



Report Bugged 2.0

The rise of Holdie

Thomas de Jong	s141385
Ben Muntinga	s147560
Seth Tekens	s145685
Erik Wubbels	s141160
Bert Lonsain	Coach



optimized for ipad

Table of contents

Table of contents	1
Vision	2
Brainstorming	3
Idea generation	4
Personality & co creation	5
Form study	6
Prototyping	7
Back to brainstorming	8
User testing	9
Evaluation	10
Final product	11
Appendix: Arduino code	12

Vision

Initially we found it hard to grasp the concept of the project Bugged 2.0. We sometimes struggled to create a vision that fits the project. We took heed of the feedback we got from the coaches in our space and came up with the following understanding of the project. We should bug an object without adding new functionality to it. It should maintain it's original purpose, while getting a character that people could bond and interact with.

Holdie

We decided to create a bugged pencilholder named Holdie. Holdie is long forgotten, covered in dust on your desk, overwhelmed by modern technology. While all he wants is to love, to be loved and to get a bit of attention every now and then. Therefore Holdie tries to connect and interact with people. He tries to get your attention and when he does feel love and affection, he gets this warm feeling from within and shows his love to you.

Brainstorming

Our initial approach was to divide our design process in three parts. We begin with idea generation and brainstorming. After that we started making prototypes and lastly we started testing and improving the ideas. After the prototyping and making phase we decided that we should brainstorm again, as we were not completely satisfied with our idea.

We used several brainstorm techniques. We started with making mindmaps and used this to find objects that we could 'bug'. Each of us would choose 3 objects and create a concept with those objects. After a while we did not have any inspiration any more so we created another mindmap. This time we looked for characteristics that we could match to the objects that we already found. We wrote these words on cards and would pick random cards with objects and random cards with characteristics. We would link these together and create a concept with this.

We found that we kept getting the same sort of ideas. The outcome was that the ideas were too random and still too "standard". Normal human characteristics were linked to different daily used objects. We saw that these often had nothing to do with the traits of the product itself.

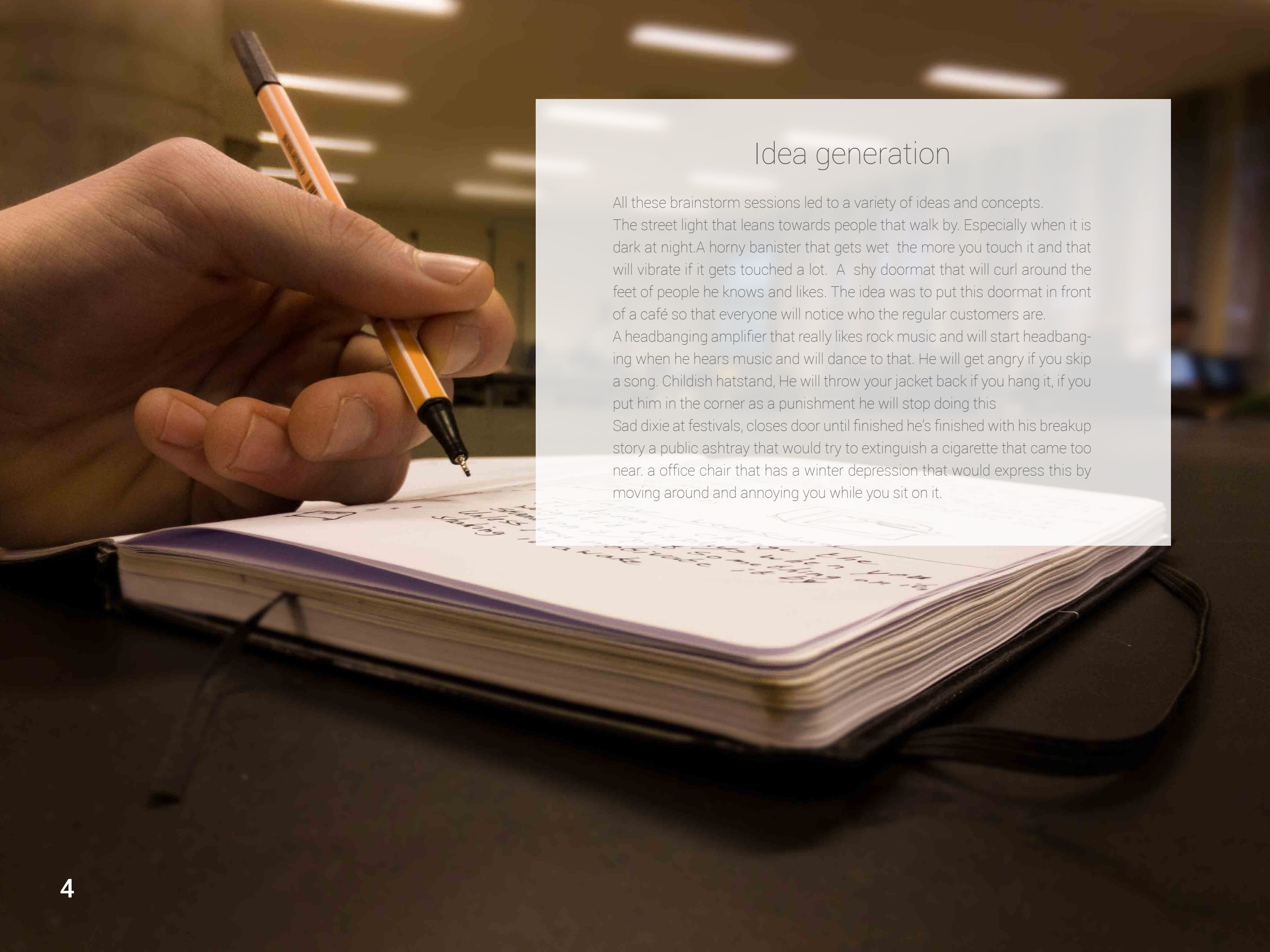
We decided to also add cards with animals on them since it is the goal of bugged to create a bond with the object and people always have a bond with their pet. This led to some new inspiration, however the ideas still did not have much to do with the product itself.

A new brainstorm technique we used were IDEO cards. This was a part of a DG000 assignment. These are cards which have different exercises on them to get new inspiration and help generate and develop ideas. We looked at where in public spaces people go a lot and which stuff people touch and interact with the most. This is how we came up with the idea to bug banisters.

Our coach suggested that we could narrow down our ideas by choosing a location for our object. The options were public spaces or personal (home). We chose to bug an object in a personal space, because then it is more likely that you will build a bond with the object.

Next, we also looked at different themes such as stress and addiction to create a better story for our object. Although this did lead to new ideas, the disadvantage was that all the ideas added a function such as causing people to quit smoking or to reduce stress.





Idea generation

All these brainstorm sessions led to a variety of ideas and concepts.

The street light that leans towards people that walk by. Especially when it is dark at night. A horny banister that gets wet the more you touch it and that will vibrate if it gets touched a lot. A shy doormat that will curl around the feet of people he knows and likes. The idea was to put this doormat in front of a café so that everyone will notice who the regular customers are.

A headbanging amplifier that really likes rock music and will start headbanging when he hears music and will dance to that. He will get angry if you skip a song. Childish hatstand, He will throw your jacket back if you hang it, if you put him in the corner as a punishment he will stop doing this.

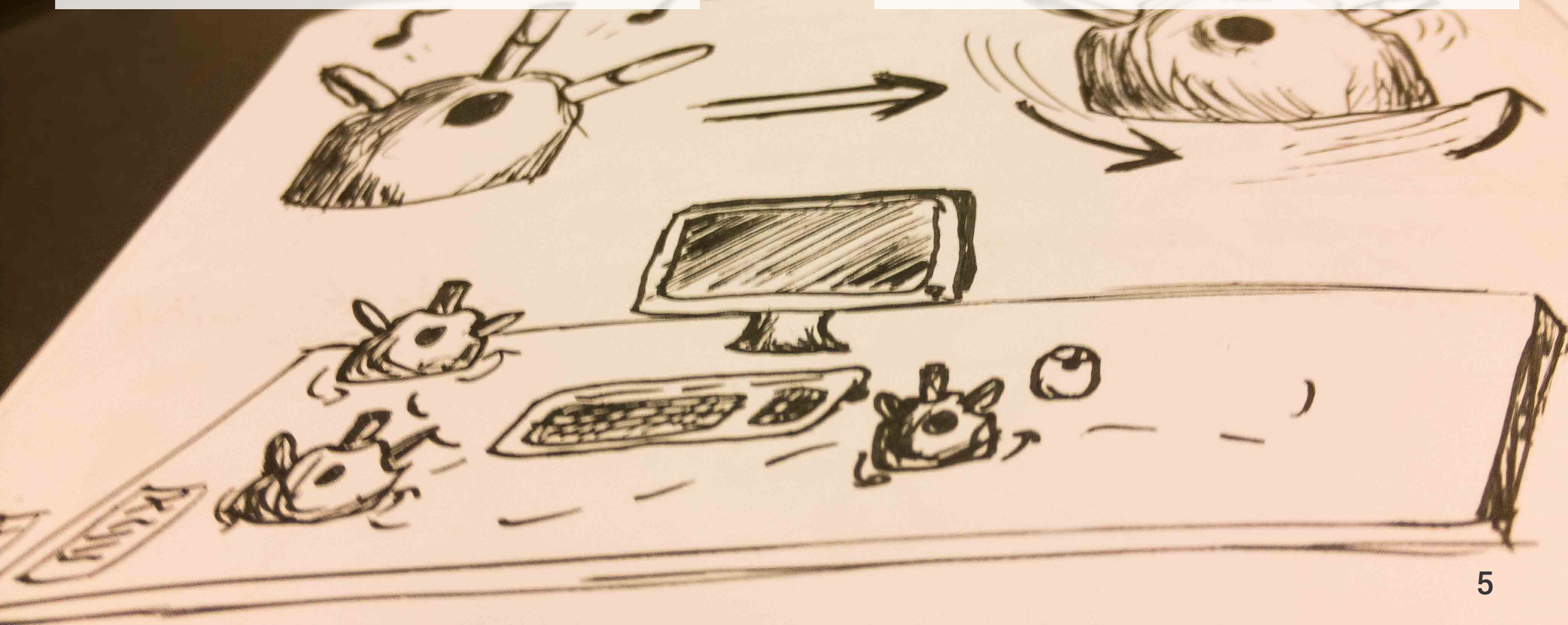
Sad dixe at festivals, closes door until finished he's finished with his breakup story a public ashtray that would try to extinguish a cigarette that came too near. a office chair that has a winter depression that would express this by moving around and annoying you while you sit on it.

Personality pencilholder

Eventually we came up with Holdie, a pencil holder that is forgotten, due to the rise of technology. Nobody uses Holdie anymore because they use computers, tablets or phones to write letters and even draw. This is why he wants to conquer the world, but first, he needs to start with the very desk he is standing on. The idea was to let the pencil holder drive around on your desk and tip over other objects on the desk, ride against them, shoot pens and make it a mess.

Co creation interviews

After we created the concept of Holdie we did cocreation interviews. The results were that people thought it would be amusing to watch how the pencilholder would drive around the desk. However they would not like to keep him since he would make a mess of their desk. During the session most people would try to search for the batteries or throw him away. We concluded that we should make Holdie more likeable. Another thing we found out during these interviews is that there was not much interaction between Holdie and the user. Therefore we looked at how we could create more interaction.





Form study

We started looking at which shapes would make him look the most powerful or empowered. We took the form of a tank, since the pencil holder would be aggressive and defensive and sketched out a few ideas. The round spheric shape suited best because we wanted it to look defensive, but still maintain the original look of a pencil holder. It was not the most normal pencil holder, but it was noticeable that it was a pencil holder.

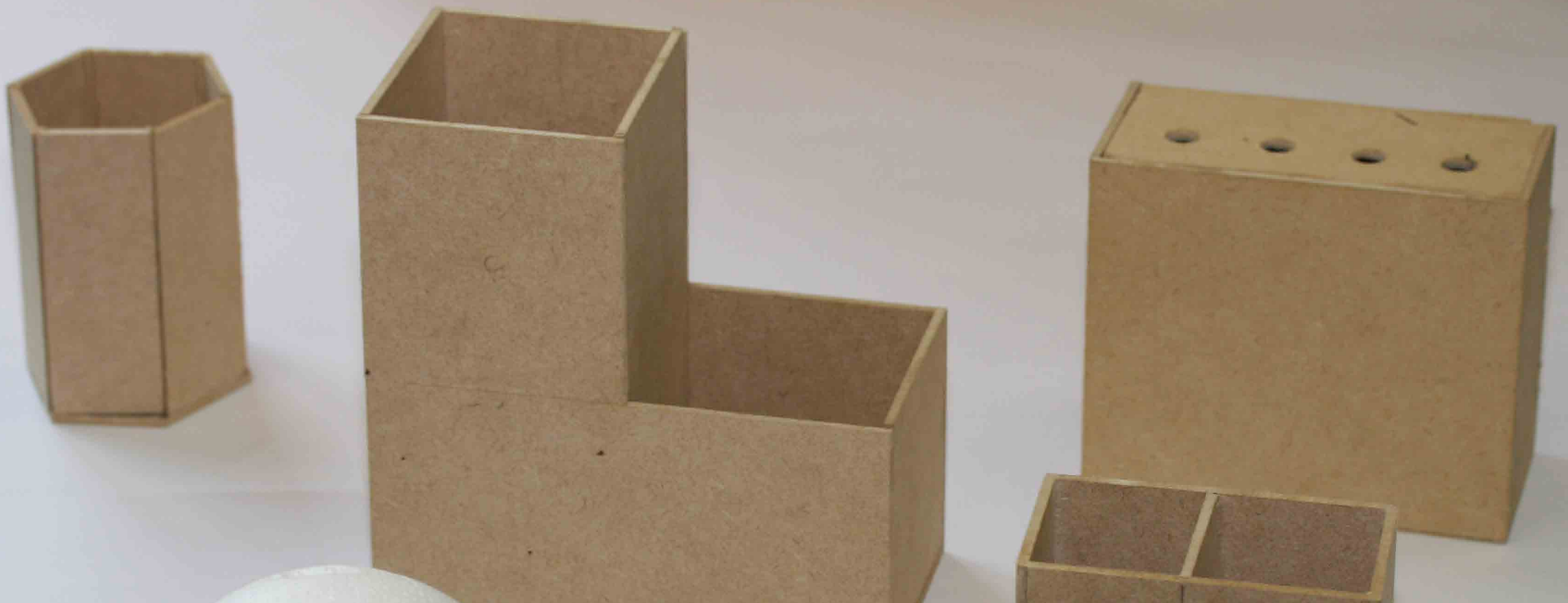
We made a simple prototype out of a modified RC car, that we put inside the pencil holder. At first we experimented with the RC car, we tried to modify it so it would drive the pencil holder. Initially, this gave us some problems with the antenna which we lengthened with a piece of copper, this greatly increased the range of reception for the RC car. To test if the form was the right

choice, we did some user tests.

We made the conclusion that the pencil holder did not look like a normal pencil holder enough, which was contradictory to the fact that in the project "Bugged", the object needs to look like a normal object.

The next thing we tried was making a pencil holder that would fire its pencils as a form of challenging the user to play with them. We developed a system that would release a tightened spring that would propel the pencil forward. In this design we also integrated a Servomotor to make it move slightly to the left and right as a way of letting it 'look around'.

Besides these two prototypes, we made a few more. These were pencil holders that looked as standard as possible. This way we could ask users to point out the most normal pencil holder in their eyes. On the mid-term demo day we found out that the most normal pencil holder would be a squared box with compartments of different height. Also most people did not find Holdie nice enough to keep him. The users said that they would search for the batteries or throw it away. This was not the reaction we were looking for.



Prototyping

We started prototyping our new idea and form of Holdie, where he is friendly and loving.

The object had to be similar to the normal pencil holder, while it was nice to hold it. Edges were eliminated on the side where you hold the holder. With foam, we made a quick prototype to test if it was nice enough to hold. After that, we tried making it with balsa wood and maquette plastic. This consumed a lot of time and our coach came with a better idea. He recommended us to use a vacuum shaper. We made a mould out of foam and melted the vivid plastic around it. Now, we got the outer sides, also the inner parts where made of vivid, which could be shaped easily by melting the ribs.

The pencil holder was now transparent, while we wanted it not to stand out too much. We painted it black and the outer

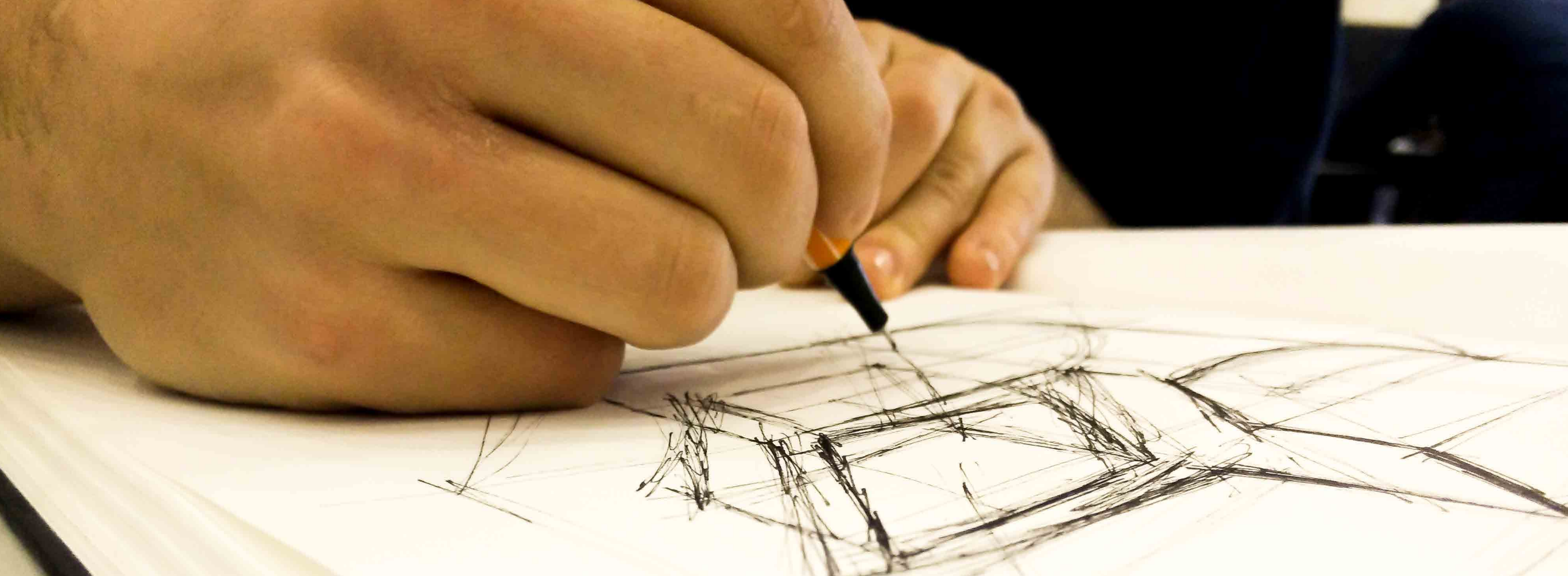
side did not come out well. We decided to glue on a second layer around Holdie. This was not the best idea, since the whole pencil holder was torn apart when the glue dried.

This was a week before the final demo day, so we had to make another prototype real fast. Seth, Erik and Thomas went over to Vertigo to start building, meanwhile Ben was making the pencil holder in Solid Works, so we could eventually 3D print it.

This last prototype we made in Vertigo was made of Balsa wood and maquette plastic. We used Glassex to bend the balsa and we used the old prototype (the one that was defect) as a mould to keep the balsa in place while drying. The plastic was cut out and after the outer parts were in place, a second outer layer was glued on it with aluminium

foil between the two layers, which would later serve as the CAP-sensor.

The team decided to let the digital Holdie get 3D printed and it came out perfect. We chose the blue colour because it relates to "feeling blue". Just like Holdie is feeling blue.

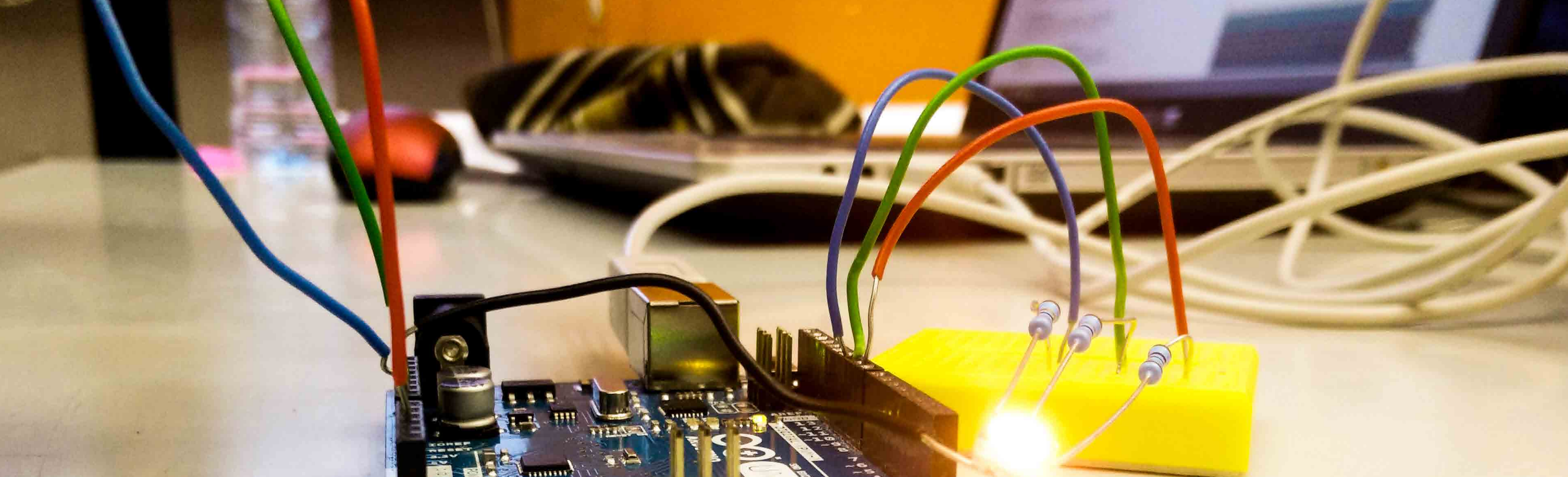


Back to brainstorming

After the Mid-term demo-day, the team decided to come up with some more concepts due to the disadvantages of the pencil holder. Pencil holders look buggy very fast, because a pencil holder does not have many different looks and shapes. A pencil holder is also a very small object, which makes it hard to integrate technology. An Arduino is a pretty big piece of technology to put in your prototypes. Another problem was that some of us were not very enthusiastic about the object, because they never use it themselves.

We Came up with an asthmatic ashtray and an interactive coat hanger. But after some discussions we decided not to use the ashtray, because also this object was too small to integrate technology.

We didn't choose the interactive coat hanger either, since our coach gave us the recommendation to continue with the pencil holder. The process of Holdie was way more developed than the one of the coat hanger. We felt that we already had a better character development with the penholder. Therefore we eventually stucked with the pencil holder



User testing

We made a setup with an RGB led and a potentiometer, using a microcontroller. On top of the led we placed a empty white soup cup in such a way that the light comes from underneath. By turning the potentiometer the light color changed. We showed the participants different light colors (red, orange, yellow, green, purple, turquoise, blue and pink) and asked them what feeling the color gives them, what temperature a product would have if the colored light would come from underneath and if they would touch a product that has the colored light.

The red light is associated with irritation, anger and bustle. The participants thought that a product with this kind of light color would be very hot, even so hot that you would burn your fingers if you touch it. That is also the reason why the participants would not touch or hold a product with the red light color.

Orange reminds the participants to a warm summer evening, a nice peaceful worry free feeling. The temperature of a

product that has this light color would feel nice warm, just above body warmth, according to the participants. Some participants would touch a product with this light color.

The participants saw yellow as a neutral light color. Also the temperature was seen as normal, not hot and not cold. About half of the people would touch an item with this light color, the other half would not touch it.

The green and the purple light colors gave ambiguous answers. Some participants saw the green color as calm, positive color. Others saw it as a toxic, agitated color. The temperature that a product with this light would have was according to the participants around normal room temperature. Some would touch it, others won't.

The purple color was by some participants associated with freshness, stylish and pleasant. Others associated it with stress, nightclubs and jealousy. Some thought the temperature would be extremely cold, other thought it would be average. About half of the participants would touch a product with such a light color, the other half won't.

Turquoise was seen as a very positive, peaceful color. The

participants said that it gives them the feeling that everything is alright, a relaxed feeling. The temperature was estimated as nice cold, like metal in a normal environment. Most of the participants would touch or hold the item.

When showing the blue color, the participants thought that a product with this color would be lonely, sad and solitary. "Feeling Blue" some said. They thought that a product with this color would feel cold, like a cold night. Most of the participants would touch an item with this color.

The pink color is associated different by the male and female participants. The male participants associated it with love, porn and sex. The female participants associated it with calm and peaceful, femininity and attention. They thought the temperature of a product with this light would be normal room temperature. Most won't touch it.

Orange is the colour that was decided on because it emitted a warm feeling that fits the vision we had for the personality of Holdie.



Evaluation

We often got stuck in the brainstorm phase, because we were too critical. We tried to come up with the perfect product, just by brainstorming. Now we know, this is not the ideal way to do this. A better way is to think of a product, build a prototype, and do users tests with it. This way you generate great ideas just by making a prototype. You see the mischiefs of your product. Another important thing is that when you have created a product you can do user tests with it, which are very important. User tests help you see whether the concept you have created actually works out the way you planned and you can see how people react on your product. Unfortunately we did not have a lot of time for user tests due to the long brainstorming phase.

It is important to be able to show the visualisation of your process to your potential client. This is something we did not do enough. We should have made more pictures of our process, of our prototypes and our user-tests. More sketches would be an improvement too, this would visualize our future concepts and ideas to each other, but also the potential client.

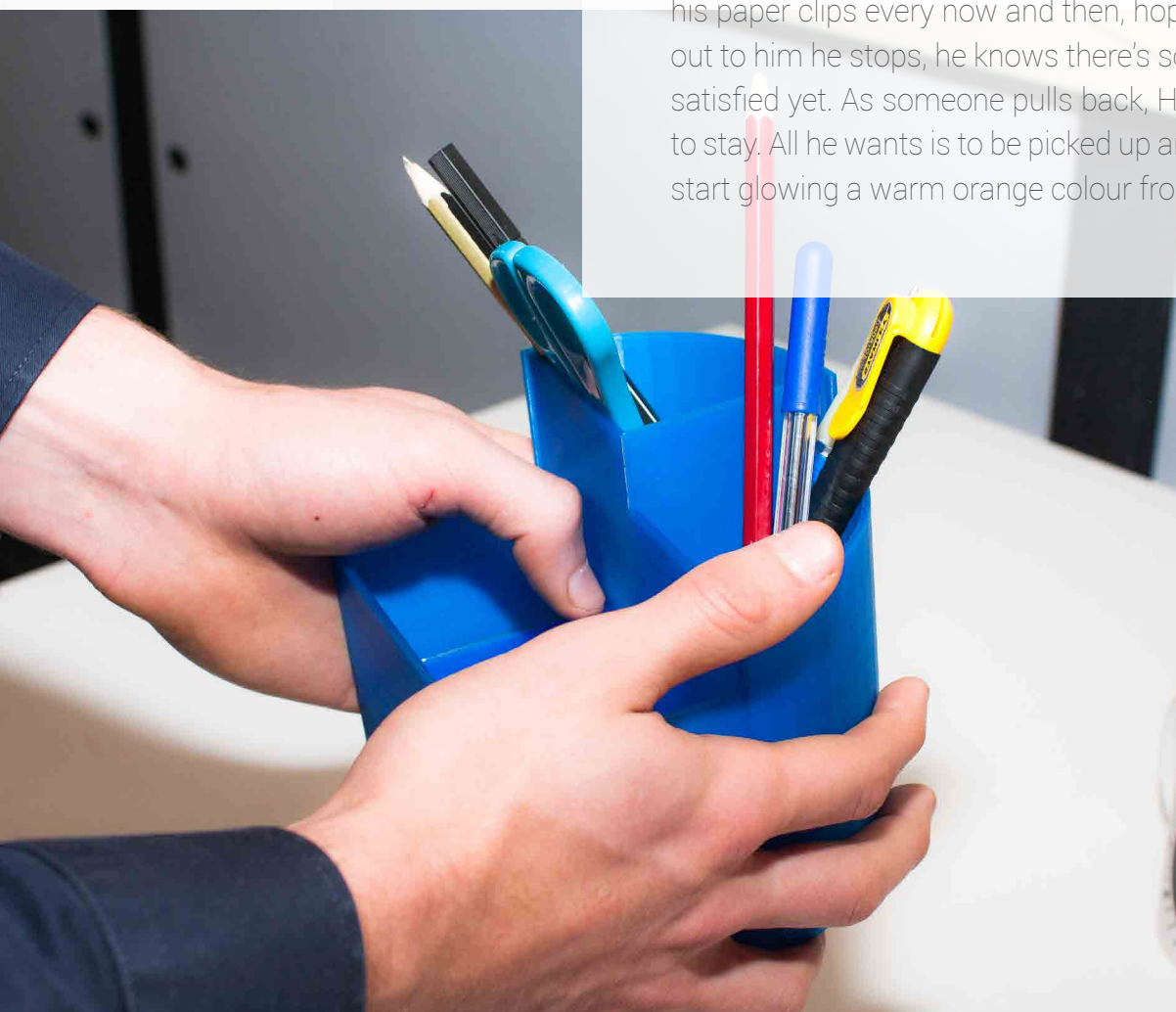
In the beginning we did not have a great division of tasks, this was slowing us down in the design process. We were doing everything together and that way also double. After we did set tasks, everything was organized more sufficiently. Seth and Thomas did the prototyping and form study, Erik did the Technology and Ben made Holdie in Solid works and did user tests.

If something had to be created with an adobe program we naturally picked Ben since he has the most experience with these programs. But when we created a poster for the mid-demo days it would have been better if everyone had tried to create a poster so that we would have had a bigger variety of ideas. These ideas could be integrated into one poster, made by Ben since he is most experienced in Adobe programs. This taught us that even though one person is best in one particular skill, it is sometimes better to let everyone think about the design to create a higher variety of ideas.



Final product

For the demo day and the final product we had a pencil holder made with 3D-printing. It was decided to use a blue colour to reflect the 'blue feeling' the pencil holder is experiencing. In this we integrated an Arduino for the interaction with the user. Using two rgb LEDs a vibration motor and a few sensors it responded to people coming close to it and picking it up. Holdie is standing on his desk shaking his paper clips every now and then, hoping to be heard. Once someone reaches out to him he stops, he knows there's someone giving him attention. But he isn't satisfied yet. As someone pulls back, Holdie starts shaking again wanting them to stay. All he wants is to be picked up and loved, and as soon as this happens he start glowing a warm orange colour from inside. Now Holdie is content.



Appendix: Arduino Code

```
//INPUT = LDR
int ldrPin = 0;
int ldrVal = 0;

//OUTPUT = PWM Pins
int redPin = 9;
int grnPin = 10;
int bluPin = 11;

//Variables
double redVal = 255;
double grnVal = 98;
double bluVal = 0;

int steps = 70;
int increase = false;

//Changes
double redChange = ((double)255 / steps);
double grnChange = ((double)98 / steps);

int DEBUG = 1;

int vibrationMotor = 3;

#include <CapacitiveSensor.h>

CapacitiveSensor cs_4_2 = CapacitiveSensor(4,2); // 10M resistor between pins 4 & 2,
pin 2 is sensor pin, add a wire and or foil if desired

void setup()
{
  pinMode(redPin, OUTPUT);
  pinMode(grnPin, OUTPUT);
  pinMode(bluPin, OUTPUT);
  pinMode(vibrationMotor, OUTPUT);

  cs_4_2.set_CS_Autocal_Millis(0xFFFFFFFF); // turn off autocalibrate on channel 1 - just
```

```
as an example
  Serial.begin(9600);
}

void loop()
{
  ldrVal = analogRead(ldrPin);
  long start = millis();
  long total1 = cs_4_2.capacitiveSensor(30);
  if(total1 < 100){
    digitalWrite(vibrationMotor, HIGH);
    delay(150);
    digitalWrite(vibrationMotor, LOW);
    delay(1000);
    analogWrite(redPin, 0);
    analogWrite(grnPin, 0);
    analogWrite(bluPin, 0);}
    else if(ldrVal > 5){
      if ((redVal <= 0 || redVal >= 255) || (grnVal <= 0)) {
        redChange = -redChange;
        grnChange = -grnChange;
      }
      redVal += redChange;
      grnVal += grnChange;
      analogWrite(redPin, redVal);
      analogWrite(grnPin, grnVal);
      analogWrite(bluPin, bluVal);
    }
  else {
    analogWrite(redPin, 0);
    analogWrite(grnPin, 0);
    analogWrite(bluPin, 0);
    digitalWrite(vibrationMotor, LOW);}
  Serial.print(total1); // check on performance in milliseconds
  Serial.print("\t"); // tab character for debug window spacing
  Serial.println(ldrVal); // print sensor output 1
}
```