic experience. Patrons can choose the essence and experience a particular aroma.

User Persona



Name: Sophia Lee

Age: 38

Occupation: Marketing Director

Background: Sophia is a successful marketing professional who has a deep passion for culinary experiences, particularly Asian cuisine. She has traveled extensively throughout Asia, immersing herself in the diverse culinary traditions and flavors of the region. She appreciates the artistry and attention to detail that goes into creating authentic Asian dishes.

Personality: Sophia is an adventurous and sophisticated individual with a refined palate. She is always seeking new and unique dining experiences that allow her to indulge in the flavors and aromas of different cultures. She values authenticity and appreciates the use of high-quality ingredients and traditional cooking techniques.

Interests: Aside from her love for food, Sophia enjoys art, music, and travel. She finds inspiration in exploring different cultures and their culinary traditions. Sophia is an avid food blogger and loves sharing her dining experiences with her followers, often providing detailed descriptions of the dishes she tries and the ambience of the restaurants she visits.

Goals and Expectations: When Sophia visits a Michelin star or fine dining restaurant that specializes in Asian cuisine, her main goal is to embark on a sensory journey. She expects exceptional service, an elegant and tranquil ambience, and a menu that showcases the finest ingredients and innovative interpretations of Asian flavors. Sophia is thrilled to discover new flavors and combinations that surprise and delight her taste buds.

Experience: Sophia has dined at numerous Michelin star and fine dining restaurants around the world, but she always finds herself gravitating towards Asian-inspired establishments. She appreciates the fusion of traditional and modern techniques that elevate the dishes to a new level. Sophia often engages in conversations with the chefs and sommeliers to gain insights into the culinary philosophy and learn about the stories behind the dishes.

Persona

Name: Mei Ling's Palace

Persona Description: Mei Ling's Palace is an exquisite Asian fine dining restaurant that embodies elegance, sophistication, and cultural charm. As you step into the restaurant, you are greeted by a captivating ambiance that combines modern luxury with traditional Asian elements. The soft glow of ambient lighting, coupled with tasteful decor, creates an atmosphere of refined opulence.

The persona of Mei Ling's Palace is that of a gracious and attentive host. The restaurant staff, dressed impeccably in traditional attire, welcomes guests with warm smiles and impeccable hospitality. They possess extensive knowledge about Asian culinary traditions and take pride in sharing their expertise with patrons.

Mei Ling's Palace takes pride in its culinary offerings, curated by a team of highly skilled chefs. The menu showcases a harmonious blend of authentic Asian flavors and innovative culinary techniques. Each dish is a work of art, meticulously crafted with the finest ingredients sourced from local markets and regional suppliers. Mei Ling's Palace is renowned for its commitment to freshness, quality, and attention to detail.

The restaurant offers an exceptional dining experience where patrons can savor the symphony of flavors, textures, and aromas that Asian cuisine has to offer. The menu features a diverse range of dishes, from classic favorites to contemporary interpretations, ensuring there is something to delight every palate.

Mei Ling's Palace also boasts an extensive beverage selection, including an array of carefully curated wines, signature cocktails, and traditional Asian teas. The sommeliers and mixologists are adept at guiding guests through the beverage options, offering expert recommendations that perfectly complement the culinary journey.

With its refined ambiance, impeccable service, and culinary excellence, Mei Ling's Palace is more than just a restaurant – it is a destination where guests can immerse themselves in the rich tapestry of Asian culinary traditions and create unforgettable memories.





2.2 Primary Research

Contextual inquiry was done to understand user's perspective and opinions about electric cooking devices. It was important to prove that there is a fine category of population that cook steamed food on a regular basis.

Interviews revolved around user's experiences using an electric multi-cooker, or kettle, their cooking habits, their fondness to cook food, their willingness to invest into a new product, etc.





Testing Havells electric cooker

I tested out a Havells electric multi-cooker. It comes with a plastic casing, stainless steel inside, a glass lid, ergonomic handle, and a power cord. It also comes with a removable plastic basket to steam food. It has large opening, is easy to use as well as clean. The device is small enough to fit in a suitcase trolley but not small for a backpack unless you are willing to carry it.



Product Review of Havells Electric Multi Cook Kettle:

1. Good for an individual: The Havells Electric Multi Cook Kettle is well-suited for individuals who prefer cooking small portions or single servings. Its compact size and capacity make it convenient for preparing meals for one person.

2. Not recommended for a group at single use: This device may not be suitable for cooking for a larger group in a single use. The limited capacity might lead to multiple batches of cooking, which can be time-consuming and impractical for cooking larger quantities.

3. Cannot see the food clearly, need to open to check: One drawback of this kettle is that it lacks transparency, making it difficult to see the food's progress without opening the lid. This can be inconvenient as it disrupts the cooking process and increases the chances of heat loss.

4. No smell: One positive aspect of the Havells Multi Cook Kettle is its ability to contain food odors effectively. This feature is beneficial for those who dislike lingering smells in their kitchen after cooking.

5. Soggy food -A common issue with this device is the accumulation of condensation on the lid, which can cause water droplets to fall onto the food. This can result in soggy or less desirable textures in the cooked food.

6. No timer or auto cut-off: The absence of a timer or auto cut-off feature is a notable limitation. This means users must be cautious and manually monitor the cooking process, which can be inconvenient and lead to overcooking or burning if not attended to promptly.

7. Cooking area gets messed, water drops everywhere: The cooking area tends to get messy due to water droplets accumulating and splashing around during the cooking process. This can require additional cleaning efforts and be a source of inconvenience.

8. Confusion on volume of water to be put, no water level indicator: The absence of a water level indicator can create confusion regarding the appropriate amount of water to be used while cooking. Users may need to rely on guesswork or trial and error, which can lead to inconsistent results.

9. Button is difficult to operate with a single hand: The design of the operational button may pose challenges for users attempting to operate it with a single hand. This can be inconvenient, especially when multitasking or needing to maintain a steady grip on the kettle.

10. Water drips and falls on the food while removing the glass lid: It was observed that water tends to drip and fall onto the food when removing the glass lid. This can be problematic as it compromises the presentation and quality of the cooked food.

11. No water level indicator to see while cooking: In addition to the lack of a water level indicator for measurement, this kettle also lacks a visible water level indicator during the cooking process. This limitation can make it difficult to assess the water level without interrupting the cooking cycle.

12. Outlet on top causes accidental burns: The positioning of the outlet on the top of the kettle has led to some accidental burns when handling or pouring from the kettle. This is a safety concern that should be taken into consideration.

3. PRODUCT BRIEF

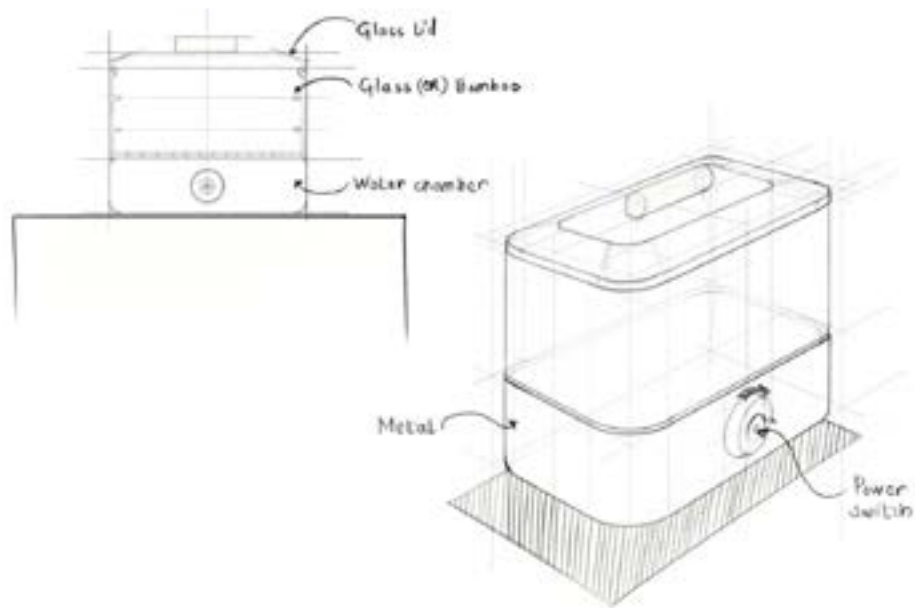
To design a steam cooking device for Asian fine-dine restaurant that can enhance the experience of cooking, serving and having the food, and

- is a multi-cooker
- is modular - modules for idli, momos, dhokla, meat, seafood, vegetables, etc.
- is haptic
- is aesthetic and urges interaction with the user.

Mockup 1

Vacuum formed acrylic lid

Wooden Mold



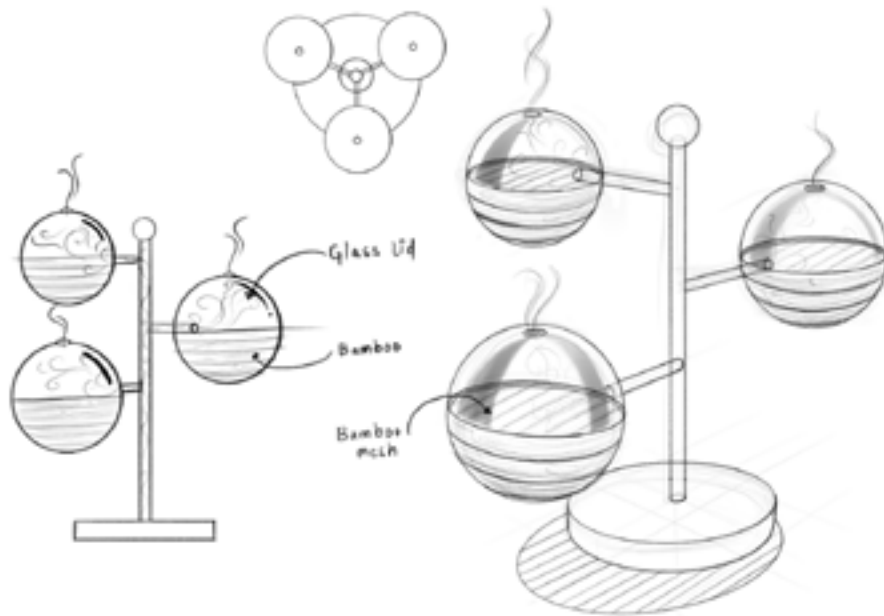
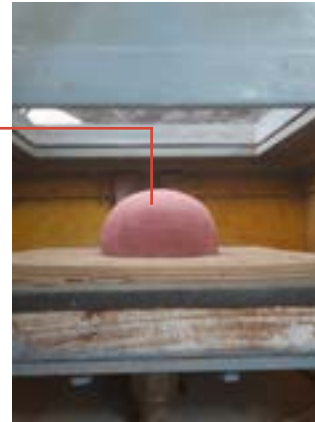
Vacuum Forming

Transparent acrylic sheet, 0.8 mm



Mockup 2

Mold

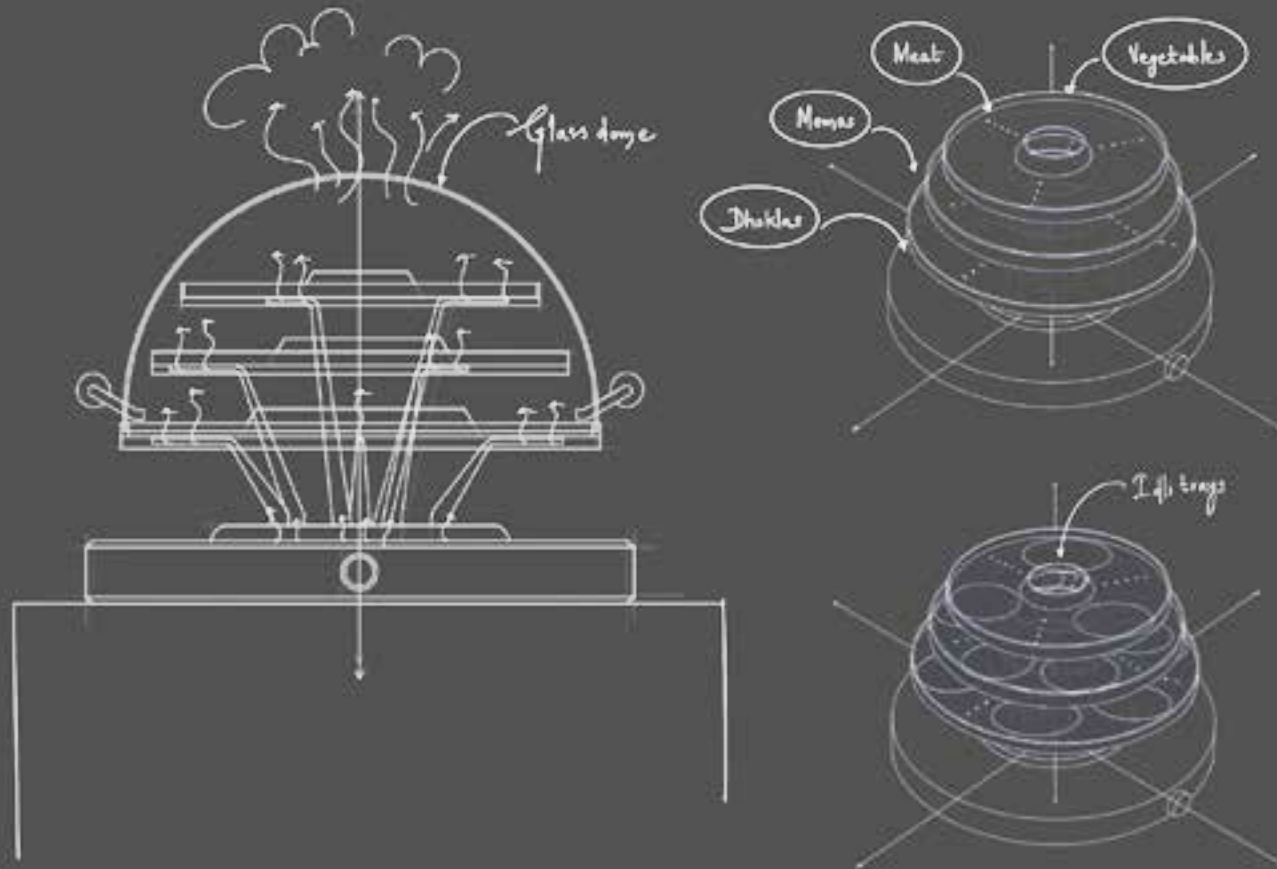


Vacuum Forming operation

Transparent acrylic sheet lid, 0.8 mm

5. CONCEPTS

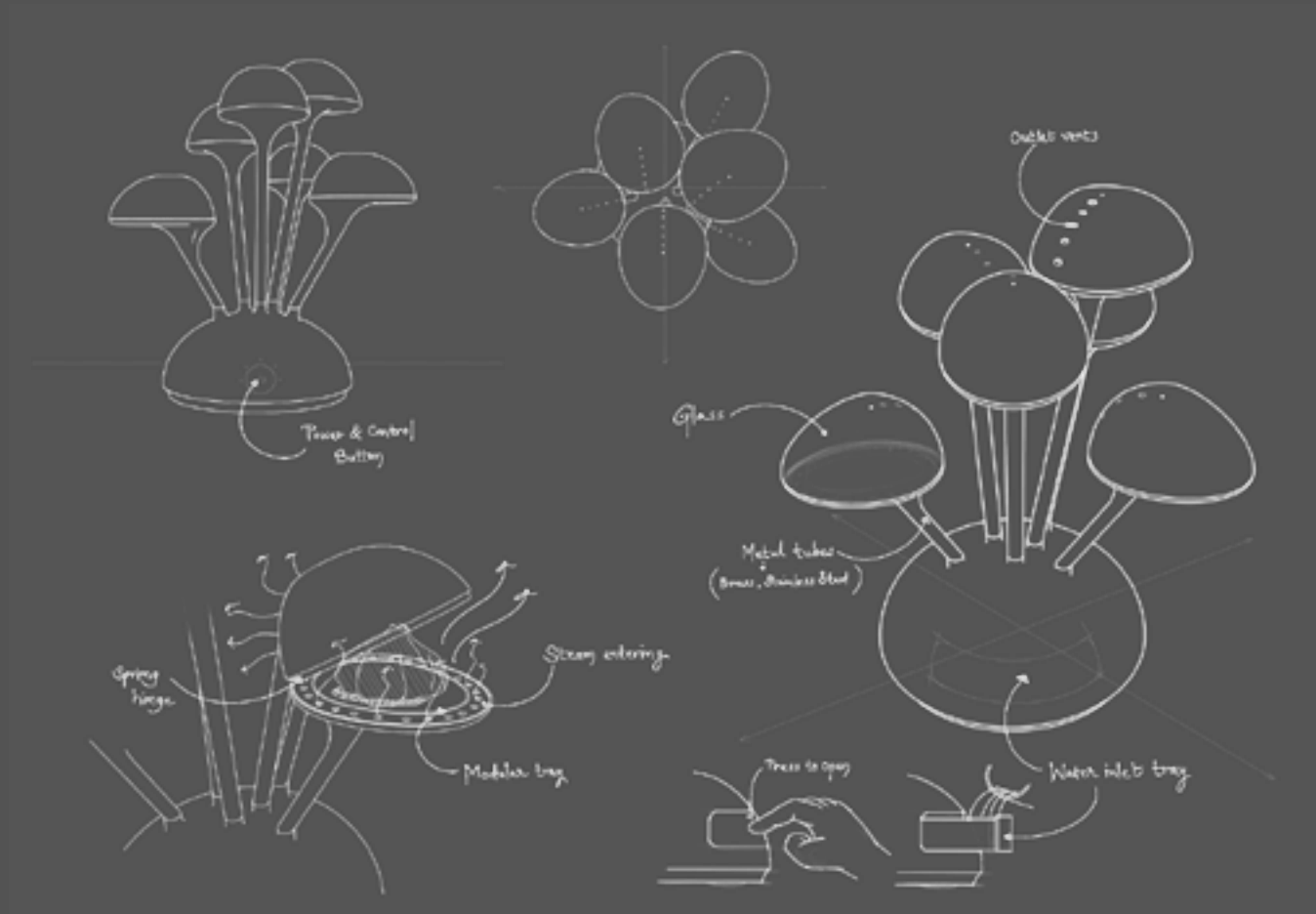
5.1 Concepts



Concept 1 :

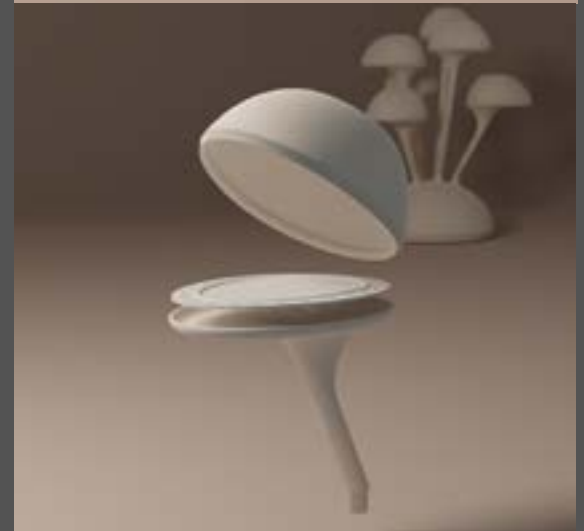
Concept 1 has 3 levels for food to be kept and has a common dome. 3 steam inlets at each level allows even distribution of steam inside the dome. It comes with variable trays for different types of food. Vegetables, Dim sum, momo, meat, and dhokla, for instance can have a common tray, while idli trays could be separate. Similarly, there could be various such modules to fit the cuisine.





Concept 2 :

Concept 2 focuses on aesthetics and functionality. the concept product has 6 levels, each level having a tray covered with glass lid. The interplay of steam is very pleasing to the eyes. Aroma essence are added in the water that disperses in air and gives a pleasant smell while the food is being cooked in the front.



5.2 Making a working-rig

A working rig was made to test the design idea. Stainless steel plates and tubes were used to make the rig.

An existing setup was used to test the rig. Havells electric multi-cooker was used as a base and source for steam generation. The glass lid of the device was utilised to direct steam into the tubes through a hole where the lid handle was set. By removing the handle, I got an opening in the center of the lid and sealed the vent with tape.

The metal structure made was simply placed on the glass lid and the device was turned ON after filling it with water. In theory, the device would boil the water and channel the steam through the tubes and into the tray where food is kept.







5.3 Working-rig testing

Rig to be tested for different food items such as vegetables, momos, meat, etc.

The aim of the test is to explain the mechanism of working and time taken to cook the food and establish standards for the product.

Results

The rig successfully cooked all kinds of food in approximately the same as standard steam cooking device.



6. MOCKUP







7. Fumi











8. References

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Thank you