Report : Week 03

Ideation & Concepts

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This report summarizes the work that we have done and the progress that we have made regarding our Collaborative Design Project over the past one week (03/11/2020 - 09/11/2020). The main focus was to ideate and come up with concepts to solve our problem.

We did a role play where we pretended to be the user, customer and product in multiple scenarios and we realized that people would only use this alternative if it is as simple as hand transactions. People adapt to new methods only if it makes their life easier or it brings them profit. Something that's connected with the money box rather than something entirely different might increase the probability of usage.

An Overview of our Timeline.

- **Monday (02/11/2020)**
    - Rest
    - Good 12 hour Sleep

- **Tuesday (03/11/2020)**
    - Further Research
    - Ideation

- **Wednesday (04/11/2020)**
  - Ideation

- **Thursday (05/11/2020)**
  - Feedback Session
  - Ideation

- **Friday (06/11/2020)**
  - Ideation

- **Saturday (07/11/2020)**
  - Idea Clustering
  - Conceptualization

- **Sunday (02/11/2020)**
  - Presentation Building
  - Report

- **Monday (03/11/2020)**
  - Presentation 03

Final Problem Statement from Week One

Cash Transactions are responsible for disease spreads (not just corona but million more existing diseases) and making physical cash transactions contactless would keep a check on hygiene to a certain extent.


Before further Ideation

Taking the feedback from our last presentation into consideration, we decided to look more into the working mechanisms of already existing products before focusing on outward appearances and other features.

We decided to make a plan for the week and stick to it. Our plan is as follows :

- Make a Mindmap of the broadest possible areas for Ideation
- Pick branches for the group to work on, individually
- Ideate on a particular Area
- Cluster Ideas depending on the context.
- Create Concepts using the Clusters.

New Mind Map
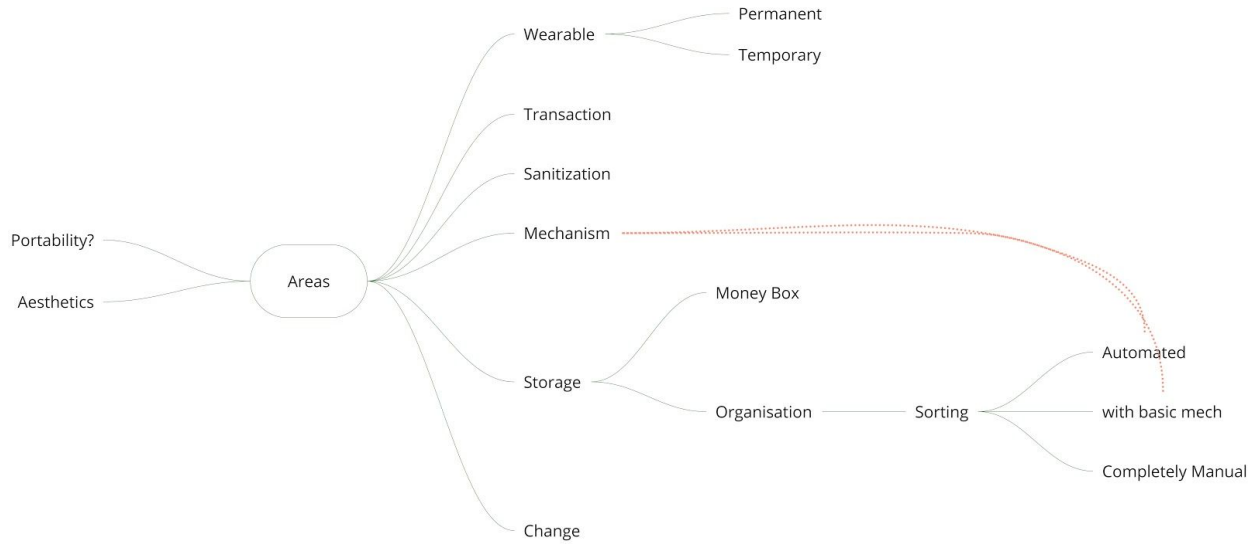
This Mind Map summarises the areas that we could work on regarding our topic. The right side deals with the type of product and the issue to deal with while the left side deals with a few features that would be great if the product was equipped with.

Inspiration Board

The official definition of the term "**cash register**" is "a business machine that usually has a money **drawer**, indicates the amount of each sale, and records the amount of money received." A **cash register** logs transactions that occur in your store, creating a record of the money coming in and going out. Jul 6, 2020

Areas and Related Ideas

1. Money Box

We came up with multiple ideas for Money Boxes. We were initially just looking at a fully manual system, but now we realized that even semi-operated ones would work as almost all shops have access to electricity. And even if they don't we are thinking of having a manual-operated or battery run, version of the same if we get to proceed in this direction.
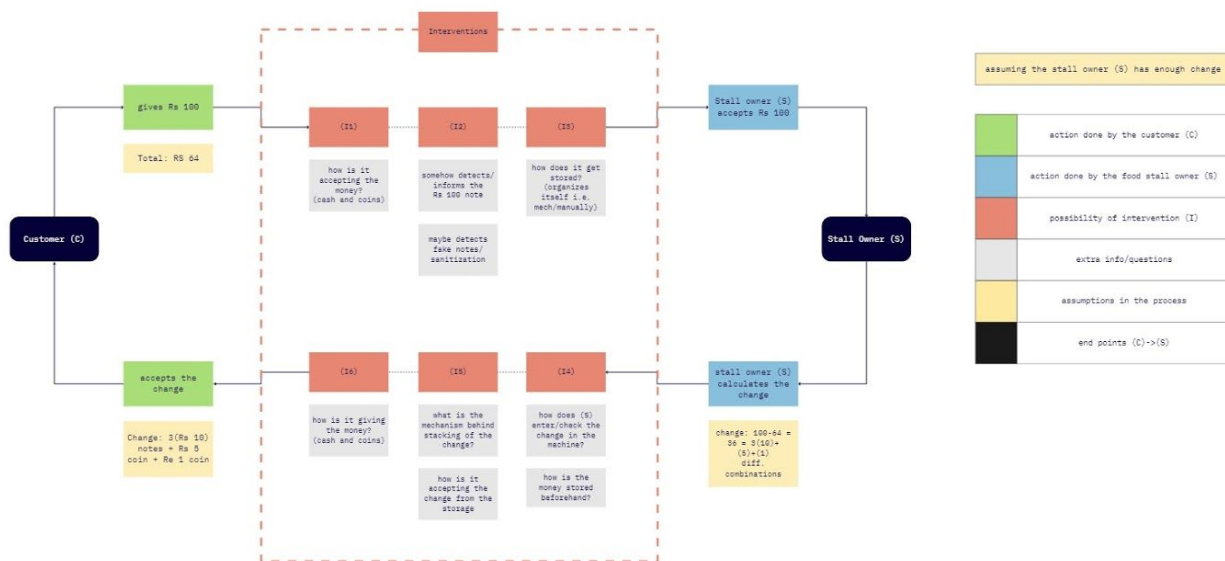
We decided to create a basic flowchart to understand the interaction between the customer (C) and the stall owner (S) with the money box incorporated. We realised that we would have at least 6 more interventions i.e. six more issues that we would need to focus on while incorporating a money box.

Idea 1 : Buttons and Levers
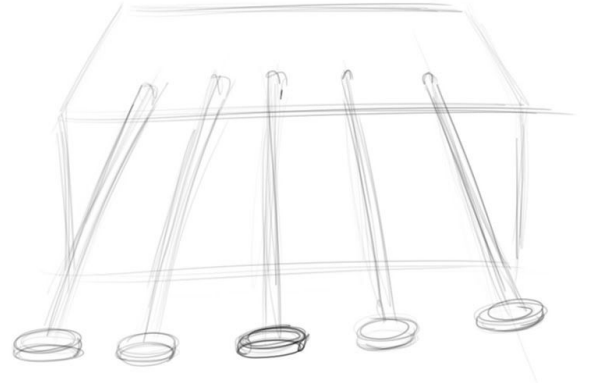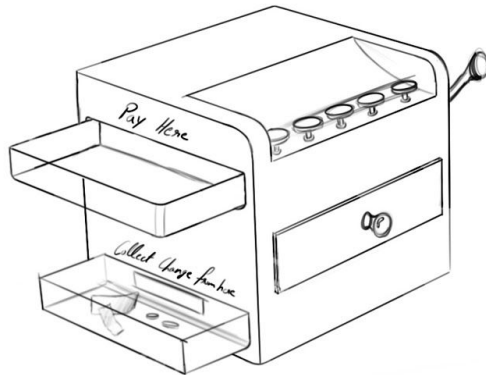
This money box idea has two different compartments, one for money acceptance and one for change return. There are different buttons for different values of notes and the stall owner presses those buttons accordingly to give the exact change amount. After he's done pressing those buttons, he can pull the lever to confirm change in return.

Idea 2 : Lever box
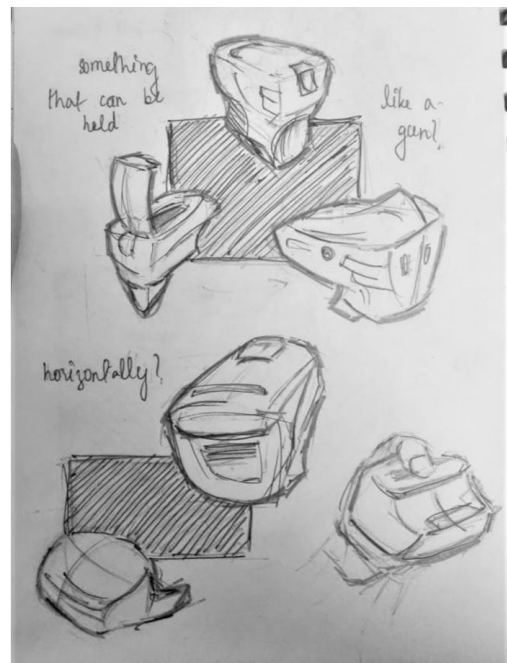
This is one of our initial ideas where we were looking into basic mechanisms on how the stall owner would interact with the money box. This one looked into how tactile the interaction would be, hence we went with a lever mech, and the old fashioned number display. It has a box on one side that accepts money and on the side it counts and accepts money. We were actually at a stage where the mechanism was mostly a haze so we looked into outer aesthetics based on how it would work.

The other idea mostly revolved around havimething small and portable that does the job of accepting and giving back the money. The form is actually inspired by that of a money gun (which is actually a fun toy) but does the job of being contactless.

Idea 3 : Number Gears
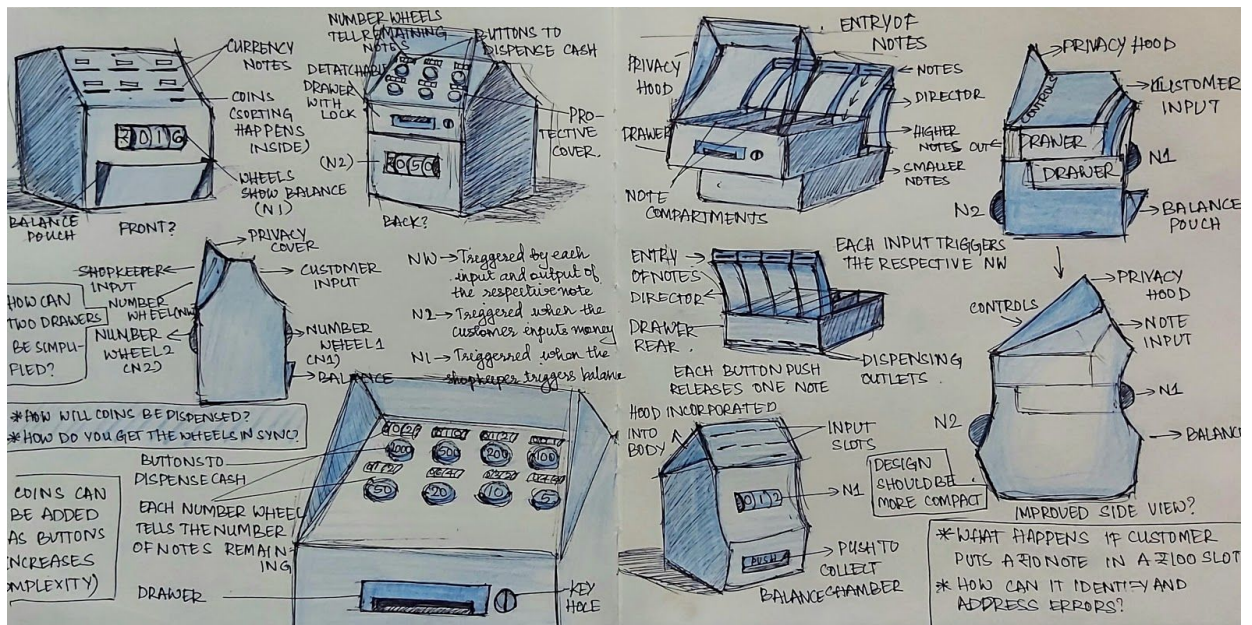
This is very similar to Idea 1. This one is also a Money Box of sorts but works with the help of Number Gears and Buttons. The Shopkeeper's side and the Customer's side have different interfaces. Each currency has a different slot and the customer has to input money accordingly. The shopkeeper's side has number wheels for each denomination keeping him aware of the number of each denomination left at any given time. For every input the number wheel of the respective denomination is triggered, increasing it by one, and for every balance output from the shopkeeper's side will trigger the number wheel of that denomination to reduce by one. Whenever money is input, it falls into the respective compartments of the detachable drawers inside the box. The Number Wheel (N2 in the diagram) tells the shopkeeper the amount input by the customer and the Number Wheel

(N1) in the diagram) tells the customer the balance amount returned by the shopkeeper through the balance pocket.

Additional features : Privacy hood for the shopkeeper

Drawbacks :
- Coin Sorting will make the experience more complicated. Has not been added as of now.
- Possibility of the customer putting in a wrong/fake note in a slot by accident or on purpose.

Idea 4 : Dividing Interactions?
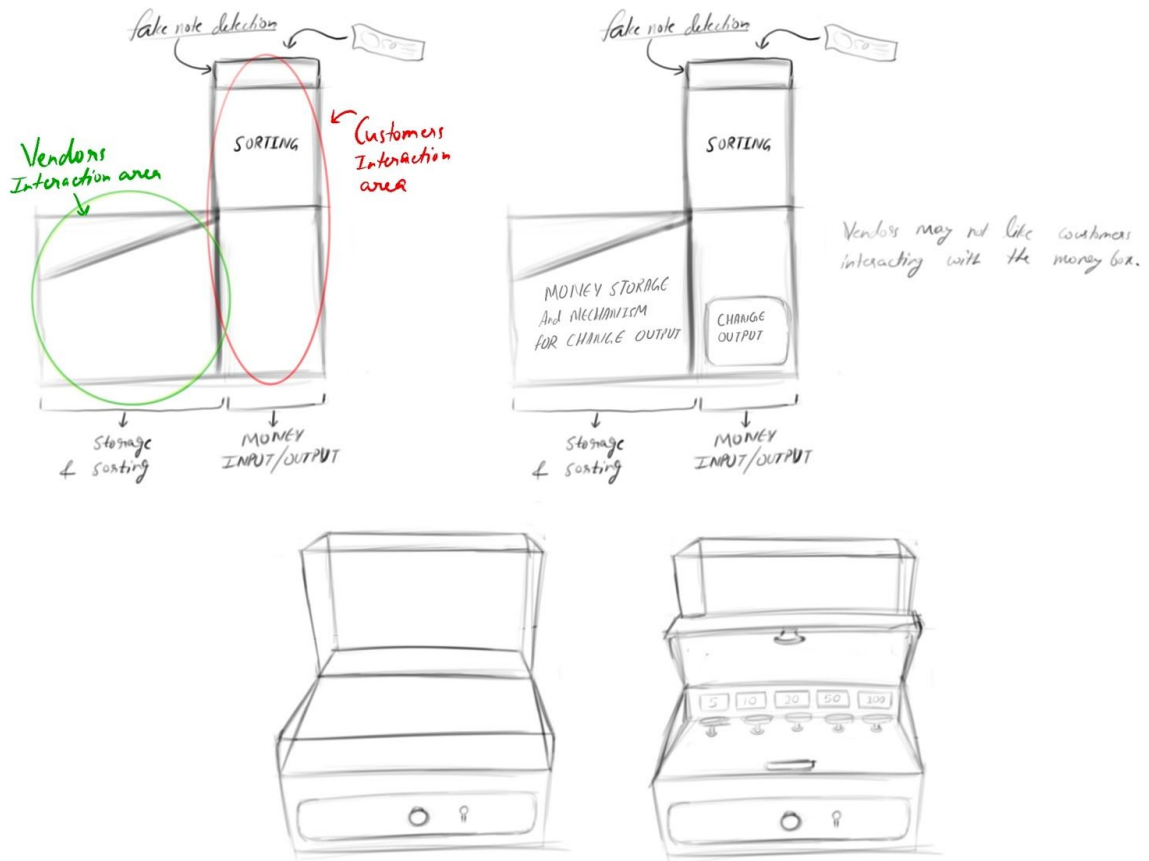
This idea arises with the issue that the shopkeeper might not be comfortable with customers touching his money box. So we divided this money box into different sections. Venders interaction area and customers interaction area. In the customer's interaction area we added a fake note identifier, money sorting mechanism and change output compartment. On the vendor side, there is money storage and a mechanism for the change output. The whole concept was to make the vendor feel secure of his money box. Even

though both customers and vendors are connected, the form should make it feel separated and secure and should be convenient for both sides.


Idea 5 : Curvy slope
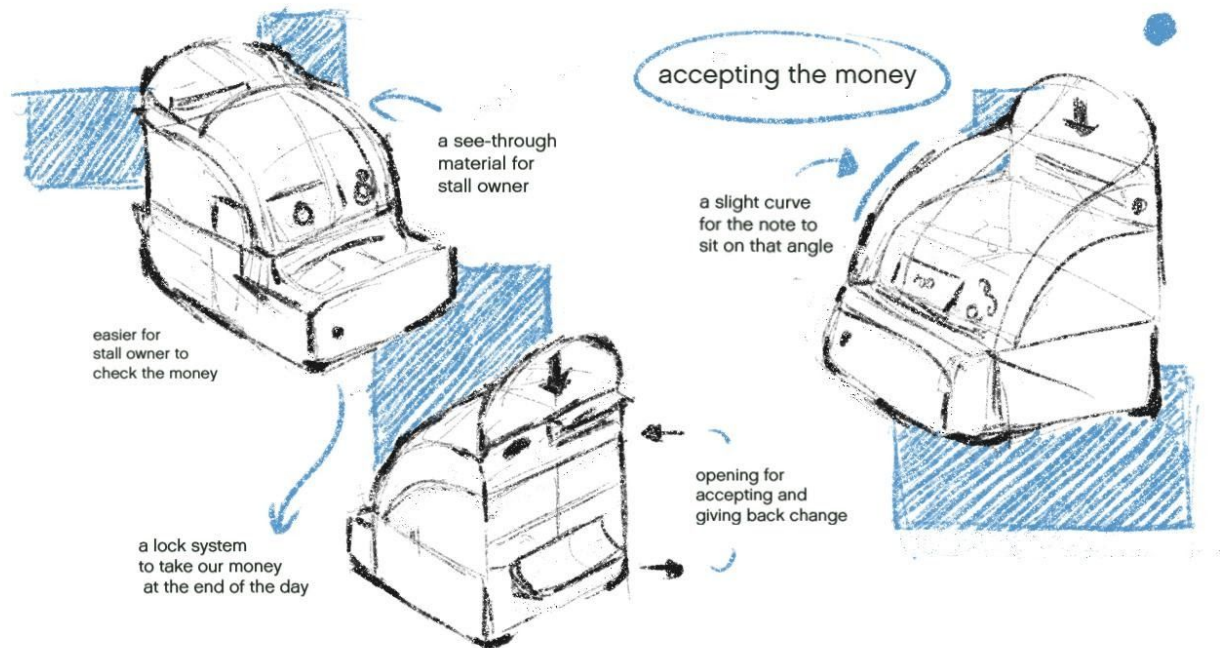
This idea is mostly based on the first half of the flow interaction diagram between the customer and the stall owner, which mostly deals with accepting the money. It has two basic openings on the front side, one is for accepting the money (and coins), and the bottom part so the customer can collect the money at the end of the transaction.
Once the customer places his money through the slip it kind of slips down just so it sits in that level so the stall owner on the other side can have a good look at the money before making it enter his money box. This can be achieved with the dome ish curve which makes sure the note and coins reside in that angle.

While this part doesn't involve any sort of mechanism (yet) as it is just the first half, if we were to think realistically it would be hard to install this in a place with such space restrictions, not to mention the maintenance cost for something this simple. Again, it did not seem very realistic, the stall owner might as well ask the customer to show the money.

Idea 5 : Idea 3 extension
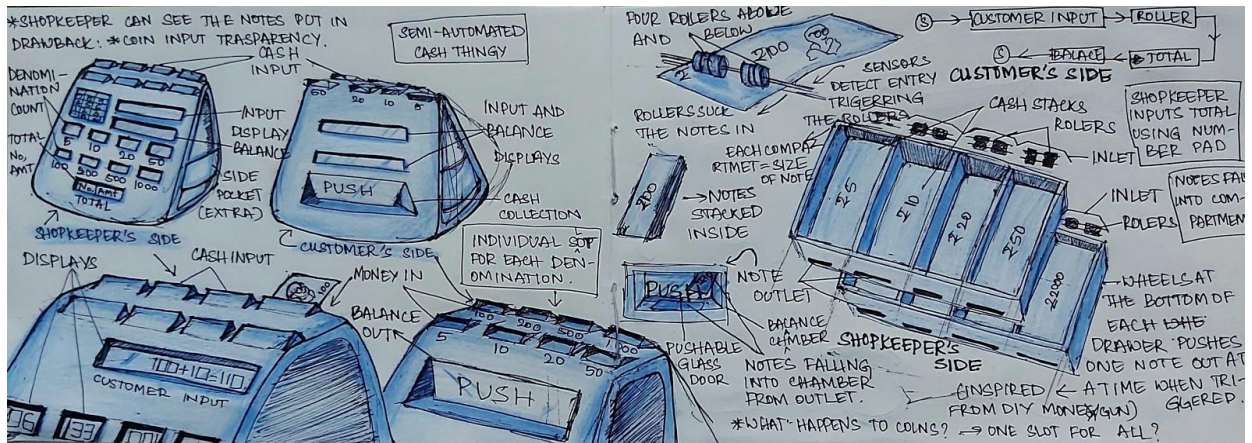
This, again, is very similar to Idea 3, but without Number Wheels. This one is semi-automated and requires power to run. The money input will be pulled in instantly with the help of rollers linked with sensors just like in a printer or a vending machine. The money output is triggered after the shopkeeper types in the total amount and the customer inputs a note in the respective slot. The balance amount falls into the output chamber right below the input area on the customer's side from where it can be collected by the customer. In this case, the shopkeeper can see what the customer is inserting, where. So it is safer than Idea 3.

Drawbacks :
- Coin Input
- Transparency, if coin input is a feature

Idea 6 : Fake note identification

After our interview with the cashier, we got insights on what technique he uses to recognise fake money. He told us that the metal strip on the note changes its colour from green to blue when seen at particular lighting. Also how light can show some of the hidden visuals of the note. He even gave us some insights on how just touch can be enough to recognise money, but the sense of touch is useless in our case as we are going for a contactless transaction.

For this idea, we added a light that has a flexible movement so that the vendor can optimise its angle for his eyes height.

Another idea was to have a glowy base that will allow the vendor to see those hidden visuals as well as some tears if present any.

2. Wearable

We put some thought into figuring out a mechanism that would eliminate contact between the shopkeeper's hands and money rather than changing the whole transaction system itself.

### Idea 1 : Palm Gloves with Retractable Grabber
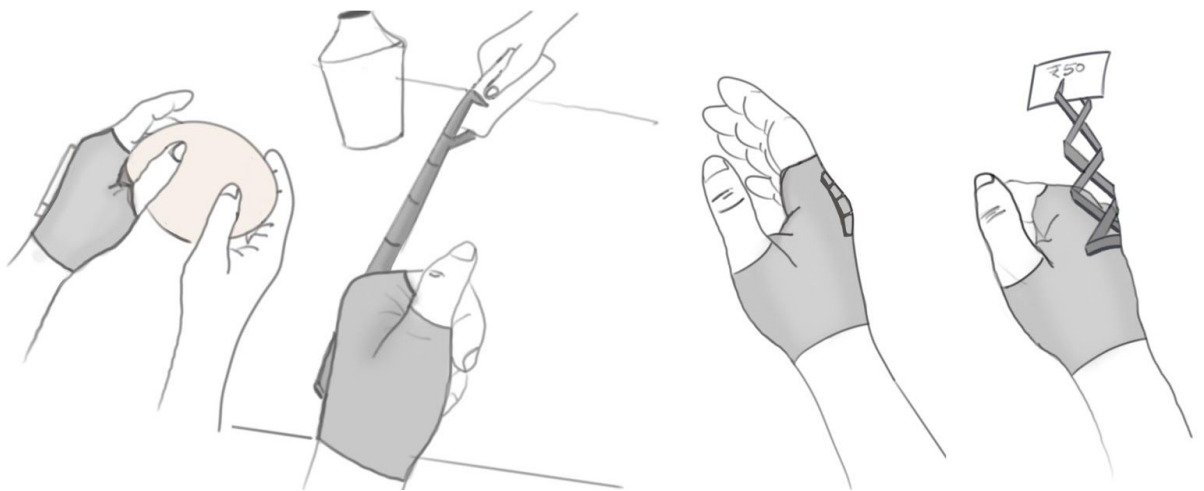
A hand grabber gave rise to this idea. This is a glove that is equipped with a retractable grabber, which when triggered by pressing the inside of your pal (glove), unleashes a small grabber of sorts that can be used to accept and return the money. This can be worn

throughout and not for transactions alone. Magnets can be added at tips for easy picking up of coins. The claws and the mechanism haven't been worked on yet.

Advantage : Fingers are free, unlike normal Gloves.
Drawback : The glove will hinder certain activities like rolling dough into balls.

Idea 2 : Rings aren't just accessories
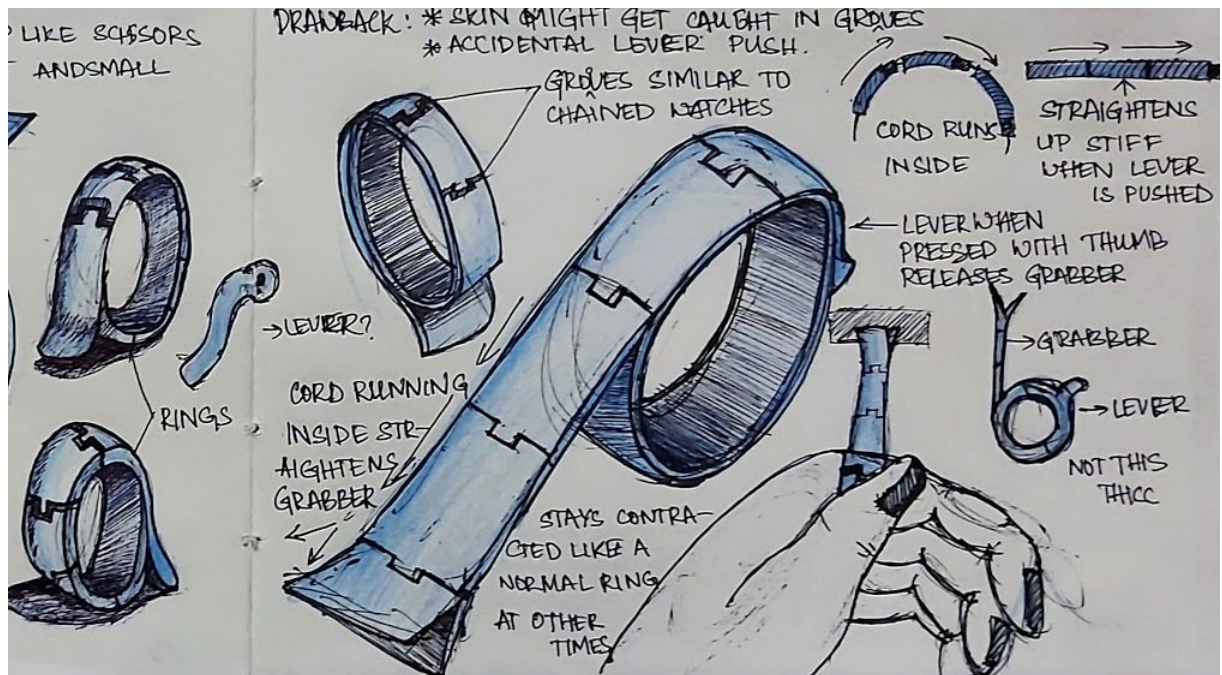
This uses the same principle as that of Idea 1 of wearables but is slightly better and more practical. This is just a small ring with a lever that is to be worn on the index finger and the lever is to be pushed by the thumb during the transaction process. Segments are laid down on the ring, with a cord passing through them. The lever when pushed, tightens the cord, stretching the segments out into a stiff straight grabber. This can be worn throughout and not for transactions alone. Magnets can be added at tips for easy picking up of coins. The grabbing mechanism is yet to be worked on.

Drawbacks :
-   The skin might get caught in between the segments.
-   The lever might accidentally get pushed triggering the grabber

Idea 3 : Baby Scissors
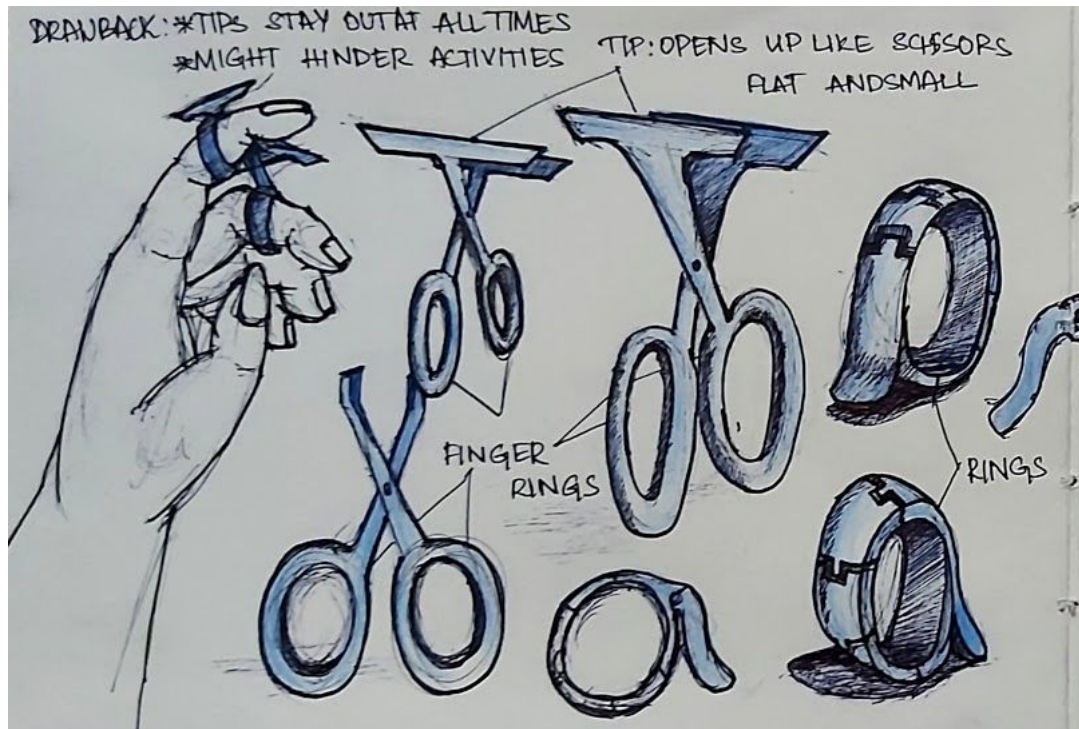
This is another wearable that can be worn throughout the day. We realized that the index finger and the middle finger only have restricted motion. The heads of the scissors ish thing fit on the index finger and the middle finger but goes only halfway through. This does not further restrict the motion of those fingers and other activities can also be carried out. One arm can be made extendable for extra freedom of movement. At the time of the transaction, the user can just reach out and carry it out like a normal transaction but using these instead of using hands. Magnets can be added at tips for easy picking up of coins. The structure of the claws hasn't been worked out yet.

Drawbacks :
- The user won't feel comfortable unless the rings are carefully designed
- The arms stick out which could hurt someone

Idea 4 : Coily attachable
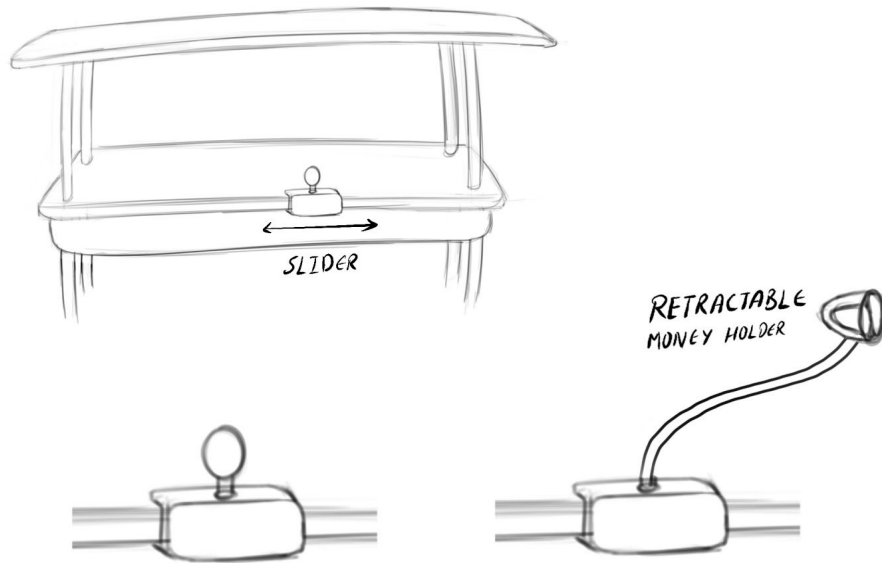
This idea has a slider that can be attached to any cart so that the vendor can use it on any side of the customers. It has a retractable money holder that is meant to be used only while doing money transactions so after each usage it comes back to its own location. The plus point about this idea is that the money holder comes back to its own location after each use. And a minus point can be as it is a completely separate product, the vendor might forget or will not want to use this.

Idea 5: removable glove
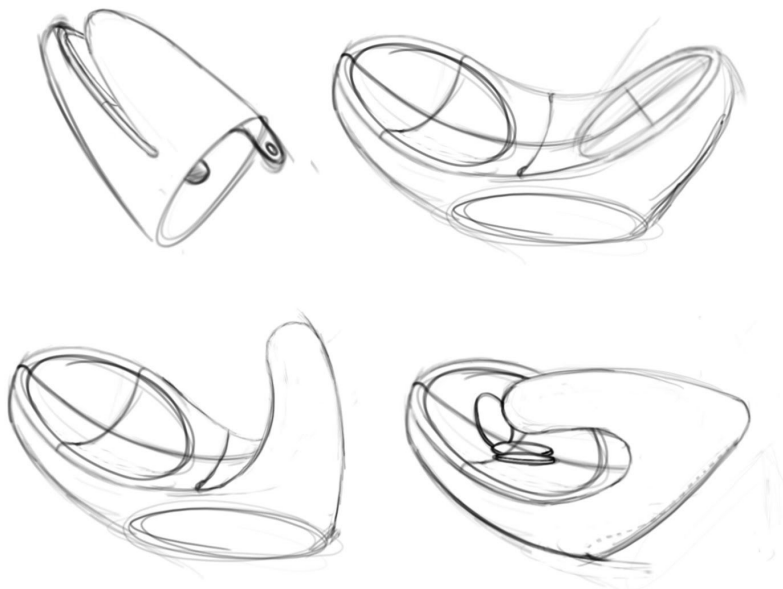
This idea came from a very basic glove but more optimised for money holding/counting. The whole idea was to have something that can be easily removable so it does not hinder the real cooking process. A few down points were that food gravy or moisture might easily get inside and may create some hygiene issues.

Idea 6: Tongs
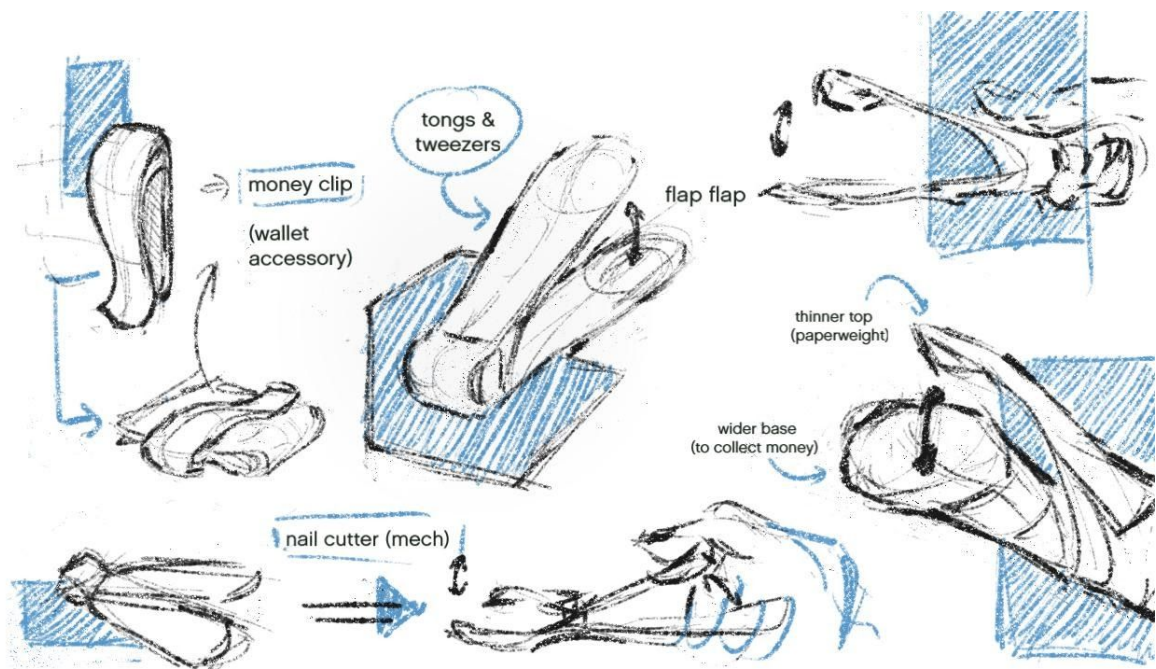
This idea has a similar mechanism as that of tongs and tweezers. Although the main inspiration came from the money clip, which is actually a wallet accessory (so simple yet has a huge part for making it easier for people to keep money in wallets. With that we were also looking into other simple mechanisms, like a nail cutter, which essentially does the job of holding and picking up money. With the final design, we have a top which is narrow and acts as a paperweight while the bottom is wide and caved inwards to collect the money.

While this does the job of a simple mechanism and does not take up too much space, some would argue that it looked more like a kitchen utensil rather than a cash accepting object. Hence the visual cues which makes it relate to money is missing.

3. **Sanitization**

"If something is not clean, we clean it rather than avoiding contact with it", said Vanshaj out of the blue and that's when it hit us.

Money is something that is under constant circulation throughout the country; in fact, all across the world. It just suddenly made so much sense to sanitize money in the easiest, cheapest, and fastest manner possible.

Role Play

We did a role play where we pretended to be the user, customer and product in multiple scenarios and we realized that
- People would only use this alternative if it is as **simple** as hand transactions.
- People adapt to new methods only if it makes their life **easier** or it brings them **profit**.
- Something that's **connected** with the money box rather than something entirely different might increase the probability of usage.

Comparison

Wearable

Green notes:
- doesn't hinder the cooking process
- Magnets for coin transactions, Small, Cost Effective, Size variants
- Cost Effective
- does not take up too much space
- a simple holding motion of notes (like tweezers), simple
- Size variants
- Retractable
- allows easy coin counting
- Small
- can be easily removed

Pink notes:
- May not be comfortable, Arms stick out which could hurt someone
- what about notes?
- what about coins?
- Skin getting caught in between segments
- food gravy or some moisture can easily get inside
- mistake it for utensil, no visual cues for money
- accidentally pushing the lever which triggers the grabber

Money Box

Green notes:
- Privacy hood for the shopkeeper
- Easy Cash Input
- Privacy
- evident visual cues
- Almost fully manual
- Semi-Automated
- Cost Effective
- convenient for both sides

Pink notes:
- Coin Sorting
- Can get too complicated,
- Transparency, if coin input is a feature
- Bulky
- Coin Input
- Takes up too much space,
- Completely separated from money box, might end up not using it
- Fake/Wrong notes
- usually stalls don't have enough space

The major advantages of the wearables were
- their size and the fact that
- they could fit in anyone's budget.
- They could also come in various sizes.

The downside was that
- people may not find them comfortable unless carefully designed.
- Food and other particles may get stuck in it causing hygiene issues.

The major advantage of the money boxes was
- the easy cash input feature and
- the fact that they could be cost-effective.

The downsides heavily complemented the advantages.
- The working could get too complicated and people might end up not using them.
- Fake note detection and the bulkiness would also add to the downsides.

Thank you,