# Breakfast Machine

Team Sweet Potatoes

## Overview

This document presents an in-depth look into how a team of three UX Designers tried revamping the current breakfast experience for hustling, bustling university students at Purdue. This breakfast machine was prototyped and ideated multiple times. After each ideation round, the team answered some questions while creating room for some more. This way, we were able to develop a final design idea that we condensed into the form of a video.

**Ali Asghar Aamir**
**Noverah Khan**
**Vishwa Chandupatla**

# Table of Contents


**Overview** **1**

**Behold, the breakfast machine** **4**

**The Process** **5**

**The current state of toasters** **6**

**Sketching** **7**
- Session 1 7
  - Rationale 7
  - Details 7
  - Takeaways 8
- Session 2 9
  - Rationale 9
  - Details 9
  - Takeaways 10

**Cardboard** **11**
- Rationale 11
- Details 11
- Testing and takeaways 12

**Paper Prototyping** **13**
- Rationale 13
- Details 13
- Testing and takeaways 15

**Lego Prototyping** **16**
- Rationale 16
- Details 16
- Takeaways 16

**Limitations** **17**

**Conclusion** **17**

**Appendix** **18**
- 1.0 Other Cardboard Prototypes 18
- 2.0 Other Paper Prototypes 19

3.0 Other Lego Prototypes 20
4.0 Clay Prototypes 22

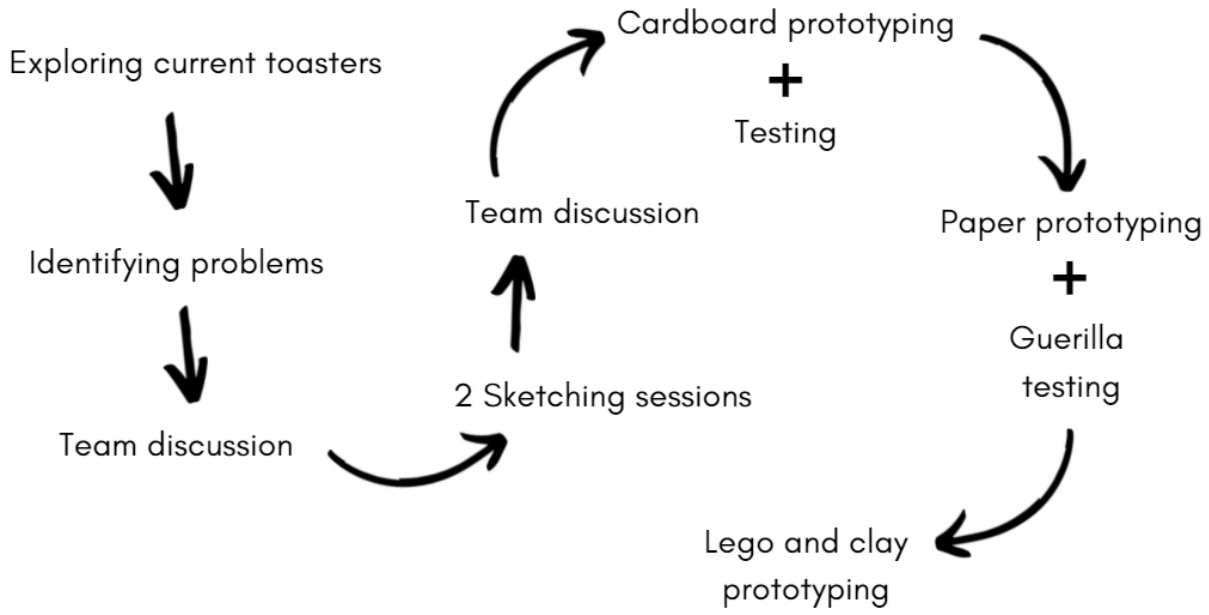
# Behold, the breakfast machine

Our design idea of a multi-channel breakfast machine provides users in communal spaces with fast and substantial breakfast. Some of the key features of this device are:

- Provide the users with a multi-channel experience (that works by ordering breakfast through their phones or from the machine.
- Serve users a sandwich with their choice of bread (white/brown bread and croissant), and spread (cream cheese, butter, and guac).
    - Provide the option to visualize the amount of toast and spread.
- Serve a drink of their choice (medium brew coffee or water).

Link to the video

# The Process




We started off by exploring the current state of toasters and the breakfast experience involving the device.

Next, we brainstormed and sketched out our ideas for toasters in the form of two sketching sessions followed by a team discussion. This exercise was followed by cardboard prototyping which was done to find out about the ideal size of the device. This changed our course to a communal breakfast machine making the team realize an experience rather than a toaster would be the way forward.

After cardboarding, the team went for paper prototyping followed by guerrilla testing, to answer the following question: what do the user journey and experience look like? The final question the team had was: how do we put the device together? This was answered through Lego prototyping.  We also played around with clay to locate the placement of the tapping points on the machine but did not use it for the final design (Appendix 4.0).

# The current state of toasters

The team identified several problems with the current state of toasters which include the following:

- The user is **unable to see the bread** while it is being toasted. As a result, the toast may get burnt or simply be under or over toasted than the desired outcome.
- The entire breakfast experience takes the average young adult **around 12-15 min** when they are in a hurry to catch their first class.
- The current smart toasters are **really expensive** (more than $350 on average).
- People **forget the bread** after putting it in the toaster as they have so many other things to do in the morning and are in a hurry.
- In some cases, the bread slices **may become cold** by the time the person is preparing something else.
- Current vertical toasters only allow **toasting for regular bread slices**. The users may have to use the oven for toasting larger bread like croissants and baguettes.
    - Even though there are some large toasters, they **take up too much space on the kitchen slab**.

*Image 1 (source)*

*Image 2 (source)*

*Image 3 (source)*

# Sketching

## Session 1

### Rationale

After identifying some of the concerns with the current toaster experience, the team moved to sketching, **to brainstorm some ideas to address the problems**. As a team, we came up with multiple ideas of which the details are listed below.

### Details

During our initial sketching session, the team was able to sketch out 3 ideas for a toaster through which we were able to brainstorm some ideas that would contribute to the design and functionality of our design.

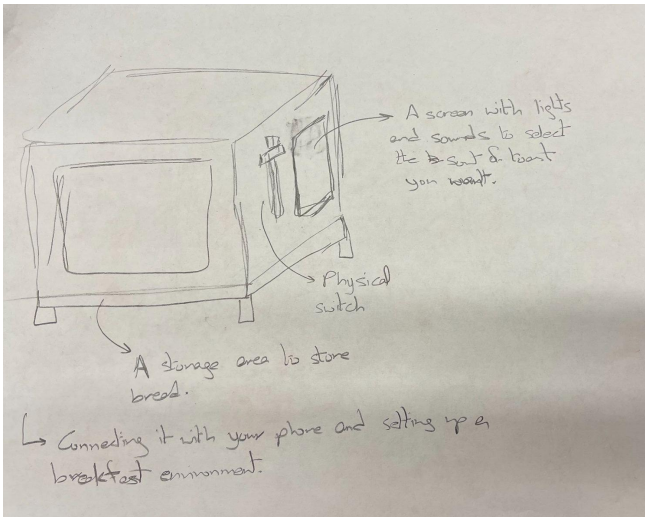



*Fig 1.1*

- A screen for multi-channel input.
- A storage area to store different types of bread.
- A physical switch that relies on the users' existing mental model of toasters.

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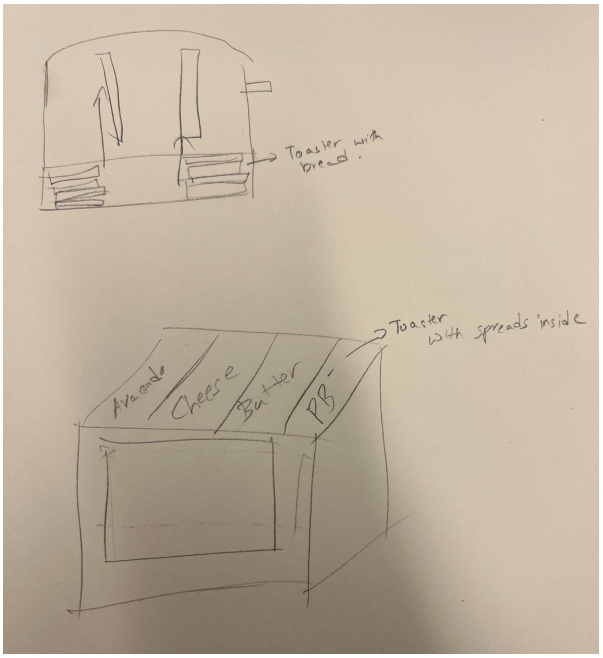
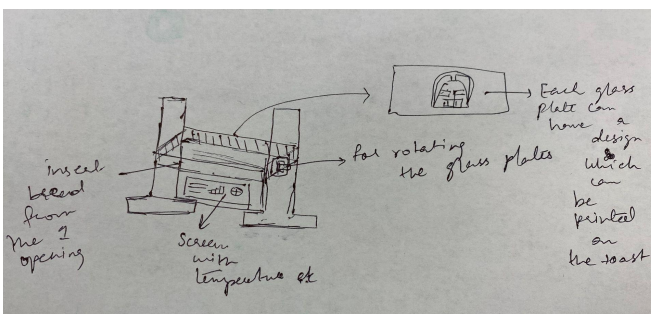
|  <br>*Fig 1.2* | • This idea consisted of including the option to store bread at the bottom of the toaster.<br>• Ability to store desired spreads at the top. |
|  <br>*Fig 1.3* | • The toaster can be rotated to a vertical position through the knob on the side to save kitchen space.<br>• Screens with different patterns are available to print on the bread slices (which may be appealing to children).<br>• The toaster screens are transparent so the toast is visible during the toasting process. |

## Takeaways

Through our first sketching session, we had some takeaways from each sketch that we wanted to implement in our toaster.

From Figure 1.1, we took the idea of **a multi-channel experience for a toaster**. Figure 1.2 helped us in including the idea **to store bread and spreads within a toaster**. Through Figure 1.3, we gained the idea of **the ability to visualize the toast of the bread for the user**.

# Session 2

## Rationale

Following the first sketching session, we felt that we still lacked a clear understanding of the functionality of our idea, specifically the multi-channel experience. Therefore, we went ahead with another round of sketching **to gain more insight into our design ideas and generate questions**.

## Details

During this sketching session, we came up with a few sketches that gave us more details of the functionality of our ideas.

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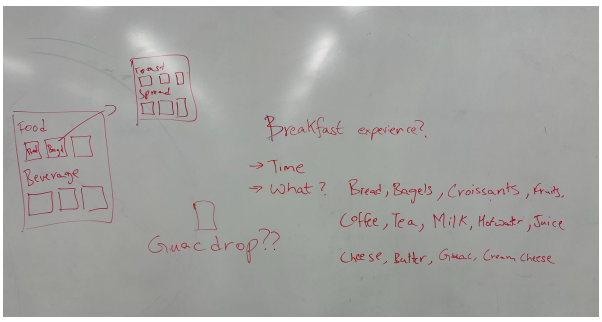
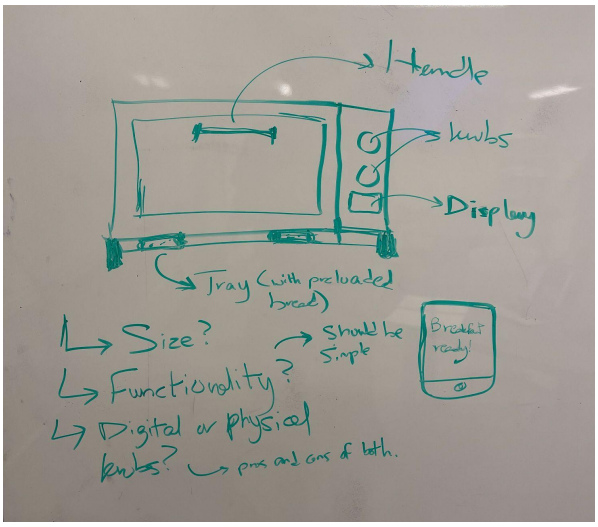
|  <br>*Fig 2.1* | • Approached with thinking about the whole breakfast experience.<br>• Ability to serve breakfast with bread, spread, and a drink of the user's choice.<br>• Place the order through a mobile or the device. |
|  <br>*Fig 2.2* | • Knobs to adjust the heat and time.<br>  ○ Digital and physical knobs experimented with.<br>• A handle to open the tray and access the bread.<br>• Questions regarding size and functionality were primary takeaways. |

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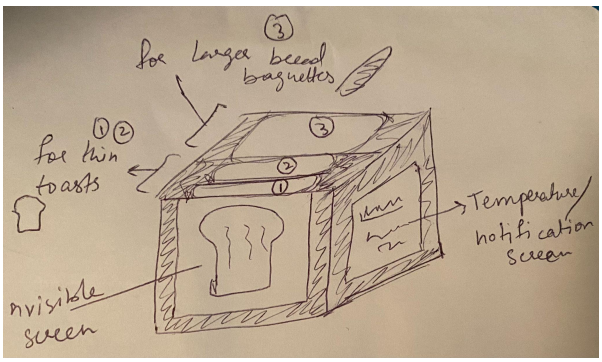
|  <br>*Fig 2.3* | • 2 slots for regular bread slices.<br>• 1 slot for larger bread like croissants or baguettes.<br>• An invisible screen in front to see the progress of the bread (its color change).<br>• A 'smart' screen on the side for temperature settings and sending notifications on the user's phone once the bread is ready. |

## Takeaways

Going ahead, at this point the team had 6-7 diverging ideas. However, we did not know how to converge on one idea to move forward. For that purpose we had a list of questions we wanted to answer, some of them included:

- **What is the size of this device?**
- **Will it be horizontal or vertical?**
- **What are the features and how does it allow for a multi-channel experience?**
- **What does the final device look like?**

# Cardboard

## Rationale

After looking at the list of the questions, the team found it best to answer the question of judging the **size of the machine** because we felt like the size is the most crucial factor in purchasing a device for a customer's house. To do this, we found it best to use cardboards as sizes and dimensions could be easily represented through this medium.

## Details

We had 3 different ideas; however, Figure 3.1 was the idea that was appreciated the most by our users. Therefore, the rest have been mentioned in Appendix 1.0.

*Fig 3.1 The "breakfast machine" cardboard prototype*

- Considered the space and size requirement for a device that would be able to store different kinds of bread, spreads, and the toaster machinery itself.
- Storage section separated from the toasting section.
- Dimensions too big to be kept in the kitchen (used preferably for communal spaces).

## Testing and takeaways

*Figure 4.1. Users testing out the cardboard prototypes*

We tested the prototypes out with 5 users. Most of our users appreciated the breakfast machine idea (Cardboard ); this was an experience they connected with the most. The rest of the experiences were regarded as *"Good height, I don't like the width"* (P2) and *"This is almost like a regular toaster"* (P4).

Talking about Figure 3.1, most participants seemed to like the idea; however, P3 mentioned, *"The only reason I would want to have this is if I live in a hotel."* Therefore, keeping the size in mind, a communal space would be the most well suited.

Pitching the idea for a communal space machine to P4 and P5 sparked their interest who mentioned, *"If I have this in my apartment, I'd use this every day."* (P4). They later went on to say, *"Students are always in a hurry."*

Therefore due to the idea of Figure 3.1 echoing with most participants, the team decided on using this for a **communal space with the target audience being university students** (because they are usually in a hurry in the morning).

After this exercise, we had an idea of what we needed to move forward with; however, **questions regarding the features, the journey of customers while using this machine, and the multichannel approach** still remained unanswered.

# Paper Prototyping

## Rationale

To ideate on the multichannel experience and the features involved, the team came up with paper prototypes. Figure 5.1 represents the interface on the device, whereas figure 5.2 represents the features of the mobile app.

## Details

Consider two scenarios:

1. The user is in bed, and decides to place an order from the app itself; this saves them around 10-15mins, they then go to the machine and collect their order (figure 5.2).
2. The user forgets to place an order through their phone, they can simply go to the machine and use the display to place their order (figure 5.1).

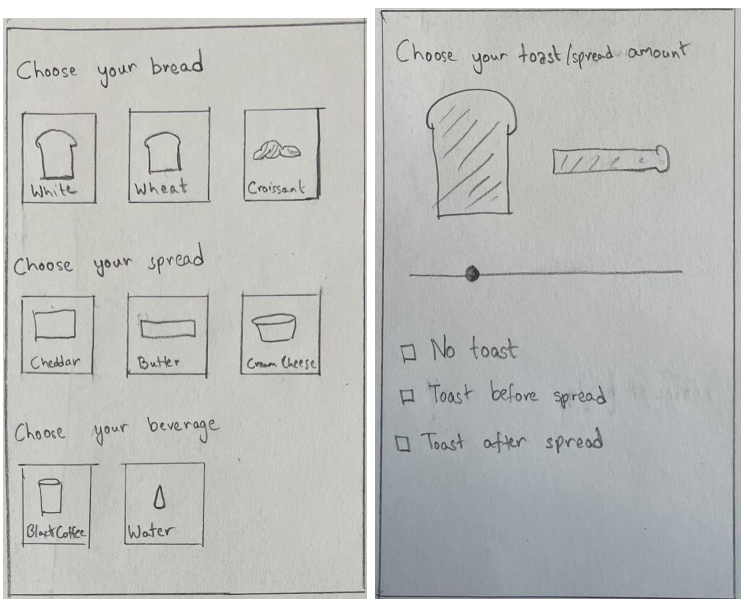



*Figure 5.1. Machine interface*

- User interaction with the screen on the device to place an order.
- Ability to visualize the amount of toast and spread.

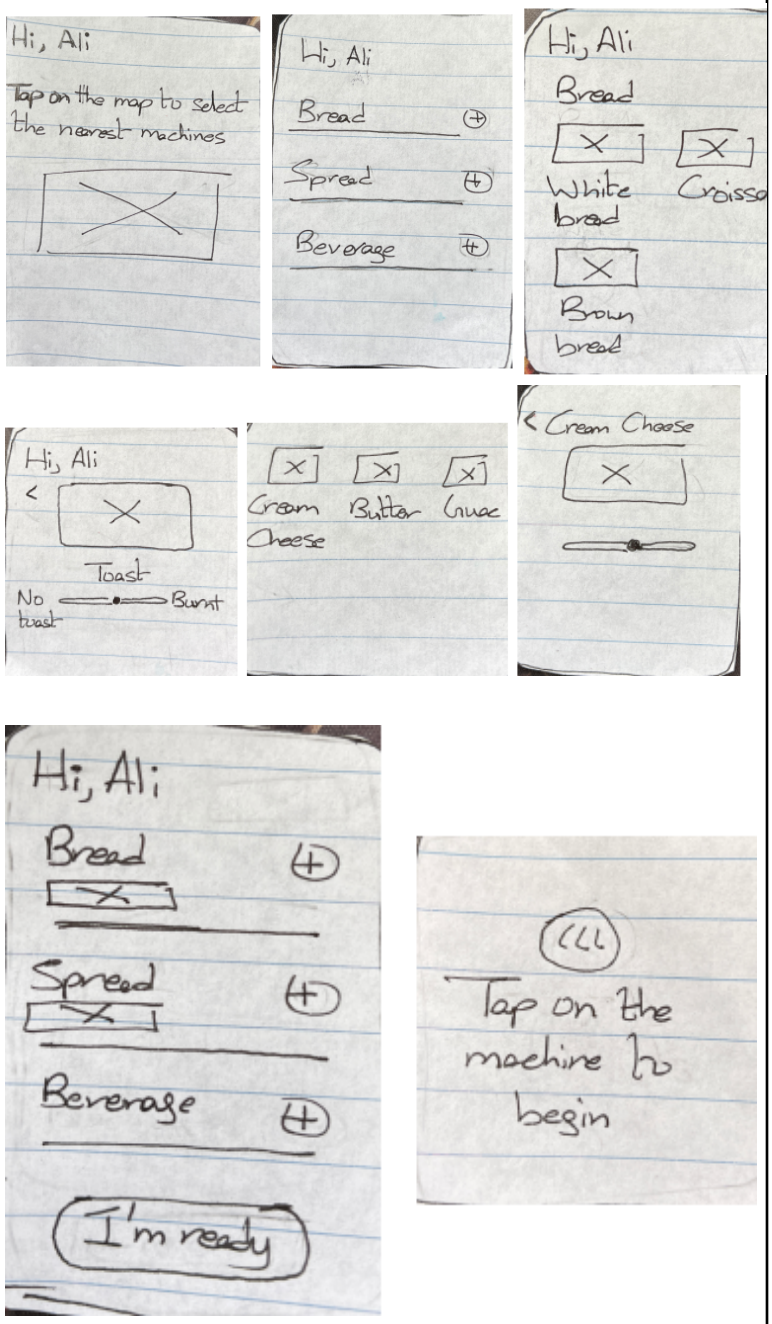



*Figure 5.2. Mobile interfaces.*

The following features are a part of the mobile interface:

- Tapping on the map to locate the nearest machine.
- Choosing the bread, spread, and beverage.
- Using the slider to select the amount of toast and the amount of bread.
- Real-time 3D visualization of the toast and spread as the user slides the slider.
- Pressing the I'm ready and the machine preparing the order for you.
- Them tapping on the machine when they are in the lobby.

## Testing and takeaways

*Figure 5.3. Testing both scenarios out with the users.*

After guerilla testing the paper prototype with both the scenarios, the team understood how the multichannel experience was an interesting take for the users; however, we still lacked an understanding of **what the device looked like.**

For this purpose, we decided to resort to Lego prototyping explained in detail in the section that follows.

# Lego Prototyping

## Rationale

After the testing with paper prototypes, we had a clear understanding of our idea of the device.  We had one final question left to answer. **What does the final device look like?**

## Details

We decided to use Legos to answer this question because of the rigidity of the Legos. The team used the takeaways from the previous sessions regarding the features, size, and functionality of this machine to help create this prototype.

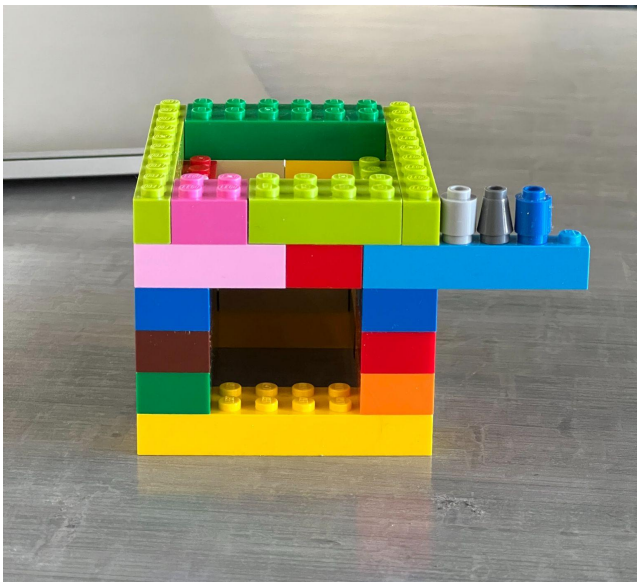


*Figure 6.1 Device on Lego*

## Takeaways

Some of the essential takeaways from the Lego prototype:

- **Determining the placement and size of the screen and delivery area on the device.**
- **Displaying the storage section, where the bread and spreads can be added.**
- **Show where the drinks would come out of.**

# Limitations

Our device does come with several limitations. We acknowledge that the storage of the items in the device is limited. As of now, we plan on including three different types of bread and spreads. The device also only serves medium brewed coffee and water. We initially wanted to add more options for each.  The quality of the food and beverages is also a concern when stored for a long time.

Another problem we didn't address through our prototyping process was where would the food be held after the preparation? This is an important issue, especially when there are multiple orders at the same.

Additionally, at times, the device would also be counterintuitive with lines forming near the machine; however, for this purpose, we have the option of storage. Moreover, the client i.e., the hotel or the apartment complex will have to bear the cost of the items.

# Conclusion

Through this project, the team was able to revamp the current breakfast experience for young college-going adults in the need to grab a quick bite before heading out to class.

The team experimented with several prototyping methods (paper, cardboard, lego, and clay) to further refine its design idea represented in a video.

For further questions feel free to reach out to any of us. Happy breakfast-ing!

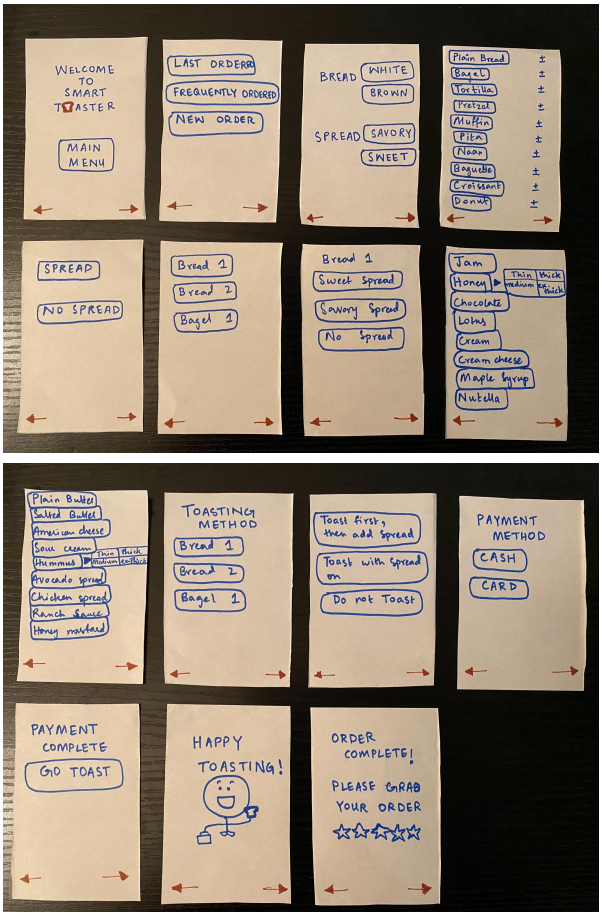
# Appendix

The sections in this appendix represent the annotated prototypes that were not used in the final design.

## 1.0 Other Cardboard Prototypes

| | |
|---|---|
| | • The toaster is small and portable and takes minimal kitchen space.<br>• It has enough space to toast both regular bread slices and larger bread-like baguettes (slots haven't been separated in this prototype as it was only meant to check and decide the overall size of the toaster). |
| | • A coffee machine attached on the side for a breakfast experience.<br>• Pieces of bread are loaded at the bottom.<br>• An invisible front screen to give ample visibility to the customers. |

## 2.0 Other Paper Prototypes




- The app saves the order history of the user (last ordered and frequently ordered).
- It has 2 options: bread (white and brown) and spread (savory and sweet). The +- signs can be clicked to add more items or reduce the number of items.
- The user has to select a spread for each of his chosen bread (unless he wants no spread on one or more chosen bread).
- All the spreads have 4 amount options - thin, medium, thick and extra thick.
- There are 3 toasting methods - 'Toast first then add spread', 'Toast with spread on', and 'Do not toast'.
- After selecting the payment method (card/cash) the user clicks on go toast once they're done paying.
- The app says 'Happy Toasting' and then lets the user know once the order is complete.
- It also shows 5 starts for the user to fill in for review!

## 3.0 Other Lego Prototypes

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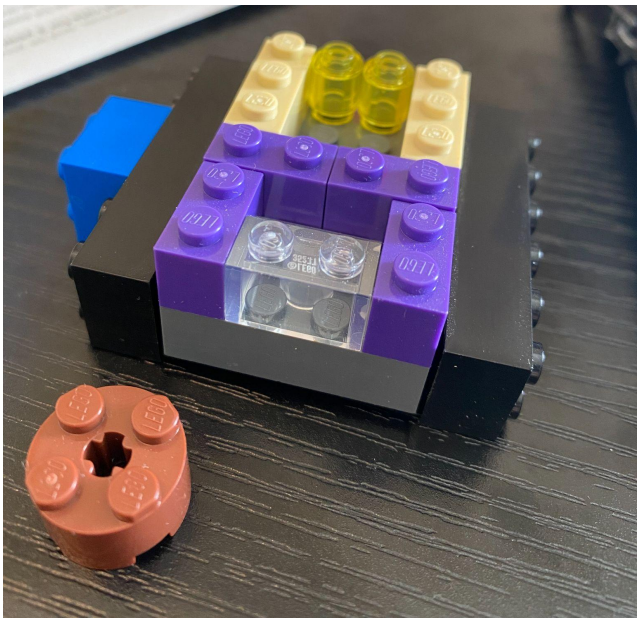
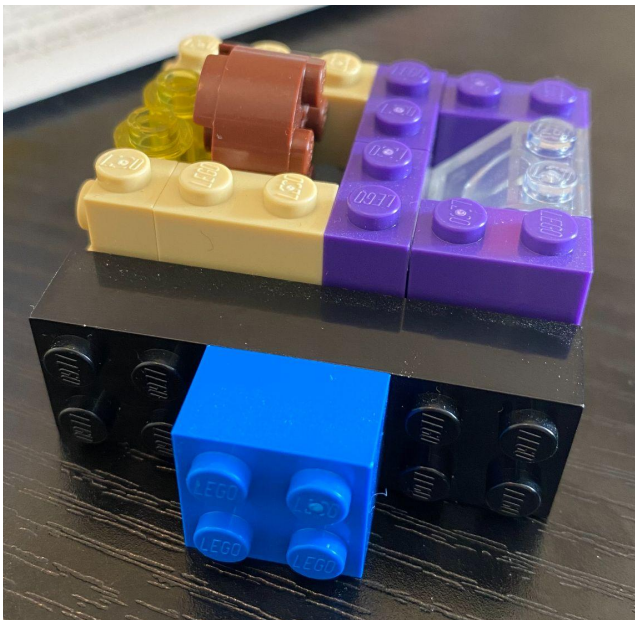
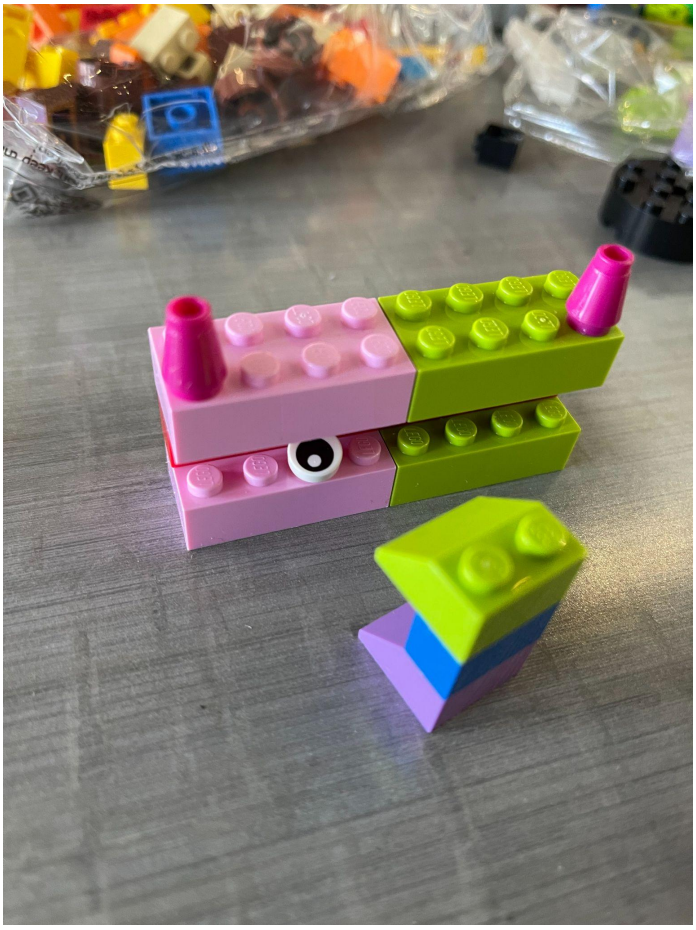
|  <br>  | • The toaster has 2 slots - one for regular bread and one for larger bread.<br>• There's a transparent screen to show the toast progress on the front and back (shown by the translucent legos).<br>• The brown lego shows a larger bread.<br>• There's a temperature control screen on the side (shown by the blue lego) which also sends a notification on the user's phone once the bread is ready. |

| | |
|---|---|
| | • Ability to drop extra spread through nozzles.<br>• Screen placement in the front.<br>• Storage option through the top. |
|  | • A visual representation of the size and relative dimensions of the machine.<br>• Two scanning points are shown in purple.<br>• The pink side represents the bread and spread area.<br>• The green side represents the beverage area.<br>• A person is also shown to judge the dimensions. |

## 4.0 Clay Prototypes

- There's a 'smart' screen in front which can be used to order (a phone app is also available).
- Once the order is ready, the toaster slides it out through the bottom in a tray.
- In this case the user has ordered a plain croissant, a regular bread slice with apple jam and a small baguette with cream cheese spread.

| | |
|---|---|
| | • Placement of adding bread to the machine through the top lid.<br>• Spreads go through the side tray storage option.<br>• Screen placement in the front. |
| <br> | • Scanning point dimensions considered.<br>• Three true-to-scale models were created and tested with users.<br>• The one in the middle was preferred out of all the sizes. |