

**Utopie Smachht Mirror Proposal**

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## Introduction

Mirrors are simple decorative elements which, over time, have become some of the most essential pieces of household furniture. Mirrors have an ancient history. They were first manufactured in “Anatolia — modern-day Turkey... out of ground and polished obsidian (volcanic glass) about 8,000 years ago” (Castro, 2013). Later, during 4,000 to 3,000 B.C, mirrors were manufactured from polished copper by the Egyptians and Mesopotamians. 1,000 years later, the South American and Central American people made them out of polished stone, and “Chinese and Indian mirror makers crafted them out of bronze” (Castro, 2013). The first modern mirror was invented in 1835 by a German chemist named Justus von Liebig. It was manufactured through a process of applying a thin layer of metallic silver over one side of a clear glass pane. Various innovations were made to Liebig’s technique, which finally led to the mass production of mirrors (Castro, 2013). The importance of mirrors goes far beyond the reflection that it provides. It develops a person’s sense of self and allows them to acknowledge their physical bodies. Mirrors allow people to clearly view changes in their physical features on a daily basis, which is something that only other people used to be able to see. Additionally, mirrors are not just useful as pieces of furniture, they are useful in many other locations and scenarios, such as motor vehicles. All cars, trucks, and motorcycles are manufactured with side-view mirrors, which assist drivers with being aware of their surroundings and greatly improve safety (Wilson, 2019). Today, mirrors are sold in all different types of shapes, forms, and sizes, and are used in a great number and variety of products.

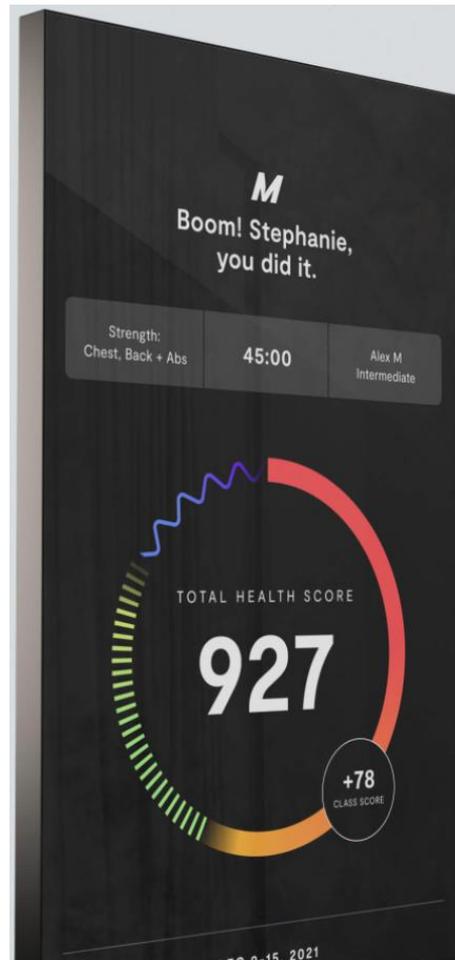
Technological progression has led to innovation in the mirror market. One of those inventions has been the fitness mirror named “The Mirror”. This product has a very indistinctive

name and is priced quite highly (\$1,495 to \$2,045) (MIRROR, n.d.). The mirror contains a virtual character that exercises in order to motivate the mirror's user to exercise with it. It features a sound system, a display, a camera (where people can watch the user), and can connect to a mobile application (MIRROR, n.d.). While this product may be useful to the person who is looking to work out at home, many people might prefer to go to a gym due to the greater availability of exercise equipment.

On the other hand, there is the Utopie Smachht Mirror, the name of which originates from an English to French translation of the word "utopia" (Collins French Dictionary, n.d.). The Utopie Smachht Mirror fills a gap in the smart mirror market, as it allows people to view different versions of themselves. Furthermore, this innovation would be useful in various settings, not just at home, which makes it multifunctional and essential to own.

**Figure 1**

Image of "The Mirror"  
(MIRROR, n.d.).



### Use and Settings of Use

The Utopie Smachht Mirror is a revolutionary product that both businesses and homeowners can take advantage of. By making use of existing augmented reality (AR)

technology, and perfecting it, the Utopie Smachht Mirror can accurately track users' facial

**Figure 2**

Three-dimensional model of Utopie Smachht Mirror (Perepelica, 2022).



features and body structure. This allows users to apply various filters to themselves and view how they would look like with, for example, a different haircut, ten less pounds, a different outfit, etc, as accurately as possible. Technology like this can thrive in places such as barbershops, salons, retail stores, and gyms, as it can help customers with the selection process, as well as encourage them to purchase goods or services, such as clothing or a gym membership. Households can take advantage of this technology as well. Smaller-sized models are created so that consumers can have their own smart mirrors in their bedrooms and bathrooms. The two-way mirror layered over the top of the screen allows for the smart mirror to function as a regular mirror, even with the screen turned off. In addition, the mirror contains lights on either side and can be attached to a cabinet in order for it to function as a regular bathroom mirror. As the technology continues to advance, this

product has the potential to be used in many other settings. However, it all depends on how augmented reality technology changes.

### **Application Description**

A mobile application, which will function as the control for the mirror, will be programmed. The application's main features are to provide a connection between mobile

device, mirror, and camera, and to be able to apply various photo/video filters in real time. The application software will be installed on the Utopie Smachht Mirrors during production and users will download the application to their mobile devices and connect to the mirrors via Bluetooth or Wi-Fi. According to Samsung Newsroom U.S, Samsung smart televisions use an operating system software named Tizen, which is a Linux-based open-source software (2022). Since the software is open source, developers working on the application can freely access, use, and modify the smart television software to easier integrate the application into the system (Opensource.com, n.d.). The developers will also program the application for smartphones. The application development process will incur a substantial one-time fee on the project. Since application development costs mainly depend on the complexity/time requirement of the application, the development of the Utopie Smachht Mirror's application may cost anywhere from \$60,000 to \$300,000 (Spdload, 2021).

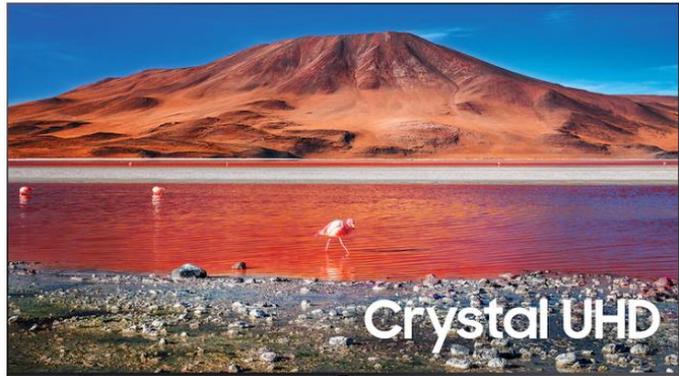
The proposed mirror application contains many similarities to various current applications. For example, smart surveillance cameras use applications which allow a user to connect their phone to the camera. The user can then view the live camera feed, listen to sound through the camera microphones, talk through the camera's speakers, and receive alerts from the camera (Reolink, n.d.). Security camera open-source software, which app developers can use, is available free of charge and contains code for many of the features previously mentioned (iSpyConnect, n.d.). The second software requirement for the mirror is to provide live video/photo filters. Live filers are available with many applications (Free Apps For Me, 2021) and there are many open-source face filter codes available for free download (GitHub, n.d.).

## Materials, Description of Materials

The mirror consists of five major components - the television, the frame, LED lights, camera, and a two-way transparent mirror. The televisions used in the mirrors will be 4k resolution Samsung smart televisions of three different sizes: a 43-inch television for the small sized mirror (Samsung 43-inch, n.d.), a 55-inch television for the medium sized mirror (Samsung 55-inch, n.d.), and an 82-inch television for the large sized mirror (Samsung 82-inch, n.d.).

**Figure 3**

82-inch Samsung TU7000 (Samsung Electronics America, n.d.).



The mirror's frame will be made of PVC plastic and will wrap around the perimeter of the television (Camitlli Cord Hider Cable Concealer, n.d.). The LED lights will be located on two sides of the mirror (SOLLED TV, n.d.), facing in the same direction as the screen. They will be covered by LED cover channels, which will diffuse the light (Muzata 10PACK, 2011). A small camera will be embedded into the top of the mirror's frame (Akaso brave, n.d.). Finally, a two-way transparent mirror will be attached to the screen. This two-mirror will act as a standard mirror, while allowing the television screen images to pass through (SupremeTech, n.d.).

## Building Process and Cost

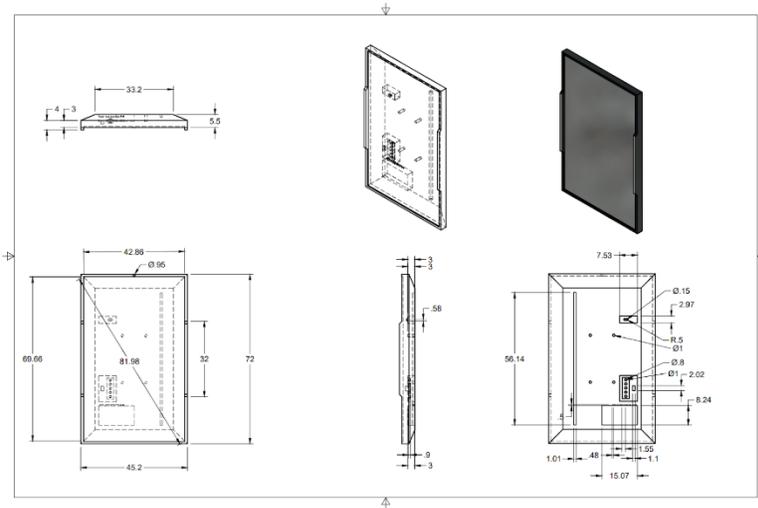
The building process of the Utopie Smachht Mirror begins with the television, which is positioned in a vertical orientation. Then, the frame is designed around the television. The frame

consists of bezels and aesthetic corners. An AKASO Brave 4 Pro 4K30 Action Camera is embedded in the top of every Utopie Smachht Mirror and LED strips are attached to both sides of the mirror, which are then covered by LED cover channels. A SupremeTech See-Through Two-Way Mirror is attached to the screen of each television. All components, apart from the two-way mirror, are attached

using CASAON 570Pcs Self Tapping Screws. The frames, LED light strips, LED cover channels, and two-way mirrors are all cut based on the size of the television. The cost of the 85-inch television is \$1198.00 (Samsung 82-inch, n.d.). the cost of the 55-

**Figure 4**

Blueprint of Utopie Smachht Mirror (Perepelica, 2022).



inch television is \$498.00 (Samsung 55-inch, n.d.), and the cost of the 43-inch television is \$348.00 (Samsung 43-inch, n.d.). The frame costs \$16.00 per mirror (Camitlli Cord Hider Cable Concealer, n.d.) and the camera costs \$104.50 per mirror (Akaso brave, n.d.). The cost of the LED light strips is \$6.88 for the small mirror and \$8.49 for the medium and large mirrors (SOLLED TV, n.d.) and the LED cover channels cost \$3.00 per mirror (Muzata 10PACK, 2011). The two-way mirror costs \$70.00 (SupremeTech, n.d.) and the screws cost around \$0.20 per mirror (Sheet metal screw, n.d.). The overall hardware manufacturing cost for the small mirror is \$548.58, \$700.19 for the medium mirror, and \$1,400.19 for the large mirror.

The final step of the building process and the final cost is the application software. The product has its own functional software which was created to allow the consumer to control the mirror's features by phone, send various files of pictures to the mirror, and use the camera to showcase the filters that the consumer desires. The software has a one-time cost of \$60,000 to \$300,000, depending on the complexity of the software (Spdload, 2021).

### Figure 5

Mirror sizes component price breakdown (Perepelica, 2022).

	A	B	C	D	E	F
1	Item	Cost for Small Mirror (\$)	Cost for Medium Mirror (\$)	Cost for Large Mirror (\$)		One-Time Application Cost
2	Television	\$348.00	\$498.00	\$1,198.00		\$60,000 - \$300,000
3	Camera	\$104.50	\$104.50	\$104.50		
4	LED Strips	\$6.88	\$8.49	\$8.49		
5	LED Cover Channels	\$3.00	\$3.00	\$3.00		
6	Frame	\$16.00	\$16.00	\$16.00		
7	Screws	\$0.20	\$0.20	\$0.20		
8	Two-Way Mirror	\$70.00	\$70.00	\$70.00		
9	Total Cost (\$)	\$548.58	\$700.19	\$1,400.19		

### Conclusion

The Utopie Smachht Mirror was designed to illustrate the perfect version of every person, the name of the mirror alludes to a "utopia". The invention was designed for many settings, such as barbershops, bathrooms, beauty salons, amusement parks, clothing stores and gyms. A major purpose of the Utopie Smachht Mirror is to introduce a futuristic world to a wide audience, since technology has become a major part of society's daily life and as it advances the world goes with it. Using AR technology, the Utopie Smachht Mirror can analyze both the facial and body structure of an individual and apply filters such as outfits, hairstyles, and physical weight. The two-way mirror which is applied to each screen can be used as a regular mirror as well, making

the product accessible and useful to a broader audience. The product has three different sizes (small, medium, large) that can be used in various commercial settings and even in households. The mirror includes software and mobile application, which allow the consumer to control the mirror through Bluetooth or Wi-Fi connections via phone and share files, pictures, videos, and apply real-time filters.

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### Self-Reflection

I had a great time working on this project, my groupmates were amazing, and we were able to come up with a unique and fun product for the presentation. We divided our work into 6 different sections, and I was assigned to do the Building Process & Cost, Conclusion, and Description of materials (Teamwork) paragraphs. Finding the technical description of the products used was quite easy because we used Amazon and they included every information needed for the project. While I was working on my personal section, I did not find any difficulty, everything went quite smoothly, and I was happy with the result. The only thing that kind of frustrated me was recording myself for the video presentation. I guess reading from a phone screen out loud can be difficult sometimes and I had to start over at least 5-6 times. I would like to give a special thanks to all my groupmates because we worked together to create a blueprint and 3D model of our mirror and I was able to make a nice logo for the presentation. The video turned out to be very creative, smooth, and comedic at times. All in all, I had a lot of fun working on this project and it was a pleasure working with such a great group of people. Our teamwork made it easier for us to assemble all the necessary parts, descriptions, and visual figures for our invention and I think everything turned out to be the way we wanted it to be.

