High Tech Vanity: Efficient Design with the Help of Technology

Cassandra Krul

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Master of Fine Arts
Computer Graphic Design

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Efficient Design
with the Help of Technology
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<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title Page</td>
<td>1</td>
</tr>
<tr>
<td>Signature Page</td>
<td>2</td>
</tr>
<tr>
<td>Abstract</td>
<td>4</td>
</tr>
<tr>
<td>Introduction</td>
<td>5-7</td>
</tr>
<tr>
<td>Design Process</td>
<td>8-17</td>
</tr>
<tr>
<td>Software and Tools, Audience</td>
<td>8</td>
</tr>
<tr>
<td>Creative Process - Scene 1 &amp; 2</td>
<td>8-11</td>
</tr>
<tr>
<td>The Elements</td>
<td>12</td>
</tr>
<tr>
<td>Lighting</td>
<td>13-14</td>
</tr>
<tr>
<td>Animation</td>
<td>15-16</td>
</tr>
<tr>
<td>User Interface</td>
<td>16-17</td>
</tr>
<tr>
<td>Conclusion</td>
<td>18-19</td>
</tr>
<tr>
<td>Works Cited</td>
<td>20</td>
</tr>
<tr>
<td>Review of Literature</td>
<td>21</td>
</tr>
<tr>
<td>Acknowledgment</td>
<td>22</td>
</tr>
<tr>
<td>Thesis Proposal</td>
<td>23-24</td>
</tr>
</tbody>
</table>
On a daily basis, humans execute multiple tasks. With technology becoming more prevalent in our everyday lives, we find it creeping into these rituals. This makes it easier to accomplish many tasks at once. The root of the success of technology is its ability to allow us to communicate in ways beyond a simple conversation. That is to say, means of communication are constantly being reinvented and developed.

With these developments, people are finding creative ways of implementing technology into everyday tasks. For example, many of us start our day by waking up and taking a shower. Following that shower, we accomplish some sort of hygienic ritual, get dressed and we are out the door. So why not make the most of that time and multitask? This is the goal of the HighTech Vanity. This conceptual product gives us a head start to the day. Checking our email while we put on makeup, keeping up with the latest news headlines while drying our hair, and checking our favorite social network site before we head out the door gives us a head start to our day. When we arrive to work we have already subtracted the hour or two that we would have spent doing these same tasks. As a whole, the HighTech Vanity looks to inspire the ever-developing implementation of technology into our everyday lives.
The incorporation of technology is seeping into our lifestyles in many mediums. Multi-tasking is the goal of every successful computer operating system. Being able to check e-mail, pay bills, talk with friends and watch a movie at the same time is not unheard of.

Computers, which were once just a tool in the work place have now become a commonality in many homes. The ability to afford a personal computer in the comfort of your home has jump started the technology revolution. Because of this, a variety of personal computing devices have been developed. The iPod, for example, continues to change the way we manage and listen to our music.

Information is important to us, and getting it quickly and efficiently is our priority. Mobile phones alone have pushed the boundaries in the way that we communicate. What once was a device that allows for just phone calls now allows us to check our email and navigate the internet. With a growing dependence on the internet, the advancement of these devices is continuously progressing.

Another medium in which we see technology being implemented is in our automobiles. The presence of an in-dash computer allows for GPS navigation, handsfree phone calls and home monitoring services. Once again, technology allows us to multitask.

Advances in the way we interact with these devices has helped encourage their use. The birth of the computer mouse by Douglas Engelbart in 1963 started the revolution of user interaction (Gillies, James and Cailliau, Robert). Following its release, numerous improvements to the mouse have been made. Multiple buttons, the elimination of the
track ball and the ability to use it wirelessly are just a few. This device allowed for the common user to interact with their computers with no knowledge of programming.

Fast forward to the present, and we see the prominent use of touch screen technology. Although the mouse has been the primary device to control an interface, the personal satisfaction of touching something and immediately getting a reaction allows the user closer connectivity with the device. Ben Shneiderman of the University of Maryland makes a valid observation that the Fresco of the God's by Michelangelo may have inspired the development of touch screen technology. “Touch screens have an unrivaled immediacy, a rewarding sense of control, and the engaging experience of direct manipulation.” (Shneiderman, Ben)

The mainstream use of touch screen technology began with the release of the iPhone at the MacWorld Conference on January 9, 2007. (History of the iPhone) The iPhone uses multi-touch technology which provides the user an easier experience than previous touch screen technologies. Accuracy and the ability to use two fingers at a time to execute different manipulations became mainstream and soon other manufacturers followed.

As a result of these technologies, I believe we will continue to see technology implemented into our lifestyle. Manufacturers are already using technology in creative ways. Home Automation, Inc. has been developing smart home technology since 1985. A computer system is installed into one’s home to control things such as climate, lights, appliances and security systems. As this becomes more popular, it may well become the standard for new homes.
To blend form and function in the interior design of a room, a company called Hidden Television has manufactured a one-way glass mirror (similar to that of the proposed HighTech Vanity) with a thin LCD embedded in it. This allows for the installation of electronic devices in such places as in bathrooms and living rooms. Aesthetically, the mirror hides a typical television in the home.

These few examples support the idea that the incorporation of a multitask bathroom vanity will some day be an item that can assist with a busy, modern lifestyle. Touch screen technology and the ability to access information before we’ve even left the house will help prepare us for the rest of our day.
Software and Tools

The bulk of the project was created using Autodesk Maya. Texturing, user interface elements and additional artwork were created using Adobe Photoshop and Illustrator. The final composite was done using Adobe After Effects. The 3D rendering agent used was Mental Ray using physical sun and sky as the primary source of lighting. The music in the piece was composed using Apple GarageBand.

Audience

Primarily, the target audience of the HighTech Vanity is technological savvy working women ages 21-45. That is not to say that men would not benefit from the capabilities of this product. As this technology becomes more popular it would be an interest to business owners such as high end hotels and bar / restaurants. This would offer both a marketing outlet and element of intrigue for its patrons.

Creative Process - Scene One

When approaching the actual design of the bathroom I wanted to show a contrast from old to new; cluttered to efficient. In Scene one the overall design is based around a typical 1960's style bathroom. Color and lighting set the stage of this style. Moss green was a popular color at this time, so deciding to use this as the basis for the less efficient bathroom was obvious. In order to catch the eye of the viewer, text was incorporated in the opening scene. Providing text within the environment makes the viewer both read and explore the visual. It also introduces the viewer to the problem statement.
Texturing for this scene was very important. I wanted to create something that had a cluttered feel, but still had a tasteful style. A lot of time was spent deciding on how the textures should look in relation to each other and the lighting. Initially the sink top was formica with a basic drawer and cupboard base. After seeing the overall design of the room I was not pleased so I changed my direction that included ceramic tile. This added more dimension to the room. The texturing process was extensive in terms of laying out UV’s and then painting the custom texture. The custom texture was plugged into the color value of a Maya MIA texture. The addition of a traditional basin tub with the same texture treatment helped to visually tie the sink together with the rest of the room.
Instead of keeping the walls all one color I wanted to add yet another element to make it feel more cluttered by using wallpaper. Vintage pattern wallpaper was my inspiration so I created a custom repeatable wallpaper texture in Photoshop.

Creative Process - Scene Two

For Scene 2 my main goal was to create an open airy space that allowed for a lot of natural light to come in from the windows. Particular attention was applied to the treatment of the glass texture for the seamless sink which was inspired by modern bathrooms. I wanted to make the glass as realistic as possible, yet still pay attention to the amount of reflectivity in the scene over all. Because I used Maya’s mental ray mia_x shader, the modeling had to be perfect or abnormalities in reflections and/or refractions would occur. A lot of time was spent testing out different modeling techniques. Refer to Appendix A for images of the progression.
The Elements

The elements on the sink itself are what give the scene character. They create that sense of a busy lifestyle making it relatable to the viewer. When deciding what elements to include I looked to my own bathroom for inspiration. Multiple hair care products, makeup and hair styling tools like curling irons and hair dryers seemed to be commonplace for many women. All of the elements besides the hair dryer were created using polygonal modeling. Because of the organic shape of the hair dryer I choose to model it using NURBS and then converted it to polygons. Many of the elements were then custom textured either using a procedural technique or texture map. In order to save in render times of the elements themselves I tried to stick with Maya shaders. In the case of the hair dryer I constructed a procedural shader that contains a facing ratio node to give it more of a polymer style texture. The reflections are based on the direction of the camera lens so when the camera passes you get a lacquer style finish.

Reflectivity was a concern of mine throughout the texturing of the elements. Too much reflectivity became overwhelming and also added to my render times. Creating textures with various finishes allowed for there to be differences between elements.
Lighting

The process of lighting the scene involved a lot of trial and error, both with the textures, and with the particular light setup. Design choices were also taken into account to deviate the first scene from the second. For the first scene the goal was to create a hazy dawn feeling, but with the second scene I was looking to achieve just the opposite effect - a bright sunlit room that had no dinginess to it.

Maya’s physical sun and sky with final gather was the obvious direction in order to create a realistic lighting result. For the first attempt my setup included the basic physical sun and sky setup with one directional light. Because the scene was an actual room with four walls no light was getting into the room. The only light seen was the light outside through the windows. Adding regular lights on the inside of the room only canceled out the effect of the physical sun and sky. I researched different setups and found that connecting multiple area lights to a mental ray infinite light node allowed for light to spill into the room. The downside was that it didn’t appear to be as realistic as I had hoped (fig 1). The intensity of the lights didn’t vary in a realistic way. The shadows just seemed to be the same density and didn’t have a diffused falloff effect as in a realistic light setting. Adding additional lights such as point lights to high-light certain areas became an issue. Because of the
amount of reflections in the scene, especially the mirror, the lights became visible in the
reflections. (fig. 2) I went back to researching a different setup and found that using a
portal light node in conjunction with the area lights produced the best results. (fig. 3 &
4) It allowed for greater control over
the direction and amount of light
coming through the windows.

To give each scene the appropriate
warm and cool effect I adjusted
both the Multiplier and Haze setting
on the physical sky node. (fig. 3 &
4) More haze gave scene 1 that
dinginess I was looking for and vice
versa for scene 2.
**Animation**

An animatic was essential in planning the timing and flow of the animation as a whole. A total of 14 camera setups were used to accomplish each desired movement. For stable pan and zoom movements I used plain cameras. The hovering movements seen in Scene one used a camera with an aim up and point. Although the animation of the aim and point camera was much more time consuming the desired result was reached.

Animating the separate elements was done using a custom motion path for each object. Motion paths were an obvious choice because it allowed for various animation of many elements within a set keyframe range. A lot of time was spent making sure that elements didn’t run into each other. One problem that came about was when CV’s on the motion paths were spaced awkwardly leading to quick changes in the motion of the element on the path. Because of the sheer number of elements, multiple playblasts from different camera positions had to be created to correct these occurrences.

The cords attached to the two curling irons and hair dryer added another layer of complexity to the animation. Initially the use of Maya hair dynamics was used to give the cords a realistic hang and drag feel to them. Although it appeared to look realistic
it didn’t have the same consistency as how a cable would actually look. The movement was too fluid and controlling the bend and movement of the cords themselves became more tedious. To allow for control over the animation a bone structure was added to the geometry. Clusters were implemented to easily animate the cords.

User Interface

When it came to choosing the style of the user interface, I wanted to maintain a modern style with the creation of simple icons and a consistent color scheme. Designing each icon inspired the use of round corners and simple sans serif fonts in coordinating panels on the mirror. The color scheme consists of desaturated primary colors and the use of grey instead of black.

Planes that would hold animated textures were animated in Maya to act as placeholders for the actual interface elements. This allowed for easy isolation of these separate elements. The contents of the panels were first created in Illustrator with
certain elements on separate layers. Putting elements in layers in Illustrator allowed for easy isolation in After Effects for animation. Animations from After Effects were then rendered out as Targa sequences for the particular set of frames for that camera movement. These sequences were then fed into a shading network for each panel in Maya. Finally, each panel was rendered separately out of Maya with the appropriate camera movement to be composited back in After Effects.
Conclusion

There is no telling whether there will be a demand for this particular product but it does allow for us to explore the possibilities of such a product, were it to exist. Technology appears to be becoming more and more a part of our lives. The prominence of smart devices in society are a good clue as to where we are heading as far as how smart devices are helping our day to day tasks. Advances in home design with the development of smart home technology is a clear indication of the direction we are going in.

No longer do we see just one television in homes across the country; nor do we frequently see one computer being shared by an entire household. Personalization is very important to us. Teenagers are getting their own computers separate from their parents. We all want our own personal devices to customize to our liking. Because of the incorporation of a customizable user interface in this vanity concept, I believe that it will be more attractive to the user. This device also allows for further development by programmers. Allowing programmers the flexibility to create an application that suits them or a particular consumer would enhance not only the usability of the device but offer expandability.

Incorporating other appliances like the smart home system with the vanity as a whole would allow for more central control over the home. Things that are specific to the bathroom would be able to be controlled through the vanity system but also be hooked into the mainframe of the house. Because you’re connected to the internet, monitoring your home could be done through a number of devices, such as your smart phone, computer, your in-car interface, et cetera. The possibilities are limitless.
In conclusion, this project has taught me not only technical skills but has influenced me to think about the future of communication. It will be interesting to see where we are in the next twenty years. The advances in cell phone capabilities in the last five years alone have been tremendous. Technology and design are similar in that they are always evolving which is what has driven me to take up this project.
Multiple techniques were used in the creation of the sink found in Scene one. Combining a square form with a circular form with resulting quad geometry deemed a challenge. In the end, the combination of a plane with the same surrounding poly count as a half sphere allowed for seamless geometry. Finally, the application of an MIA glass shader was added.


Advanced Maya Texturing and Lighting, Book
Lee Lanier ©2000

Although this book is out of date it still provides a good reference to common lighting and rendering techniques. This book was very helpful when it came to rendering, texturing and lighting.

TOI-Pedia, Website
http://wiki.bk.tudelft.nl/toi-pedia/Main_Page

TOI-Pedia is a digital repository of course material, tutorials and software documentation related to the application of ICT in Architecture, Design and education. This website was a great resource when dealing with the architectural Mental Ray textures in Maya.

Digital-Tutors, Website / Online Learning Database
http://www.digital-tutors.com

Digital tutorials started as a large collection of 3D application based tutorials that you could purchase on DVD. In the last few years they have migrated all their source materials to an online database. For $45 this website offered me total access to any 3D tutorial needed. It also has a large online community with people who also work in 3D and offer help and suggestions to posted questions and comments.

AREA, Website / Online Community
http://area.autodesk.com/

Area is Autodesk's version of an online community of 3D artists. This was another great resource when wanting answers to particular questions while working through some rendering issues.

Dwell, Magazine

Dwell magazine was my top resource for all things innovative and modern in terms of interior design. Both the articles and the ads provided for many inspirations for the designs in my bathroom.
First, I would like to express my sincere gratitude to Daniel Deluna, Chris Jackson and Maria Schweppe for their ongoing guidance and patience. Through their teachings I have been able to accomplish great things both in this project and in the future of my career. Secondly, my parents, Frank and Irene Krul. They have always supported me in every decision that I have made throughout my life. Finally to my friends. Collin Ayers and Jamie Anderson, thank you for the use of your computers for rendering over the course of 2 months. Without you I wouldn’t have had an animation. Ali Pensero, Sarah Chatterton, Robin Westlund, Courtney Sampson, Andrew Dadekian, Brendan Bond, and Drew Suppa, thank you for all the emotional support. I love you all.
Abstract

Every day humans execute numerous rituals throughout their day. With technology being more prevalent in the everyday life we find it creeping into every aspect of the tasks that we carry out. Technology provides for efficiency especially in terms of communication. These accommodations are becoming more known and are also being applied in other mediums. Cell phones provide for vocal interaction between humans no matter what their location. Personal digital devices such as the iPod allow for the storage of thousands of songs to be then played back in any location. These are just a few examples of innovations that have come into this digital age to provide some sort of convenience in our daily tasks. Although males have been the prominent users of these devices, women are now becoming more tech savvy.

Marketing strategies such as manufacturing these devices in numerous colors such as pink, being the most prominent in 2006, have opened the technology realm to a different audience, women. As a result the web contains many sites that are devoted mainly to just women who are interested in technology such as, www.shinyshiny.tv. Shiny Shiny, as it’s called is a technology web based blog that began in March 2004 by a British based company. It was the first technology blog site that was written by and for women interested in technology. The site not only highlights numerous technology devices in pink but also innovative solutions mainly for the everyday woman. Most women follow a consistent regimen before beginning their day. This may include blow drying and styling their hair, applying make up, checking email, weather and the traffic reports. This frenzy of tasks can be made more efficient by providing the woman with a central workstation that uses technology as a means to accomplish these rituals. This project aims to elevate the stress of these daily rituals through technology and innovation. The result will be a vanity designed appropriately to accommodate each task.


Project Description

Audience

The intended audience for this targets working women ages 16-55 who do such tasks as applying makeup, style their hair, checking the news and using technological devices such as cellular phones and the internet.

Design

I will design a multifunction vanity that will aid in the numerous rituals of women. Spots to accommodate curling irons, blow dryers and cosmetics along with LCD screens to display a computer interface are a few features of the vanity. The overall design visually will be simple in line and use a combination of materials such as stainless steel for the over all structure of the vanity.

Implementation

The vanity will be modeled and animated in Maya and then composited in Adobe After Effects to create a one and a half-minute advertisement that highlights all aspects of the vanity.
Survey of the Literature

Vanity Setups
These are examples of different kinds of vanities used in bathrooms. No technological devices are in these vanities.

http://www.luxaris.com/vanities.asp

Hairdresser Workstations and Accessories
Hairdresser workstations contain the spots available to hold all the utensils such as brushes and hairdryers. These sites act as inspiration for the vanity.

http://salon.wimexbeauty.com
http://www.shopequip.co.uk
http://www.highperformancebeauty.net/cart/

Computer Workstations
Setups of control rooms using computers and numerous screens act as inspiration for the technological facets of the vanity.

www.innovant.com
www.apple.com
www.dell.com

Marketing Plan

My marketing plan will include posting my progress on my website, www.cassandrakrul.com/thesis so that prospective clients or motion graphic design firms can see my work ethic and progress with the technical and design challenge set before me.

Other software for supporting materials and art work will consist of Motion and Final Cut Pro.