Innovation & Gestaltung

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Design Documentation
Project “Glass Blow Molding”
SS 2018

Study Program Industrial Design
Concept & Design
Prof. Anke Bernotat & Judith Schanz
In Cooperation with Steffi Lenz
Lars Lange & Nils Tiemann

“Hand Blown Series”

Design of a whisky bottle line in cooperation with Owen-Illinois Glass Bottling Company and Folkwang UDK.

Folkwang Universität

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Research
definition, origin & tradition, signifiers,
craft & megatrends, media and material, color palettes.

Concept Development
mind mapping, concept routes, story development,
sketch, surveys, concept definition, elevator pitch.

Process & Realization
scan method and technique, model preparation,
CAD processing. booklets, brochures and presentation.

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Documentation of the course “Glass blow molding” in the summer semester 2017/2018.

Josh Gelfand master craftsman working with glass (pic 1)

The “Glass Blow Molding” course focused on the development of creating a standard bottle range for O-I, suitable for all different types of spirits. The course concentrated on the topic of craft distilling and how a bottle could express the craftsmanship of a product. Throughout the semester we explored shape, color, decoration, size, and labeling

With the defintion of craft came the understanding of the stories behind products and how they are projected to the consumer from the shelf. I wanted to create a bottle with a story that resonated with the pillars of craft, tradition, individuality and experimentation.

During the course I developed a concept of traditionally blowing spirit bottles by hand and then usuing modern technology to 3-D scan the bottles and adapt them to standards, thus allowing mass production while hopefully maintaing artisinal charecteristics.

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The project was divided into three project phases:

1st project phase: Research / Analysis

Familiarization with the glass bottling market and industry. (infomation provided by O-I)
Learning about glass manufacturing. (“Glass University” frontal presentation by O-I)
Visiting the “Holzminden” Glass Manufacturing Company.
Researching “Craft”, origin and tradition, defining the term and its meaning today.
Analyzing why craft is still relivent today. How it is reflected in global consumer megatrends and how it is signified, with focus on media, material, palettes and shapes.
Fifty quick sketches on possible designs within the research question.
Studying drinking routines and purchasing habits, especially through surveys and interviews.
Defining and illustrating a mind map built of the topics and trends.

2nd project phase: Concept Development

Using the findings from the previous analysis phase to develop possible concept routes.
Presentation forms for the different Concepts (mood boards, sketches, and CAD models.)
Formulate personal concept (Elevator pitch).
The results of the 2nd project phase were presented on 13.6.18 in a presentation
shown at the the O-I offices in Dusseldorf and discussed with Steffi Lenz Lars Lange and Nils Tiemann

3rd project phase: Process and Realization

Preparation and detailing of the best approach from the 2nd project phase under consideration of the criteria from the specification.
Visualization of the elaborated concept or preparation of a design model.
In my case; brochures and pamphlets that explained the concept both to O-I’s future
costumers and to the end user.
Create a comprehensive presentation in which the developed design concept and its implementation is clearly derived and justified.

The design process and the result from the project phases 1 to 3 were presented at the end of the project on the 26.9.18 at the O-I offices in Dusseldorf. The representatives were present at this presentation. These Representatives ultimately formed together with Anke Bernotat and Judith Schanz from the Folkwang University the jury, which nominated the four best projects of the course.

1. Research

“Craft”, origins and traditions, defining the term.

On first aproach I needed to understand what craft was and where it came from. I did extensive research on the origin of the word and how the concept changed and adapted over history.
I followed up by looking into the definition of craft in the sphere of spirits and distillation.
Craft is a pastime or a profession that requires particular skills and knowledge of skilled work.
The term craft brings to mind the perception of small batch handiwork being made in a family setting, by a small or medium enterprise, with high quality standards. Many Masters of craft consider that in order to be true to the art one must not only care about the end result, but also the process.
This is a concept that really resonated with me and I realized how important it was that the bottle I design would reflect the same care and passion put into the process of the spirit it contained.

Mind Map developed during the course reflects craft in Global Mega-trends.

1. Research

Craft Relevence and Global Mega-trends

Our global market is being led by forces of development that impacts business, economy, society, cultures and personal lives. These forces are called mega-trends. Craft, as a concept, falls in line with these megatrends and therefore is rapidly gaining market shares over the last decades. There is a shift in consumer preferences away from mass-produced products in search of authentic experiences. In a society where everything is developing so fast many look to simple object for reassurance and stability. Millennials and Gen-Xers are more concerned for their well being and the wellbeing of the world around them.They are driving the trend for traditional and premium products that provide nostalgic value and echo trust and transparency. Craft or "artisanal" products are perceived to be higher quality, healthier and authentic. Optimistic craft distillers are looking to imitate the success of craft breweries. Although market share remains dominated by giant distilling corporations a local spirit explosion has taken the industry by storm. Craft distillers are quickly attracting a larger market as they release unique and unorthodox flavors that mega-corporations lack the logistical flexibility to produce. Modern whisky drinkers are abandoning old allegiances in favor of increased variety and new concepts.

Craft Signifiers, Palettes, Shapes and Materials

I began my research by exploring craft products in general.
I tried to recognize signifiers in the design that spoke to me of craft, or that others would recognize as crafty.
Craft products are usually associated with natural materials, wood, straw, glass, stone etcetera. Due to the use of natural materials a natural toned color palette is present by default. In the design of labels or product add-ons this palette is kept to encourage the "natural" association. The natural colors work harmoniously together. Most labels are kept as simple as possible in an effort to convey simplicity and transparency or "having nothing to hide"
Craft products take pride in the manufacturing process and will often use slow, hand processes. In any hand process, the margin of error rises but these imperfections are often considered product features and contribute to the uniqueness of the product. Although it is product dependent, crafty product tend to have more feminine curves and are more amorphic, echoing shapes occurring naturally. Another signifier is using locally sourced materials so that the product becomes infused with the DNA of the region.
From this exploration I tried to categorize these signifiers and map out my definition of craft in search of a concept route to approach my bottle design.

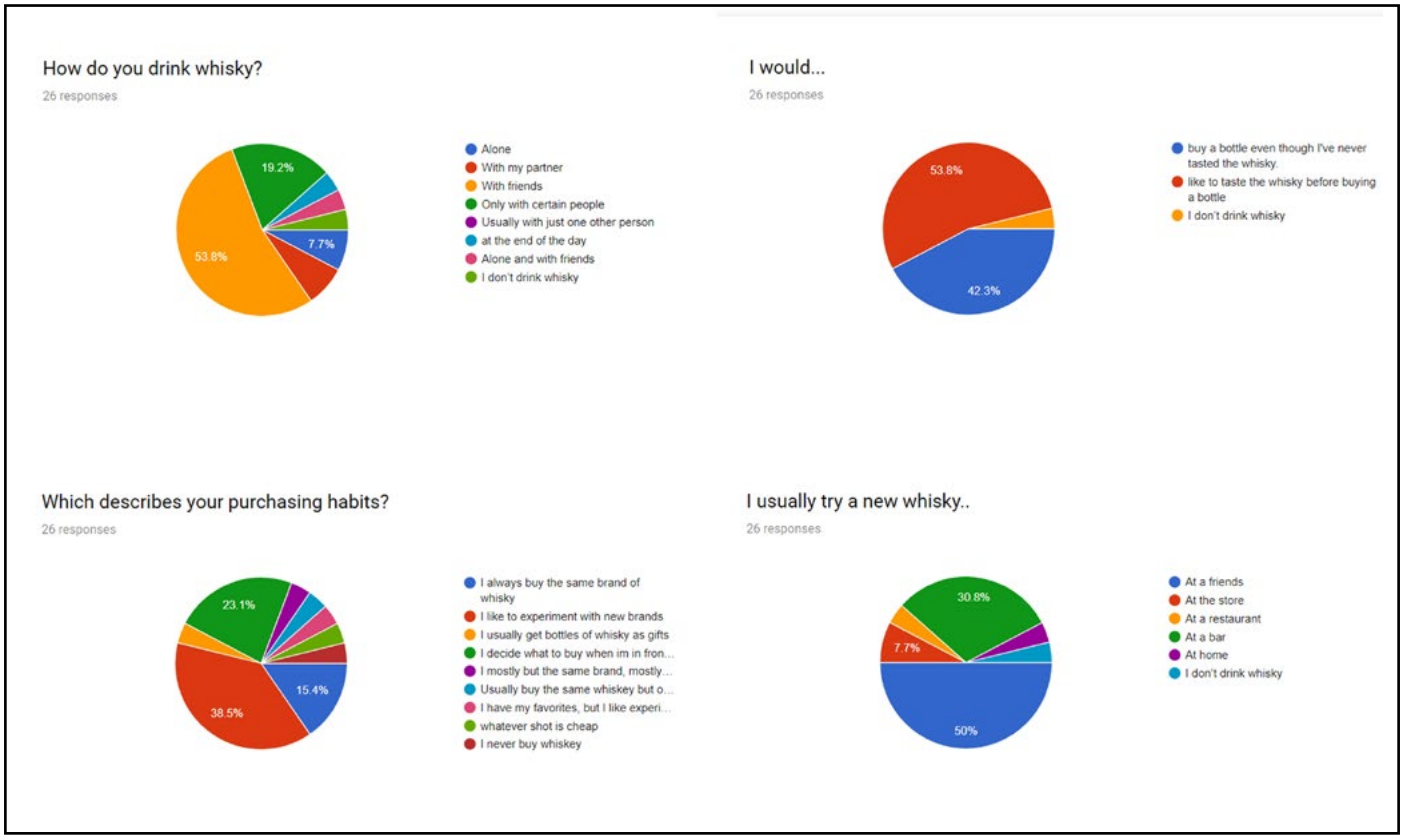
Example of whisky bottle with craft signifiers: Natural materials. natural tones simplifiedhand written label, simple curves. (pic 2)

1. Research

Surveys, Drinking habit and Routine

I created a survey of 20 questions about whisky drinker's purchasing and drinking habits. I shared the survey via social media.
I summarized the finding to 4 key factors:
1. Whisky is a social drink. It is usually drunk among friends.
2.A social drinker is most likely to be introduced to a new whisky through a friend at a drinking session, where the whisky will be discussed, bottle label and of course taste.
3.Whisky drinkers specifically (reletive to other spirit drinkers) are shown to be more prone to experimenting with new brands. This is actually quite a big part of whisky culture. Most whisky drinkers will have the bottles they know and prefer (usually known classics that establish them as whisky conniseurs in the eyes of others) and the new bottles they buy to experience, share and try with friends.
4. Most people will want to try a whisky before buying it.
"Full sized" bottles of whisky can be quite expensive and so taster sizes should be available.
I concluded that in the whisky market the best advertisement, the best promoter, was the costumer themselves. So it was the whisky companys job to create a multi-layered experience that the customer would want to promote. From purchasing experience, through bottle and label to conversation that came with it.
In short they needed a story to tell and craft had one.

extracts from a 20 question survey shared via socila media to learn about whisky purchasing and drinking habits



2. Concept Development

Concept Routes

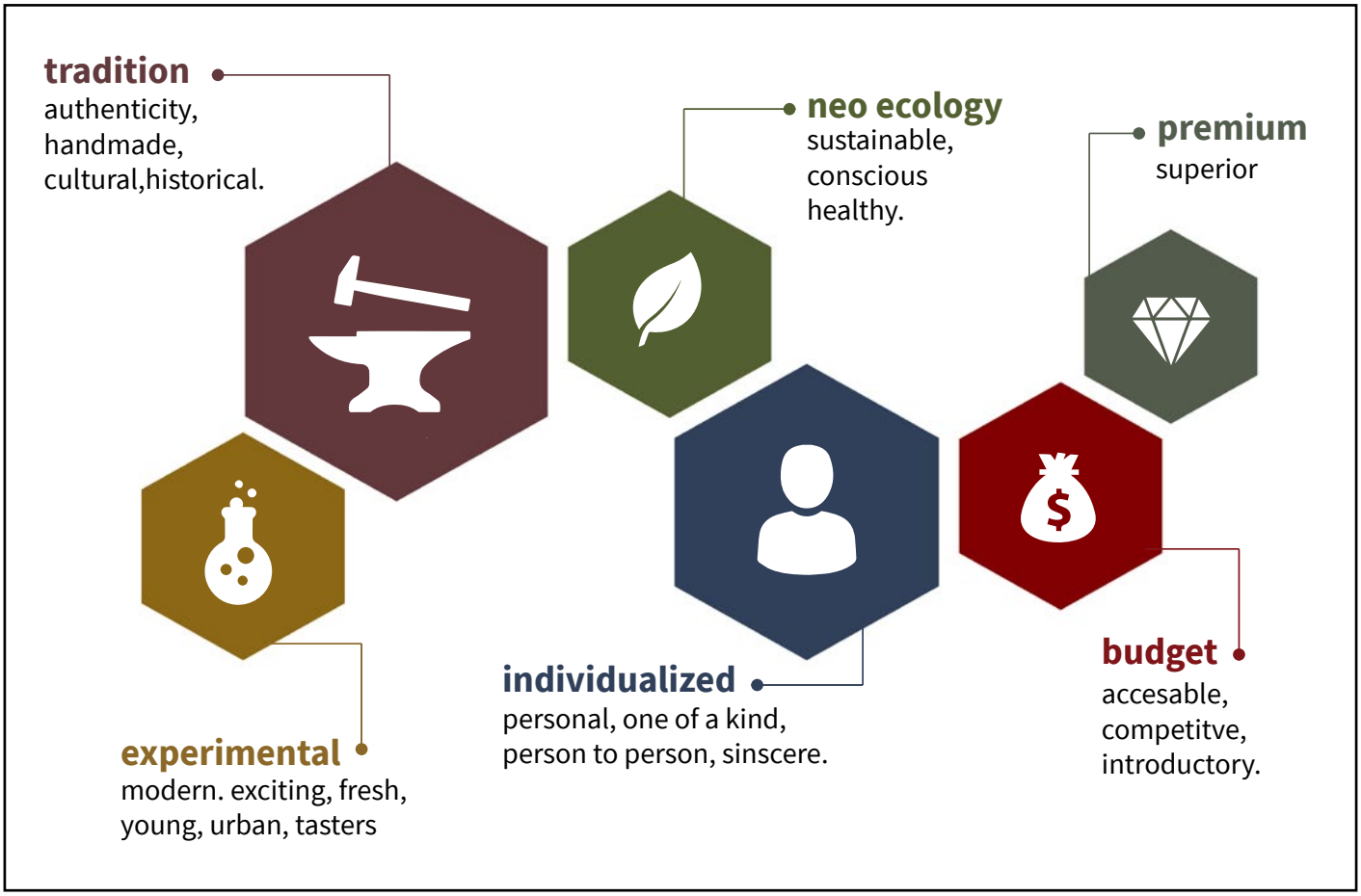
Based on the research and analysis in the first stage of the project, I summerized to 6 concept routes in which to aproach my design. These routes reflected both the current mega-trends and also the history and origins of craft work.

I decided to put an emphasis on tradition. Research shows that gen-X-ers and millenials are in search of new and exciting products but it also shows that they have a respect and a longing for tradition and authenticity.

I also concentrated on Individualization, I wanted to create the perception that every bottle was unique and that it had been crafted by hand. It had a personal touch and a personal story.

It was important to me that the bottle could also reflect the modern age and the developing technology and that did not contrast tradition. Based on these different aproaches I concluded that the bottles need to be hand blown. Then each hand blown bottle could be 3-D scanned and adapted using Computer automated design and made to match production standards while maintaing artisinal charicteristics.

Defining concept routes based on research of megatrends and the origins of craft.



2. Concept Development

Sketches and Cad models

I needed to create a bottle with a story that spoke of tradition, of individuality and experimentation - a personal story
In my first stage of sketching I looked mostly at what was possible with traditional hand blown technology, what bottle looked like 200 / 300 years ago. Why were they designed the way they were and what features would still be useful or interesting today. I also needed to understand the limitations of hand blowing and what were the reason behind the structure of each type of bottles. Did the bottle have that shape simply because it was easiest to produce or did it have other more functional reasons. I was also very interested in how time and place affected bottle design. For example bottles to be carried on a ship would need to be more stable (wide bottom) or more easy to pack in a crate (square bottles) and so on.

Sketches of small bottles (50ml)

Sketches of medium jars.(400ml)

In accordance with the research and analysis from the earlier stage I understood the craft needed to be present in every layer of the process. I decided to create families of bottles, small medium and large. I worked on marketing plans for each size that would encourage the craft story behind each product. The different sizes would allow the consumer the option to taste without buying a full size bottle but also how and where they could buy each bottle was an integral part of the overall craft story.
The small bottles could be sold in cafes / restaurants and bars.
It would give you the opportunity to taste a whisky without buying the whole bottle but also it would act as a business card that you could carry home with you.
The second size bottle would be a medium 400 ml jar. You could fill the jars on the spot straight from the barrel In alcohol stores or at alcohol fairs using the very cool syphoning tool. It would make the user feel part of the process. It makes the product feel localized. It came with a hand written label that shows the batch number, barrel, how many bottles have filled and so on.

Sketches of Large bottles (750 ml) inspired by bottle design of the 19 hundreds

Sketches from the process

2. Concept Development

Elevator pitch

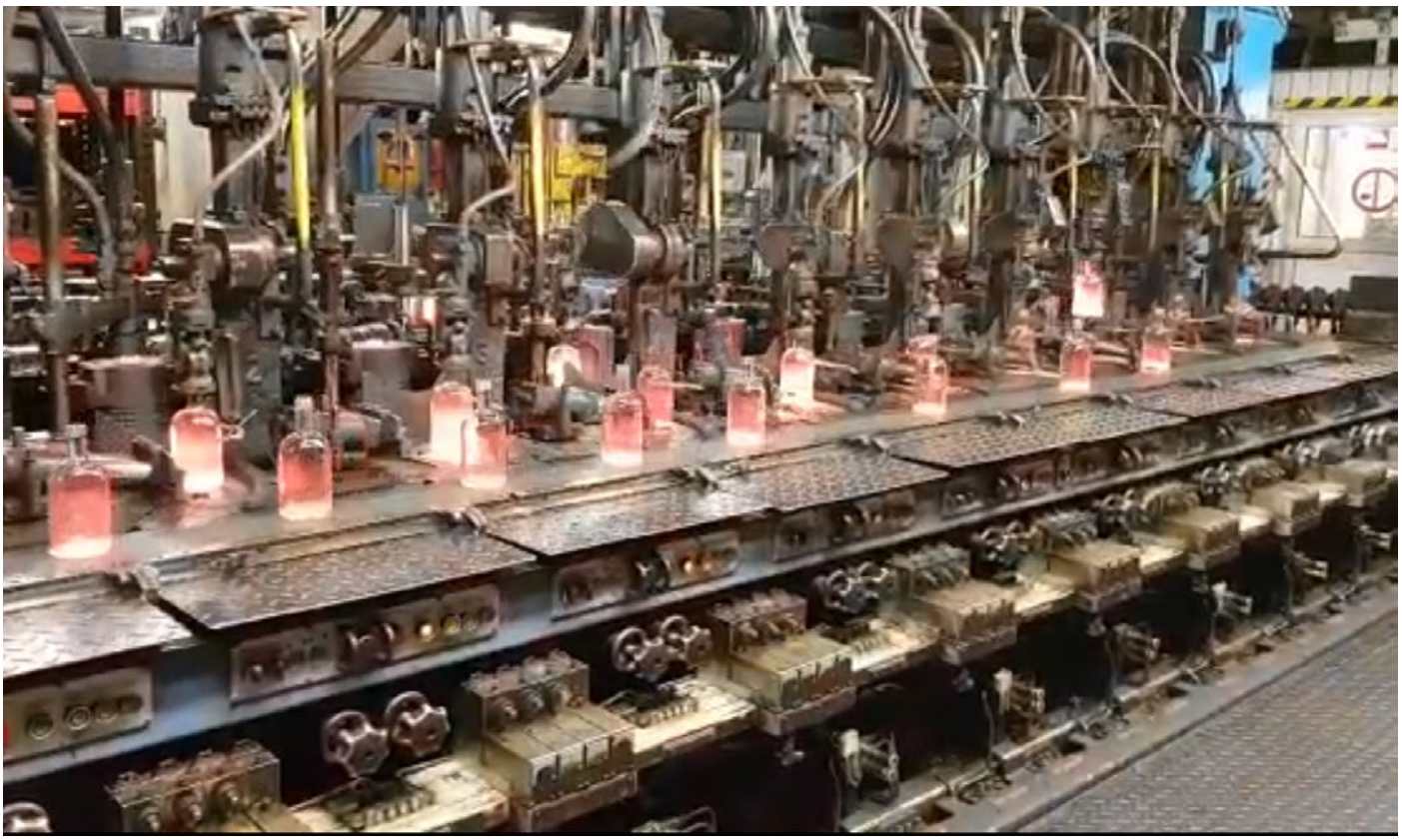
I needed to create a bottle with a story . A story that spoke of tradition, of individuality, and experimentation. A personal story from heart and hand. I would have traditionally produced hand blown spirit bottles in collaboration with glass blowing masters.
The 3-D scan the bottles and adapt them to the market standard while hopefully maintaining their artisanal characteristics

glass blowing tools (pic 3)

Expansion:

I wanted to create a many layered story behind my bottle that brought personal touch into it at every layer.
My idea was to find traditional master glass blowers and have them each design a family of 3 bottles based upon their own personal stories and of course certain design criteria given to them (general dimensions etc.)
They would produce 5-10 of each bottle size, those with the most distinct characteristics would be scanned and uploaded then processed to match industry standards (size, neck diameter, etc) Those design would then be made into molds for mass production. By using a couple different molds of the same bottle design the bottles would appear on first glance on the shelf to each be individual.

Visit to Holzminden glass manufacturing company



3.Process and Realization

Technique: 3-D scanning process

(step 2) Model bottle placed in arm contraption prepared for layer of chalk spray

Step 1. The bottle is blown using traditional mouth blowing techniques. The aim is to have the model be as close as possible to the dimensions of the final product requirements. Any imperfections on the bottle are features that will be transffered to the final product. These give the bottle their unique quality.

Step 2. The bottle is sprayed in a layer of chalk spray. the chalk spray is thin and copies the surface of the bottle, imperfections and all. This layer is created because otherwise the glass would refract the light from the 3D scanner and the scanner would not be able to comprehend where the surfaces of the bottle. From this moment the bottle can no longer be handled by hand. Touching the bottle removes the layer of chalk. I created an arm contraption that holds the bottle in place and allows scanning of maximum outer surface including the bottom.

Step 3. Using a contrasting color (black in this case) I lightly sprayed a second layer on top of the chalk. This layer is created to texturize the model. the large black spots create anchor points that allows the scanner to understand its position in space relative to the bottle.
I found the best way to apply this layer is to hold a spray bottle 30-50 cm away from the bottle and press in quick short bursts.

(step 3) Model bottle sprayed with layer of chalk and texturized with black spray paint.

Step 4. In a relatively dark room I placed the bottle and arm on a rotating table that allowed me to easily scan the bottle from all different views. I used a GO!SCAN3D scanner that projects a coded pattern of light from an white light (LED) source. This coded pattern will match the shape of the object to be scanned. The software, which can decipher the specific code, can create a 3D geometry of the object from each camera frame.

Step 5.The data from the scanner gets sent to the computer and the mesh is created in a software called Creaform. At this stage I had to repeatedly check the mesh on the program to see what angles I was still missing and to go back and rescan the model. I realized that the contrasting layer I had created was not strong enough around the bottom and neck so had to stop at this point and spray another layer with higher and larger contrast anchors.

3. Process and Realization

(Step 4) My scan setup. Go!SCAN3D with tripod and Kinect to document the process.

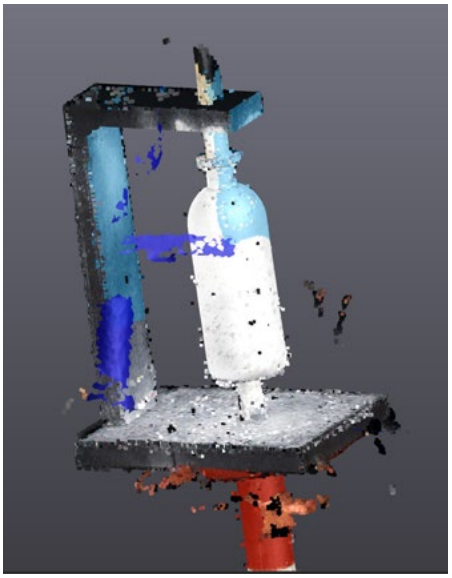
Step 5. The data is proccesed and a mesh is rendered. Isolated parts of the mesh are deleted and the surface is refined. Any holes in the surface are patched. These options are offered in the program.

Step 6. The mesh is saved as a .STL file and imported into Mesh-Mixer by Autocad. The excess arm mesh is cut away.

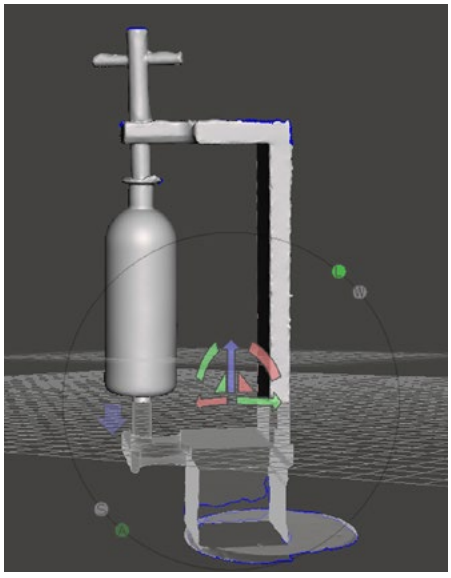
Step 7. The mesh is refined and turned into a solid object. Any impurities in the scan are fixed.

Step 8.The bottle is shelled and the neck whole is cut to match stanard cork dimensions. The bottle is scaled to size and the inner volume capacity is checked to match standards.
A CNC mold can now be made.

(step 4)



(step 6)



(step 8)

3. Process and Realization

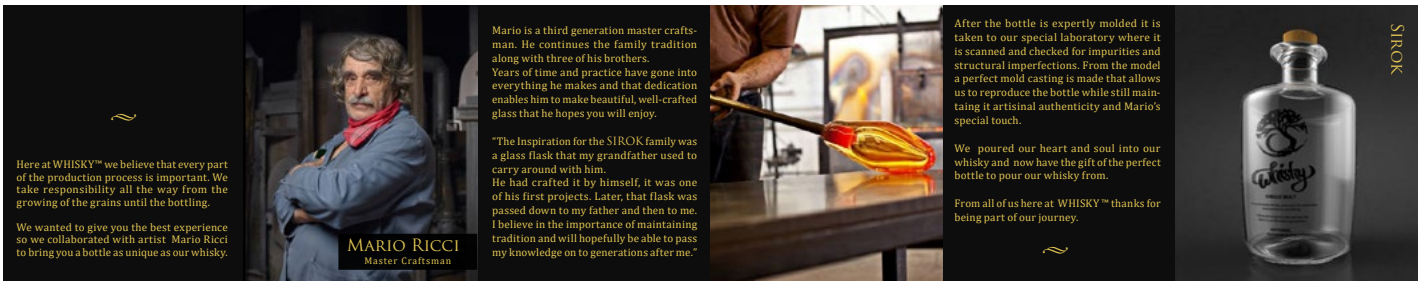
Concept Presentation and Marketing

My concept was not the design of a bottle but the design of how a bottle could be viewed as craft. It was important to create a story around the bottle from design until it reached the consumer.
In this design project there are in fact 2 different costumers, the company that chooses the bottle from O-I and the end user. In order to present my concept correctly I made 2 different types of brochures. The first would be used to portray the bottle and its background to the whisky manufacturing company. I created 3 stories of Master glass blowers and detailed their design and inspirations. I wanted to show the manufacturer that the same passion put into thier craft was put into these bottles. I wanted to put a person behind each bottle family so as to give it a personal touch.

pic (4, 5, 6)

I also created a small brochure for the end consumer, to be attached to the bottle in the form of a small booklet. It explained both about the master craftsman and their design but also how the bottle was then 3D scanned and produced. This booklet allowed for an extra layer of craftsmanship to be added and asscosiated though pictures and painted the bottles in a romantic light.

Example booklet designed to be attached to bottle. (front and back)



Appendix

Research

https://www.zukunftsinstitut.de/artikel/mtglossar/
https://en.wikipedia.org/wiki/Craft
https://www.boredpanda.com/nature-colors-palette-design-seeds-jessica-colaluca/?utm_source=-google&utm_medium=organic&utm_campaign=organic
https://antiques.lovetoknow.com/Value_of_Old_Bottles
http://www.bottlebooks.com/dating%20old%20bottles/determining_the_age_of_old_bottl.https://blog.keyshot.com/2016/render-liquid-glass-keyshot
O-I Presentations brochures and portfolios

Pictures

(1) https://inglas.net/
(2) https://www.packagingoftheworld.com/2014/10/mi grant-whiskey.html
(3) http://villa-antonio.info/glass-blowing-tools/
(4) https://www.gettyimages.de/fotos/hero-im ages-627469639?phrase=hero%20imag es%20627469639&sort=best#license
(5) https://www.gettyimages.de/detail/foto/japanese-man-in-glass-blowing-factory-liz enzfreies-bild/863158748
(6) https://www.tombunning.com/people/glass-worker-1

C.A.D programs and Hardware

Meshmixer by Autodesk
Fusion 360 by Autodesk
Creaform3d
Keyshot by Luxon
3-D Scanner from Go!Scan3D