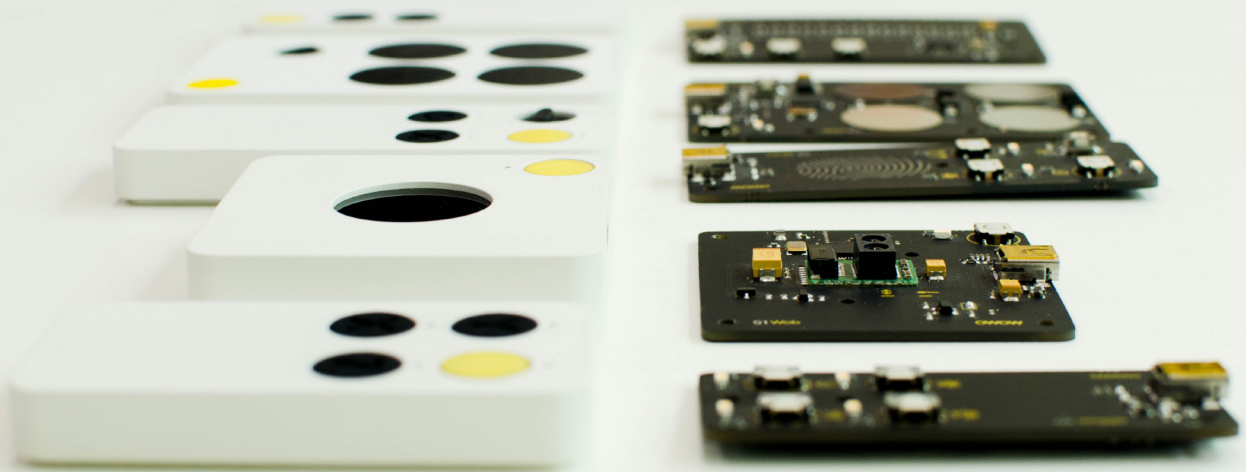


OWOW

Internship



Bas Bakx

s123612

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Objective

"OWOW, the Omnipresent World Of Wizards, is a design company which focusses on design, technology and engineering. We develop our own range of products, and do projects for and with brands we love. Just so you know. Thanks."

-OWOW.io

This semester I did an Internship at OWOW, a small design company. Despite their relatively small size they do impressive projects for diverse clients. OWOW combines creative design work with creating strong brand identities. It's hard to say what the main business is, but work for clients allows them to work on their own elaborate products. Like a

series of new MIDI instruments that will launch on Kickstarter ¹ this June.

My goal was to be able to both expand my own vision and process, and to be able to profit from a large network and experience. Besides this I also wanted to be a valuable member of a team. The prospect of being able to provide a valuable service to a real company motivated me.

OWOW is run by Pieter-Jan Pieters and Robin Dohmen, both of who I worked with closely. Alex Tsamakos is a full-time programmer and Iosif Macesanu part-time. They both helped me out massively with the code.

¹ www.kickstarter.com, a crowdfunding platform

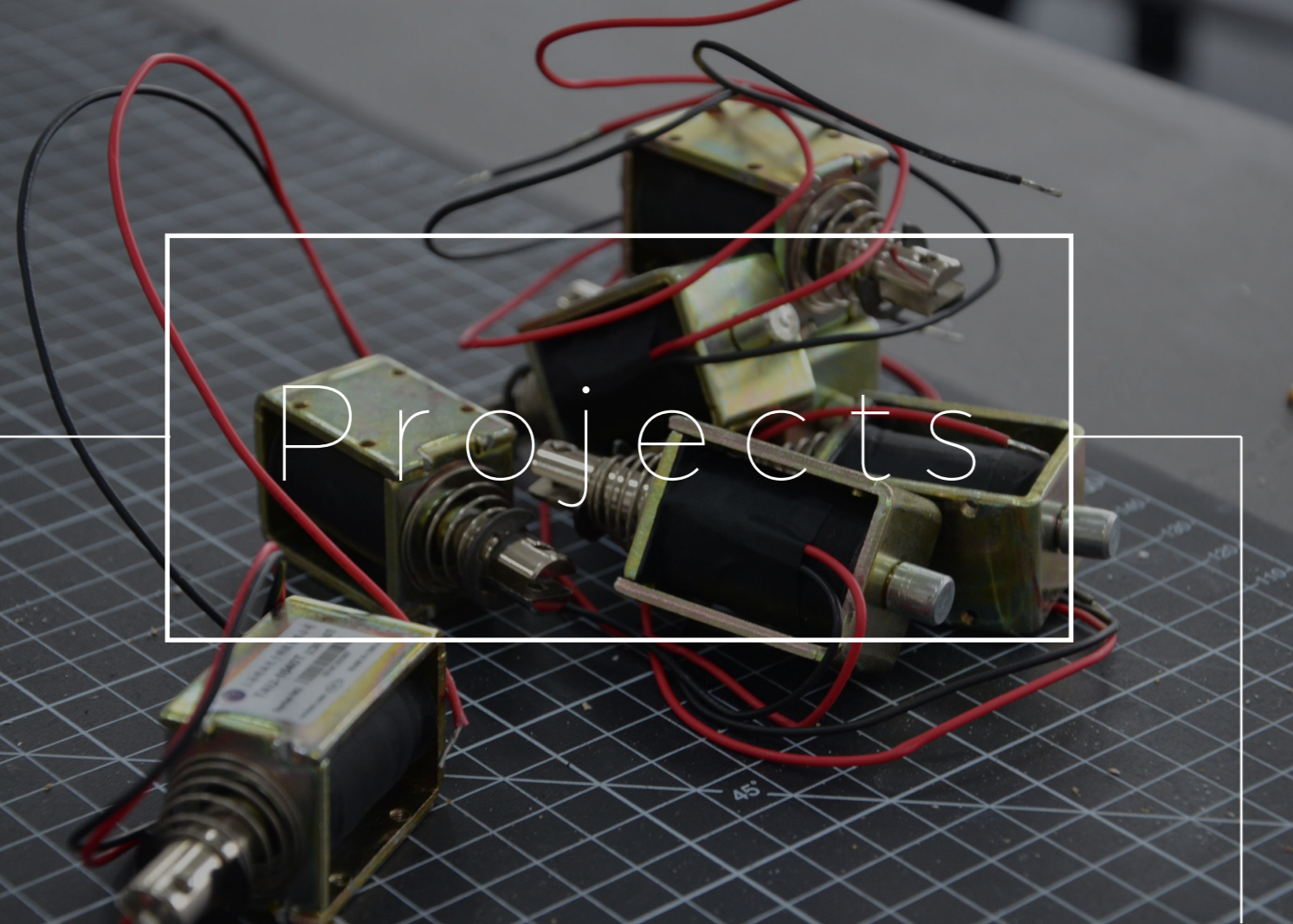


Pieter-Jan, my company coach



The OWOW office

Projects



Human Decoder

The biggest project I worked on in my time at OWOW was actually does not have a name, but for lack of anything better we called it the “Human Decoder”. It started out as a project for the Dutch festival Lowlands¹, but grew into something entirely different. Originally Lowlands asked Jelle Mastenbroek ²to make an interactive installation based on a project he did before involving currency. Instead of hard cur-

rency, which not many people will have with them in a festival, Jelle had the idea to involve bankcards. To work on the digital element of the project Jelle and OWOW teamed up. Right at that moment I started at OWOW, so I got to work on the project.

The Human Decoder aims to collect data to convert into music and keep track of the value of the data. It is designed to shock and go just over the edge. By just clicking “yes” and “paying” with your data it’s able to process the data to music, but it can also show the monetary value of it that you may not be aware of.

¹ www.lowlands.nl
² www.jellemastenbroek.nl

At OWOW I got to work on different projects, several small ones where I was able to help out at different levels and some bigger ones where I also got the chance to take the lead and work together with companies outside OWOW. I got to help out with projects at all levels of development and in that way got a great cross-section of work in an independent design firm.

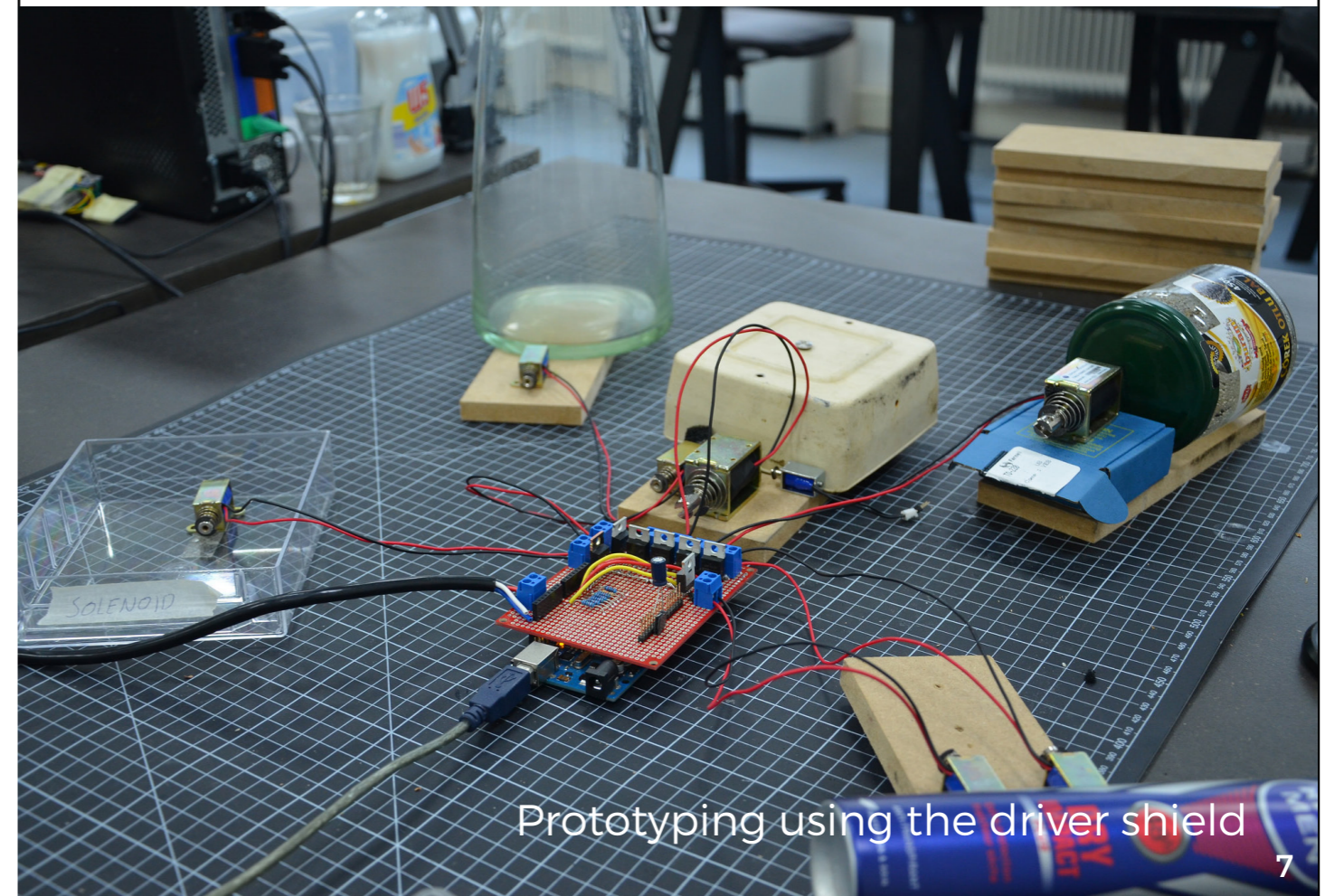
I’ve described the bigger projects I worked on at OWOW, they provide a nice cross-section of my work at the design firm.

The projects described are:

The Human Decoder, a project that aims to raise awareness over the value of personal data and converts it into music.

Facturis, a daughter company of facturis. Together with Pieter-jan I made their website, always staying in contact with them.

Heineken, I helped create mock-ups for a “smart-bottle”. So the idea could be pitched to Heineken for a long-term plan.



Prototyping using the driver shield

Design

When I started the project there was already an idea to use solenoids to have objects create sound. The entire package should be scalable from a single table with a glass box over it to a glass sea container. It should still maintain a consistent style at all sizes, so it is recognizable and part of a strong visual identity. I started out at the table size, keeping in mind that every part should also work in a larger size.

First Prototype

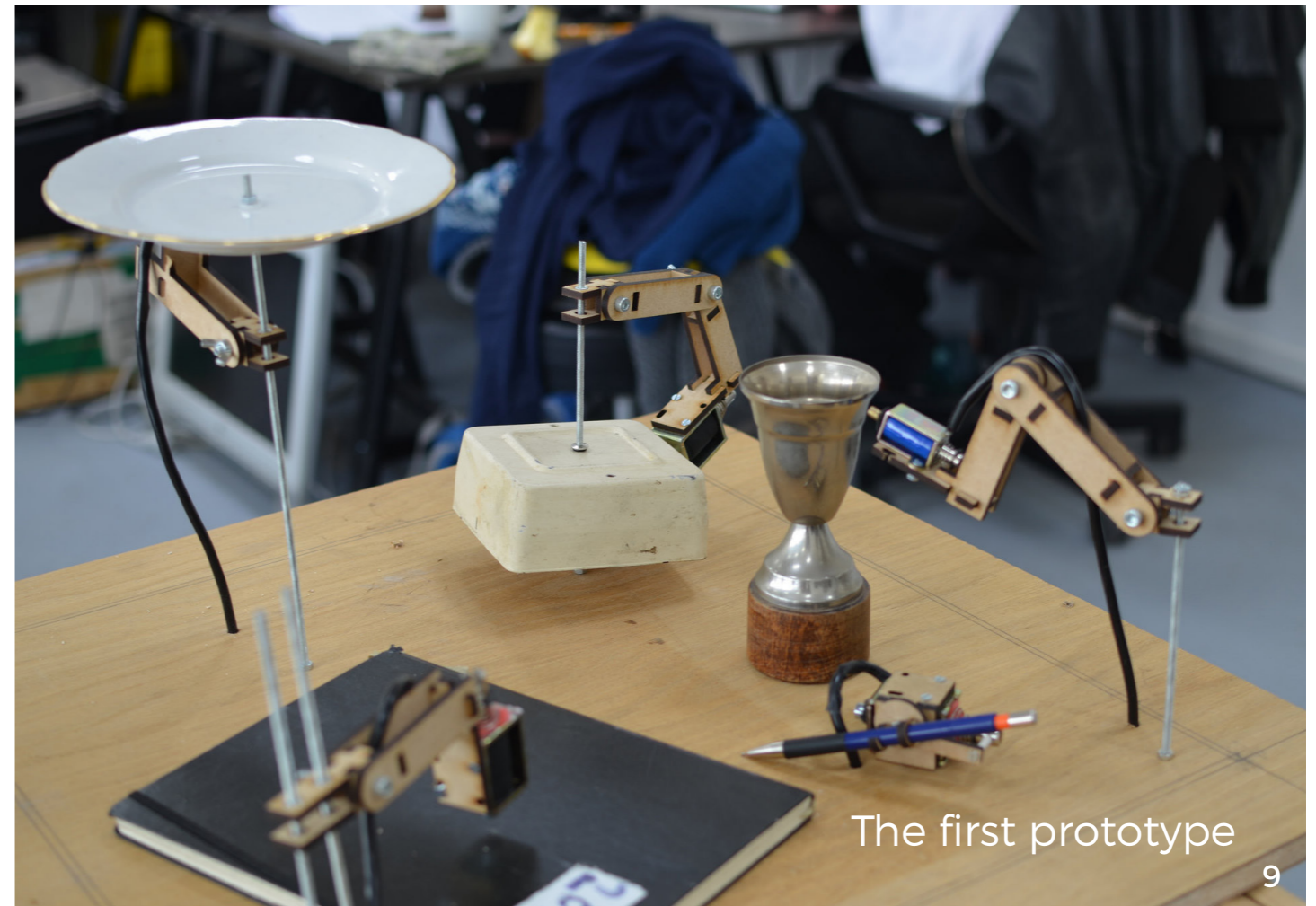
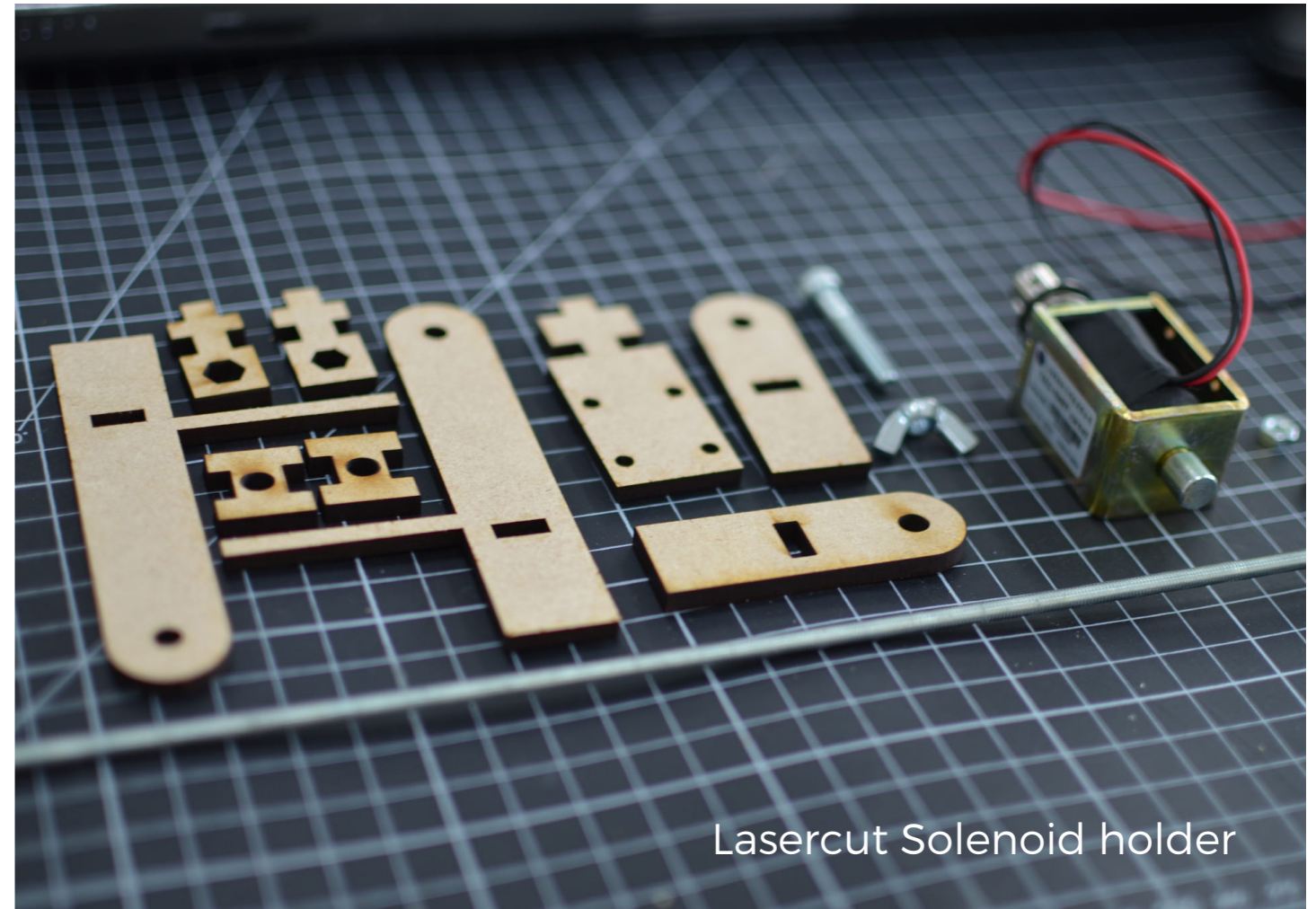
The objective of the first prototype was not yet to attain to all requirements of the project, but simply to create a working version of the initial idea. Getting to physically work on it allowed us to quickly visualize and make decisions for later versions of the concept. I wanted to have a working but developed prototype quickly as to illustrate an idea that is hard to explain, but I know to have a lot of potential.

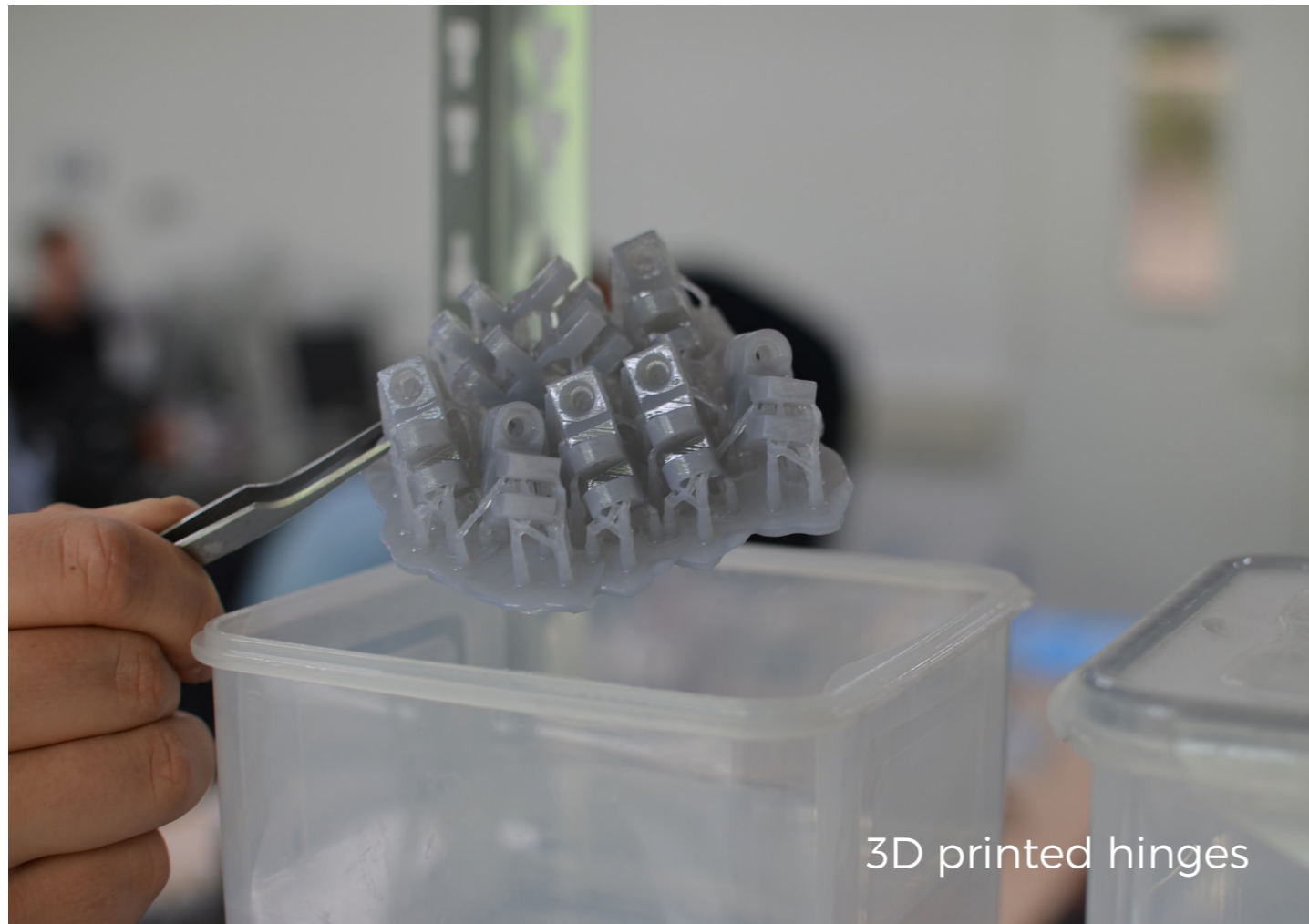
To optimize the sound both the solenoids and the objects should be suspended above a table. I used long

threads to achieve this, objects got small holes in them and on the same thread the solenoids were suspended using laser cut MDF arms.

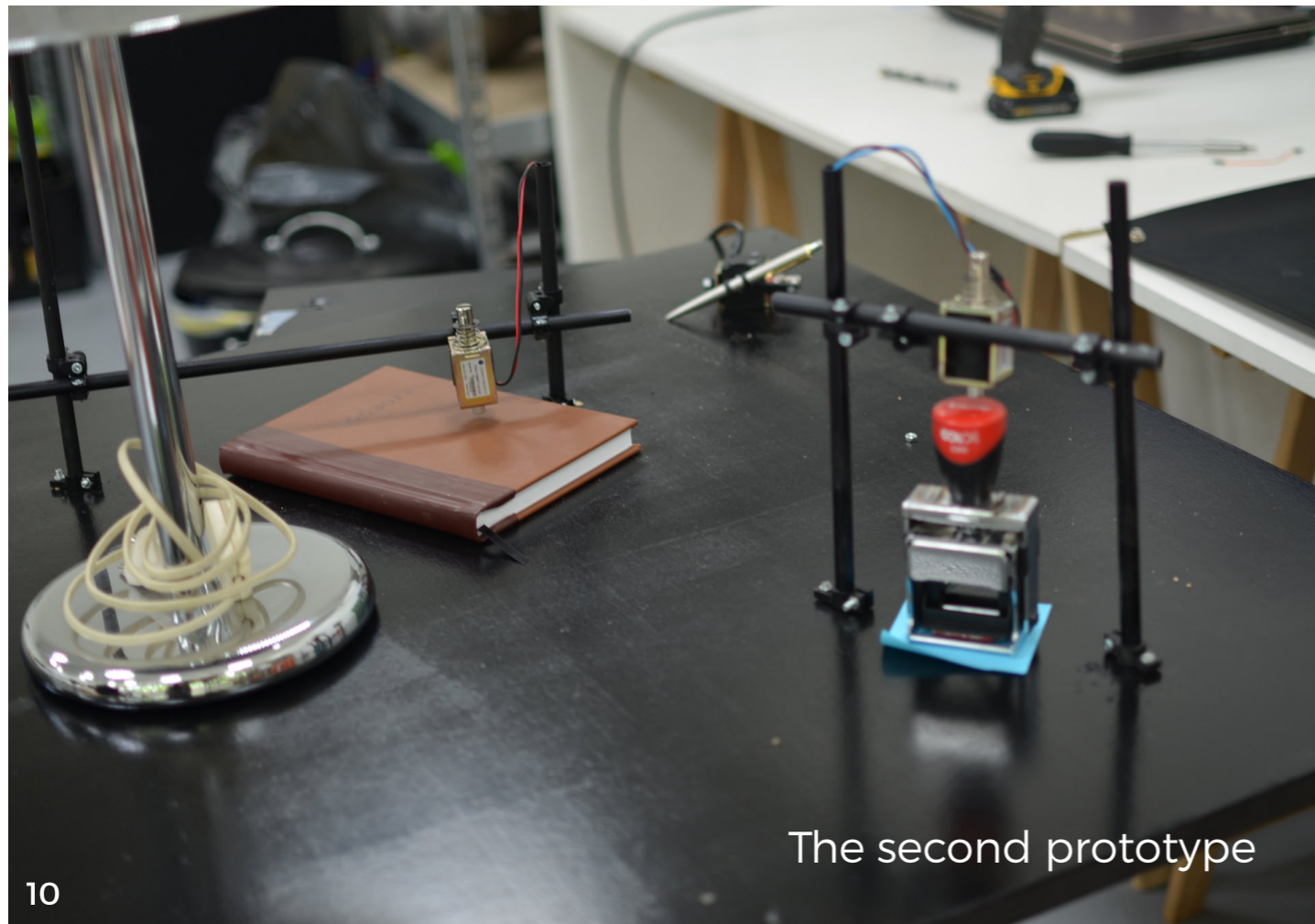
I tried various objects from around the office and picked some to include on the first table. Various objects required various lengths of arms, but I tried to keep it as uniform as possible, even though it became clear quickly that this wasn't going to be the final style of the machine. I also designed a different kind of holder that taps a pen back and forth.

All arms were fit into a big glass box to pull it all together. At this point all solenoids were controlled by a music program on the computer, not yet credit card information, but seeing the machine in full blast allowed me to already think about what's important. For example I could figure out what is important to actually create a composed song and not a random mess of pings and bumps, there is a fine line. But also what objects need a more reinforced arm, most of the bass notes have to hit very hard and therefore need stronger arms to not push themselves away or decrease the volume.





3D printed hinges



The second prototype

Second Prototype

The second prototype was a complete redesign of the first one. The MDF arms were much too impactful around both the objects and the solenoids, taking a lot of eyes off what is actually important about the decoder. Besides the fact that they were obtrusive, the MDF also did not provide much strength for the harder hitting solenoids. Moreover all arms have to be made more or less custom for every object, causing it to be hard to switch objects out if the installation is at a different place with different objects.

I set out to create a lower key, stronger and universal system for the human decoder. The weak MDF was going to be replaced with metal tubes, attached to each other using small clamps. There were no clamps that were perfect for the application and most certainly none that would scale to bigger sizes sustainably. Therefore I decided to 3d print them, after a few iterations I decided on two small clamps that attach to each other and the tubes, providing near infinite adjustability to the solenoids while remaining sturdy enough to handle the impacts of the hits.

In the end the OWOW Universal System was born. Consisting out of 10mm diameter aluminium tubes, two types of 3d printed clamps and 4mm wire thread with bolts, the system is a simple solution to mount the solenoids. All parts are painted black (eventually anodized)

to not try to conceal them, because the Human Decoder is all about seeing what is happening, but to pull the objects and solenoids to the foreground. The tubes also provide a medium for the cables to run through without obstructing any of the view.

Together with Jelle and Pieter-Jan, we investigated how the table itself should look. It should contrast with the modern look of the universal system and solenoids, making them two separate things. There is a nice décor that fits the place it is in with a contrasting system that provides an experience, universal to any location. We decided on a classic notary's desk, and picked out several objects that have a place on it. The objects are also specifically selected on their musical qualities, exclusively glasses, lamps and metal objects will only produce high pitched sounds. Bass notes, long ringing notes, quick tapping sounds, they all contribute to a richer musical experience.

Technology

When I started on the project luckily I had some notion of how to use solenoids using an Arduino and how to use MIDI with an Arduino. Expanding and implementing this knowledge was the first thing I had to do. After which I used several other technologies, detailed below.

First prototype

I started out with driving a single solenoid. I knew I would be using an Arduino¹ (<http://www.arduino.cc/>) to control them and since an Arduino would be far too weak to drive a solenoid, let alone multiple, I would need to come up with a nice circuit. I used a pretty well-known circuit² using IRF520N transistors to switch the solenoids. Since the solenoids at my disposal were 24v, I procured a big 24v power-supply with enough capacity to drive 8 solenoids.

First I tested out the circuit on a breadboard with 3 solenoids, driven by simple Arduino code. When this worked, I designed and build an Arduino shield capable of driving 8 solenoids. The shield featured screw terminals to easily connect the power supply and solenoids to it and plugged right into the Arduino.

¹ www.arduino.cc
² www.bildr.org/2012/03/rfp30n06le-arduino/

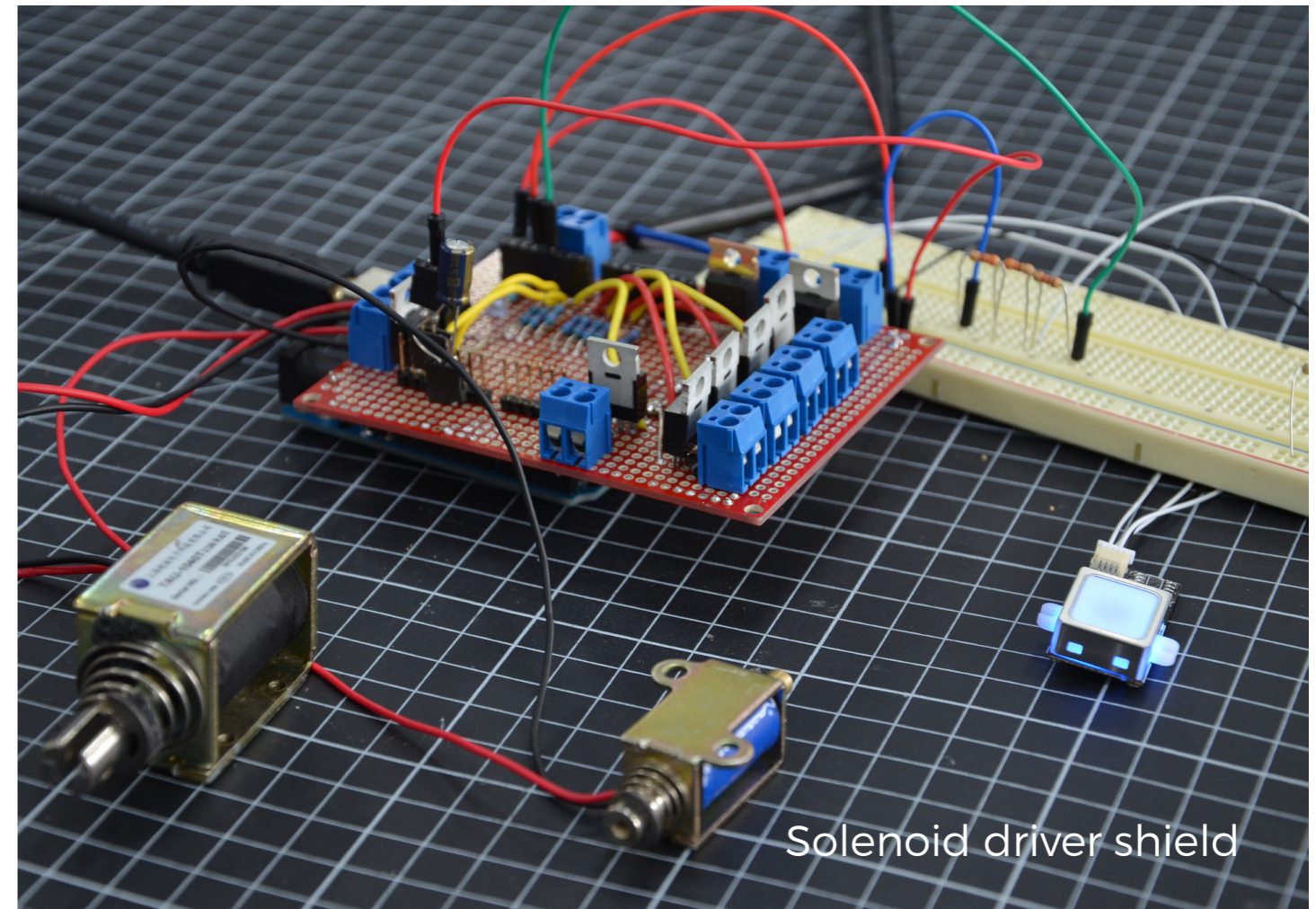
When the solenoids worked I got to work on code that would drive the solenoids using MIDI from a computer music program. Eventually I used the Arduino in tandem with hairless-midi³ and loopMIDI⁴ When this worked right it allowed for some interesting experimenting and eventually a video to show the project and get feedback.

³ <http://projectgus.github.io/hairless-midiserial/>
⁴ <http://www.tobias-erichsen.de/software/loopmidi.html>

Second Prototype

At this point the prototype ran from beats made on a computer, while this is fun, it doesn't represent the actual idea for the Human Decoder. I got a hold of a magnet strip reader, which simply spits out numbers of either bank-numbers or whatever is stored on the card at hand. I wrote code (appendix) that converts the retrieved number into an unsigned 16bit integer and uses it as a seed to generate a sequence based on the input number.

The sequence is generated based on an interval which is also specific to the input number, so every song has its own rhythm, density and sequence. The result of this sounded a bit too random and unrecognisable to my liking, to counter this the code now first gener-



Solenoid driver shield



Prototype being driver by music software

ates a short loop using two of the solenoids which it plays repeatedly while playing a longer sequence using the rest of the solenoids over it. This created a much more composed loop

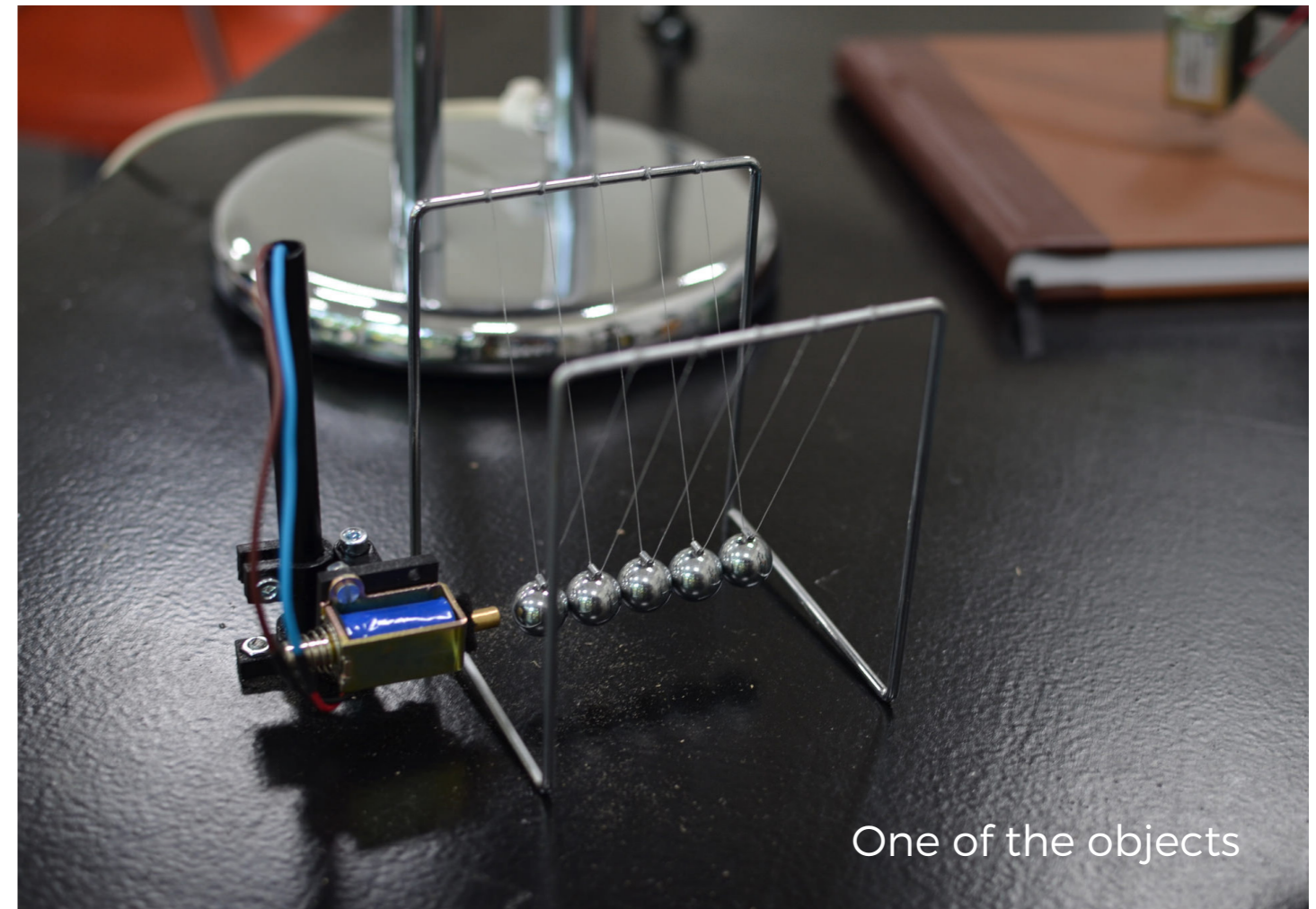
The hardware stayed mostly the same for the second prototype as the first, since it is completely programmable and did not show any problems during tests.

Future

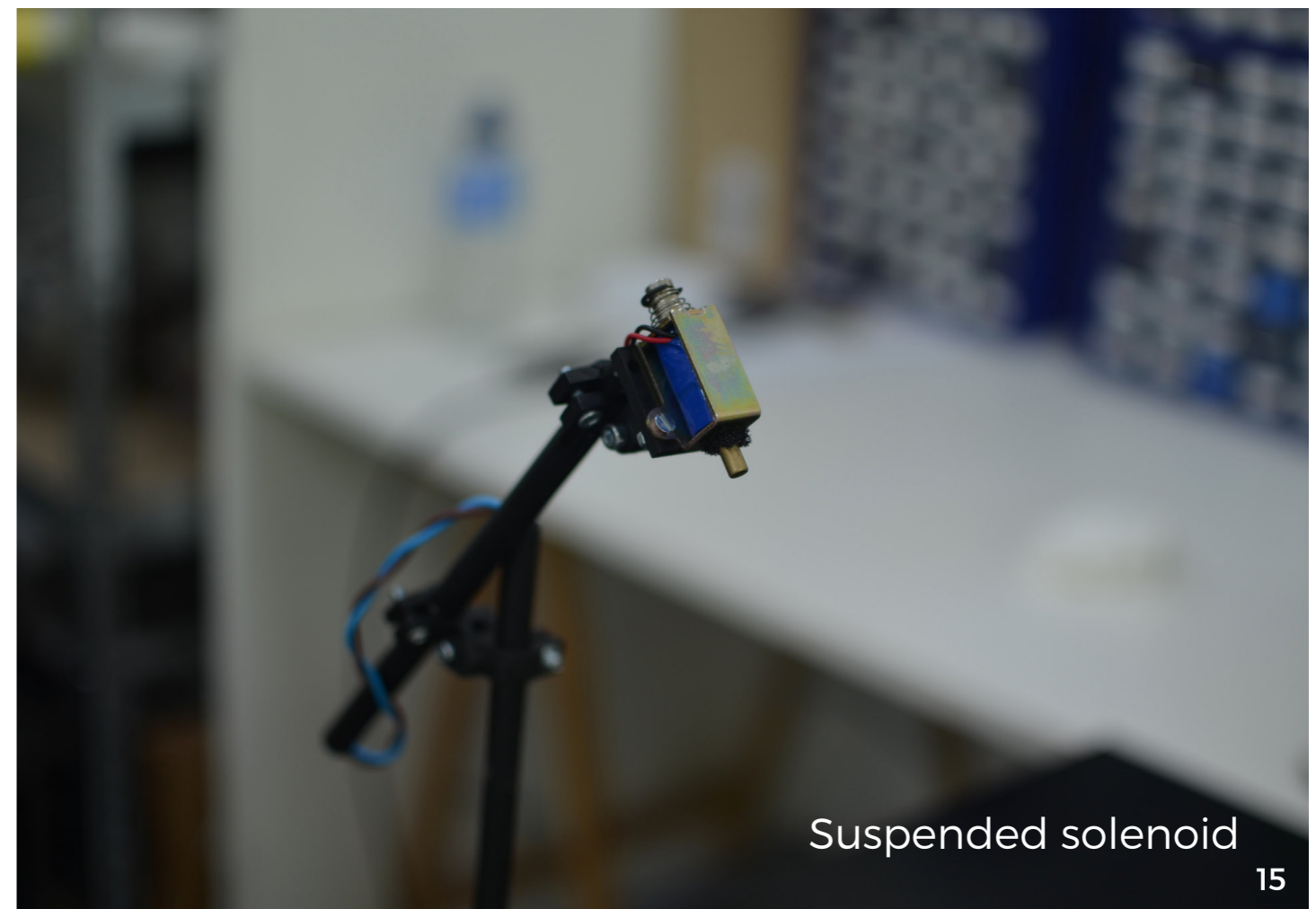
The current prototype of the Human Decoder is most focussed on a museum or exposition setting. Continuing on that trend the next step is building the set on the new desk and building a suited glass dome over it. After that the upgrading has to begin, right now there is a working set but both mechanically and digitally there need to be adjustments to convey the concept even better and make the entire installation even more interesting and capturing.

Mechanically it's of course far better to use powder-coated or even anodized black metal tubes and having the clamps milled instead of 3d printed will improve the stability even more. Especially the clamps directly holding the solenoids can shift over time, causing the very delicate positioning of especially the bass notes to go off.

Digitally there is even more to do. A layer of effects and digital processing could provide even more diversity and recognisability to the individual song. Another next step would be: providing the user with a code or link to fetch their song online after they heard it might increase the virality and captivity of the project even more. Finally, other input methods have to be implemented; fingerprints, iris-scans, facebook data. With the current system if any of this data can be boiled down to a number, a song can be generated. The next step is saving all the data, putting a monetary value on it and providing the songs online to users.



One of the objects



Suspended solenoid

Facturis

Facturis (<http://facturis.nl>) is a daughter company of Rabobank (<http://rabobank.nl>) that aims to simplify the billing process for both small and large companies. OWOW is in a long standing relationship with the Rabobank and so they asked them to work on the Facturis website. Because of my experience building websites I worked together with Pieter-Jan to build and design a dynamic and fresh website to help their cause.

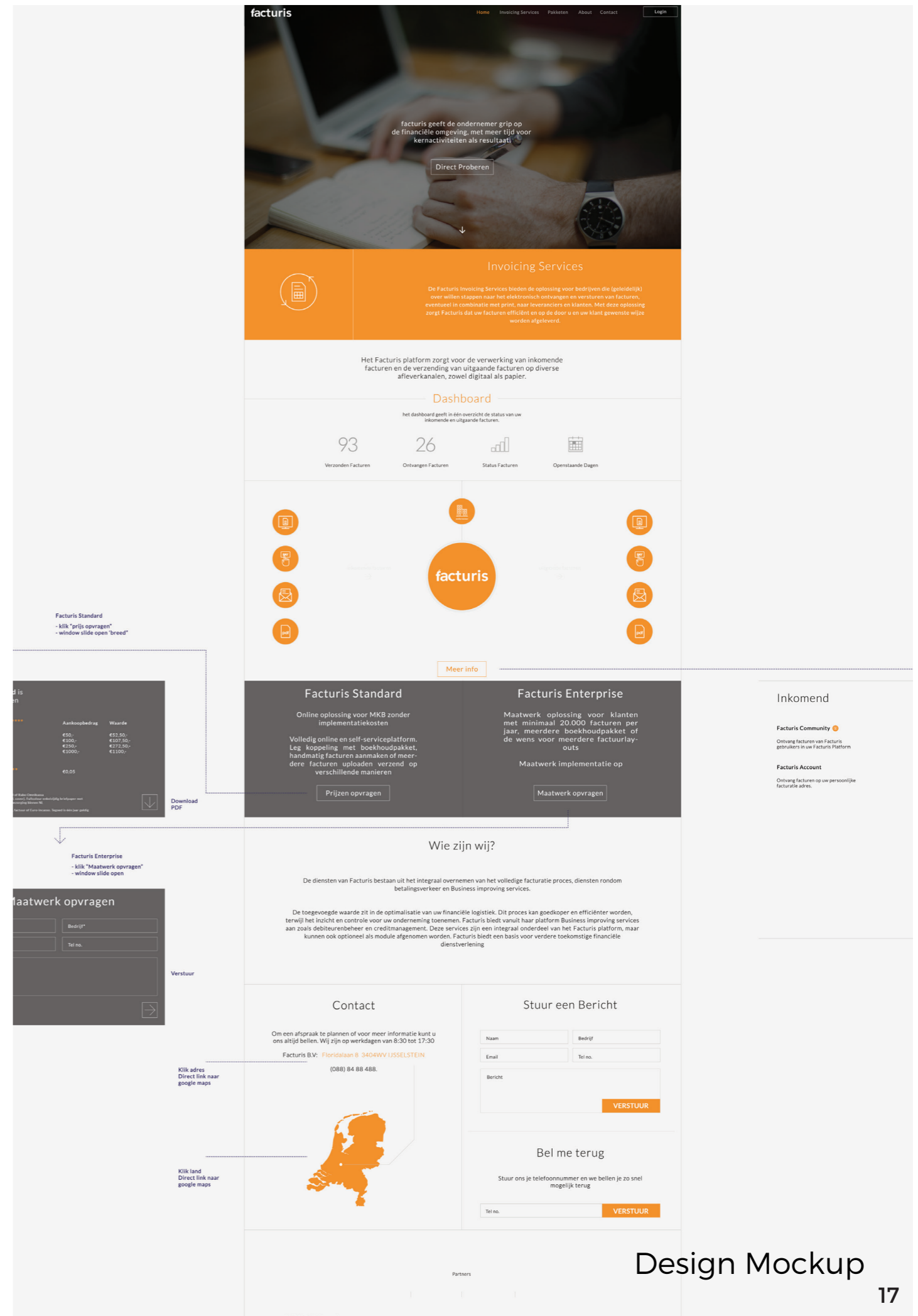
Design

While I learned what Facturis was all about, Pieter-Jan made a preliminary design. The website would become a one-paged website with simple colors; white, orange, and purple, the Facturis colors. The design was easy enough to show to Facturis for feedback, but did not include the full experience we might need to get full feedback and impress Facturis.

This is where I came in. I quickly build a useable version of the preliminary design. The preliminary design was purely visual, I recreated it in detail using HTML, CSS and JQuery. Allowing me to implement animations tied to the user's scrolling, to make finding out more on

the site more enjoyable and tempting. Seeing the site fully dynamic and functional allowed us to consider how the graphics and animations should look and behave.

Especially an animation near the top on the website was important. It featured a Facturis logo in the centre and clients on either side of it, the animation illustrates how Facturis collects all bills and sends them as one type to their users and then distributes them again, using any medium. After a lot of iterations, where we send the website with the animation implemented to Facturis and processed the feedback, we got to the website everyone was content with. I was personally in contact with Facturis to make changes to the design, content and solve any bugs.



```

contact_form.php x index.php x payment.js x
1 <!DOCTYPE HTML >
2 <html xmlns="http://www.w3.org/1999/xhtml">
3 <head>
4 <meta http-equiv="Content-Type" content="text/html; charset=utf-8">
5 <title>Facturis | Excellence in financial logistic
6
7 <link href='http://fonts.googleapis.com/css?family=Open+Sans:400,300,700,800' rel='stylesheet' type='text/css'>
8 <link href='http://fonts.googleapis.com/css?family=Open+Sans:400,300,700,800' rel='stylesheet' type='text/css'>
9
10 <!--[if lt IE 9]>
11 <script src="js/jquery-1.11.2.min.js"></script>
12 <link href="css/html5shiv.min.css" rel="stylesheet">
13 <!--[endif]>
14 <!--[if gt IE 8]><!--
15 <script src="js/jquery-2.1.3.min.js"></script>
16 <script src="js/payment.js"></script>
17 <!--[endif]>
18 <script src="js/TweenMax.min.js"></script>
19 <script src="js/jquery.scrollmagic.min.js"></script>
20
21
22 <script src="js/navigation.js"></script>
23 <script src="js/payment.js"></script>
24 <script src="js/main.js"></script>
25 <script src="js/smoothscroll.js"></script>
26 </head>
27
28 <body>
29 <?php
30
31
32
33 function get($name,$number){
34 $lines = file_get_contents($name); //file into array
35 $exploded = explode('///', $lines);
36 echo nl2br($exploded[$number]);
37 }
38
39 >>
40 <div class="navcontainer">
41 <div class="navigation">
42 <a href="#page1" class="img"></a>
43 <a href="https://documenten.facturis.net/login" class="img">
44 Login
45 </a>
46
47 <ul>
48 <a class="5" href="#page6"><li>
49 Contact
50 </li></a>
51
52 <a class="4" href="#page5"><li>
53 About
54 </li></a>
55
56 <a class="3" href="#info"><li>
57 Oplossingen
58 </li></a>
59
60 <a class="2" href="#page2"><li>
61 Invoicing Services
62 </li></a>
63
64 <a class="1" href="#page1"><li>
65 Home
66 </li></a>
67 </ul>
68 </div>
69 </div>
70
71 <div id="page1">
72 <div class="shade"></div>
73 <div class="probeer">
74 <p>
75 <?php get('tekst/1.directproberen.txt')
76 </p>
77
78 <p class="link">
79 <a id="link" href="https://documenten.facturis.net/login" class="link">
80 <?php get('tekst/1.directproberen.txt')
81 </a>
82 </p>
83 </div>
84
85 <a href="#page2">
86 </div>
87
88 <div id="page2">
89 <div class="left">
90 <div class="image">
91 
92 </div>
93 </div>
94 <div class="right">
95
96 <h2><?php get('tekst/2.invoicingservices.txt')
97 <h3>
98 <?php get('tekst/2.invoicingservices.txt')
99 </h3>
100 </div>
101 </div>
102 <div class="slogan">
103 <h3><?php get('tekst/3.slogan.txt', '2'); >></h3>
104 </div>
105 <div class="dashboard">

```

```

1 $(document).ready(function($) {
2   var listpos1, listpos2, listpos3, listpos4, listpos5, listpos6, listpos7, listpos8, listpos9;
3
4   function payment() {
5     listpos1 = ($("#li#1").position().top) + 30;
6     listpos2 = ($("#li#2").position().top) + 30;
7     listpos3 = ($("#li#3").position().top) + 30;
8     listpos4 = ($("#li#4").position().top) + 30;
9
10    listpos5 = ($("#li#5").position().top) + 30;
11    listpos6 = ($("#li#6").position().top) + 30;
12    listpos7 = ($("#li#7").position().top) + 30;
13    listpos8 = ($("#li#8").position().top) + 30;
14    listpos9 = ($("#li#9").position().top) + 30;
15
16    listposleft = ($("#page3").width()/10) + 30;
17    listposright = ($("#page3").width()*0.9) - 60;
18    userpos = ($("#img.user").position().top) + 60;
19
20    xcenter = ($("#page3").width()/2) - 20;
21    ycenter = ($("#page3").height()/2);
22    // init controller
23    controller = new ScrollMagic();
24
25    var counter1 = { var: 11 };
26    var verstuurd = document.getElementById("verstuurd");
27
28    count1 = new TimelineLite().to(counter1, 5, {
29      var: 36,
30      onUpdate: function () {
31        verstuurd.innerHTML = Math.ceil(counter1.var);
32      },
33      ease:Linear.easeInOut
34    });
35
36    var counter2 = { var: 7 };
37    var ontvangen = document.getElementById("ontvangen");
38
39    count2 = new TimelineLite().to(counter2, 4, {
40      var: 21,
41      onUpdate: function () {
42        ontvangen.innerHTML = Math.ceil(counter2.var);
43      },
44      ease:Linear.easeInOut
45    });
46
47    // build tween
48    tween1 = new TimelineLite()
49      .fromTo("animate.1", 2,
50        //start
51        {left: xcenter, top: userpos},
52        //middle
53        {left:xcenter,top: ycenter,
54        delay: 1})
55      .to("animate.1", 2,
56        //end
57        {left: listposright, top: listpos7});
58
59    tween2 = new TimelineLite()
60      .fromTo("animate.2", 2,
61        //start
62        {left: listposleft, top: listpos2},
63        //middle
64        {left: xcenter, top: ycenter,
65        delay: 2})
66      .to("animate.2", 2,
67        //end
68        {left: xcenter, top: userpos});
69
70    tween3 = new TimelineLite()
71      .fromTo("animate.3", 2,
72        //start
73        {left: xcenter, top: userpos},
74        //middle
75        {left: xcenter, top: ycenter,
76        delay: 0})
77      .to("animate.3", 2,
78        //end
79        {left: listposright, top: listpos6});
80
81    tween4 = new TimelineLite()
82      .fromTo("animate.4", 2,
83        //start
84        {left: xcenter, top: userpos},
85        //middle
86        {left: xcenter, top: ycenter,
87        delay: 3})
88      .to("animate.4", 2,
89        //end
90        {left: xcenter, top: ycenter,
91        delay: 3});
92
93    controller.addTweens(tween1, tween2, tween3, tween4);
94  }
95
96  payment();
97
98  controller.on("scroll", payment);
99
100  controller.scrollTo(0, 100);
101
102  controller.start();
103
104  });
105

```

Sample of the code

Technology

I was pretty familiar with HTML5 and CSS3 when I started my internship, because I can build sites pretty quickly and Pieter-Jan worked on the design simultaneously we could get a lot of feedback and back and forth with the company the website was for.

We really wanted to have animations tied to the scrolling of the user on the website, to seduce exploring the website. We also wanted users to dynamically interact with the website to retrieve prizes or ask for further information. The dynamic interactions are done purely using JQuery and CSS. For the scrolling effects I had to do some more research. Eventually I chose the Green-Sock Animation Platform¹ to handle the animations on the website and Scroll-Magic² to tie the animations to scrolling.

Facturis required three forms on their website, one for contact, one to inquire to prizes and one to ask to be called back. I had to write these in a language I am less familiar with, namely PHP. The online forms take the information that is entered and email it directly to Facturis, after which they can engage in contact.

1 www.greensock.com/
 2 www.janpaepke.github.io/ScrollMagic/

In the end i stayed in contact with Marcella van Harn, our connection in Facturis, to fix any bugs. A bunch of small changes eventually pushed me to create a system for Facturis to change the text and prices on their website. Instead of having the text in the actual HTML file, I put all text in separate .txt files, which were easy for them to edit. PHP fetches the .txt files before serving the website to the client, causing no difference to a viewer of the website, but a far easier method of editing for the maintainer of the website. After this, Facturis was very pleased with the website.

Heineken

The project I helped out with for Heineken was a pitch for a larger plan to make smart bottles. The idea is to eventually have smart bottles, which tell you where they are if you lose them and know how much you drank. The bottles could be used to block specific numbers in your phone, automatically arrange a taxi for you, lock your car until the next morning or raffle prizes. Because right now it's expensive and technically difficult to implement technology like this in a bottle in an unobtrusive way, a long term plan was pitched.

Pieter-Jan did the designs for the bottles, so my focus was on actually getting the designs on the bottles and exploring some other ways to illustrate the smart bottle concept.

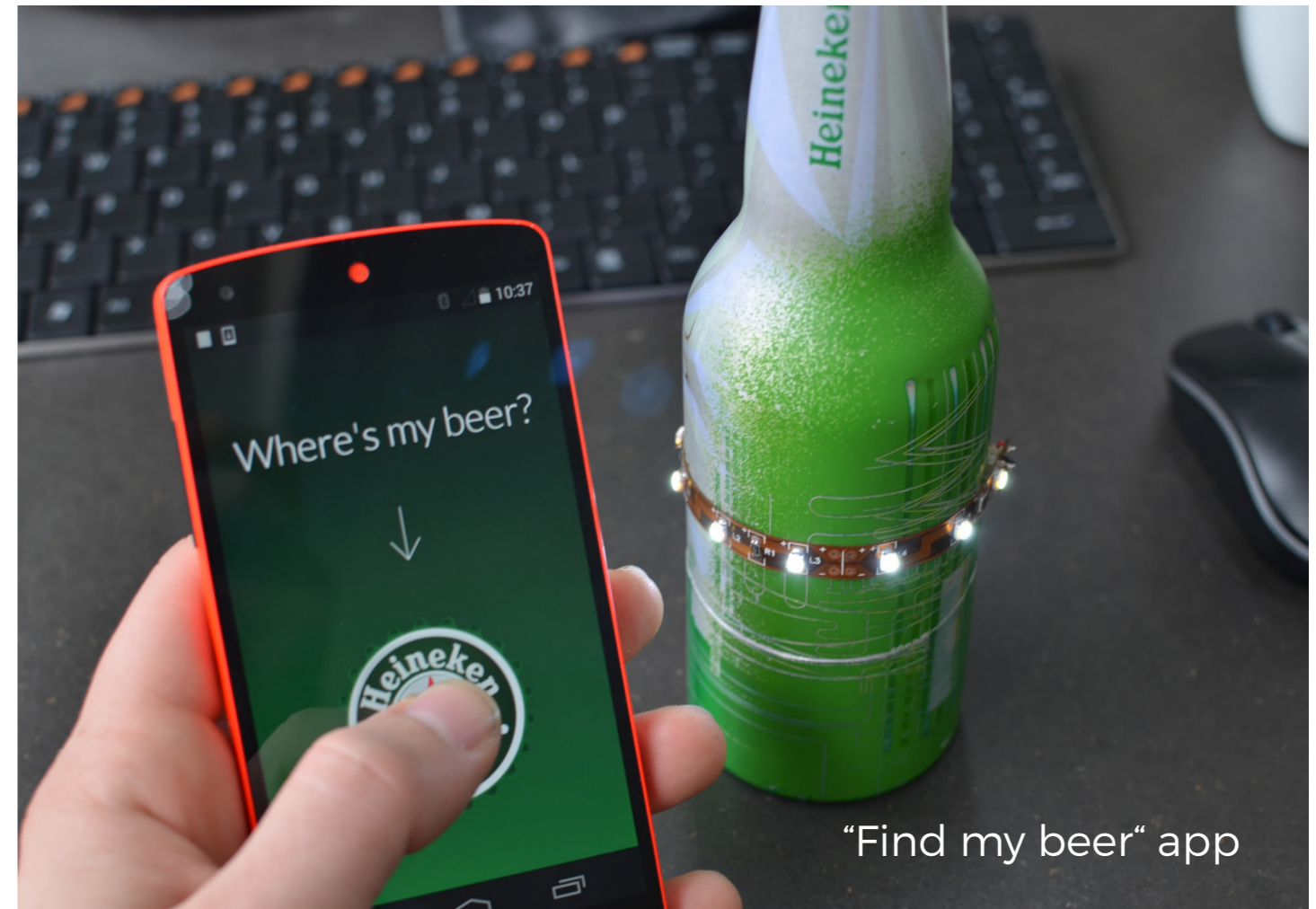
Technology

We got hold of some special edition metal Heineken bottles, with the idea to use the metal to illustrate circuit board traces. The most obvious way to do this is coating the bottles in a layer of paint, and exposing the metal underneath. The fastest and easiest way to do this is

using a laser cutter. This however poses the problem that laser cutters are good at engraving flat surfaces, not cylindrical objects. Luckily the laser cutter had an add-on that allows for rotating of the object being cut.

I set out to perfectly align the machine and created an Illustrator template that together make it easy to make a design and engrave an entire bottle. I was even able to engrave the neck of the bottle independently from the body. The bottles helped pitch the idea to Heineken and made them excited to go on a long venture to create a smart bottle.

After the designs were worked out I implemented one of the functions a smart-bottle should have in one of the bottles we had. I put an Arduino pro mini with Bluetooth receiver inside of a bottle and connected it to a LED strip on the exterior. I designed and coded a simple app to send a signal to the Arduino. When the Arduino received the right input from the app, the lights on the outside of the bottle it was linked to would glow, showing where the bottle is. It's just one of the many things a smart-bottle should be able to do in a few years.



"Find my beer" app





Reflection

My internship at OWOW taught me a bunch of things, but my biggest takeaway is that everyone, even huge corporations, can get excited by cool stuff. The guys at OWOW aren't afraid to step to a company and just show them an interesting idea. As long as you're behind your own idea, as long as you're convinced it should exist, as long as you're prepared to work hard for an idea there will be a takeaway. Maybe the company doesn't want it, how about another one? Or just start your own company and do it anyway!

OWOW made me to not only broaden my view, by allowing me to work with real, big clients and very diverse projects. They also allowed me to deepen it,

doing what I love. Because the requirements were absolutely different from week to week or even day to day, I got the opportunity to absolute lose myself in a subject for a little while, figure it out on my own or with the people around me. It's impossible for a designer to just be trained and work from that for the rest of their career, you have to prepared and able to educate yourself.

Another point of interest is knowing your limits and goals. Teaching yourself is crucial, but sometimes you just can't, or shouldn't, do it on your own. Giving project out of hands is always hard, the temptation to get side-tracked and just keep the project to your self is immense. At OWOW however I learned how im-

portant it is to know your own skills and to involve others when creating something you might now have the required knowledge for. You need contacts and experts to guide or help out if you really want to get ahead.

Due to the big and diverse clients OWOW had, I got to work on some projects I really wouldn't be able to at the study. I got to see up close how it is to maintain a relationship with a client, how to communicate to them and how to make sense of the combined experience of two or more companies to reach a mutual end goal. It was great to actually be able to finish a job for Facturis and not exclusively get stuck on "helping out" with projects, it allowed me to more seriously be part of a company and get a better insight in what that means.

On the completely opposite side of the scale I got to see how it is for a company to dive into a completely conceptual project. Not even knowing where it will end, but just sticking with an idea you think is worthwhile. An interesting pro-

ject is a great way to collaborate with other companies and organisations and when it's done it can be a great way to attract attention to your ideas and show a certain drive and vision to the outside world.

I think that overall, the experience of being able to work in a company is absolutely invaluable. Due to the different projects I think I got a really good cross-section of how it is to work in a design studio. I also think I really got a good chance to explore my personal design process in a real world setting, with real stakes and real business relationships involved. I had a lot of fun in the office and every day was a new experience and I really think I had a huge takeaway from this. Both directly, as Pieter-Jan proposed to continue work on the Human Decoder, but also indirectly; by now being able to apply the aforementioned lessons to my own design progress. Hopefully I can use everything I learned in my final bachelor project!

2015

BasB.nl

