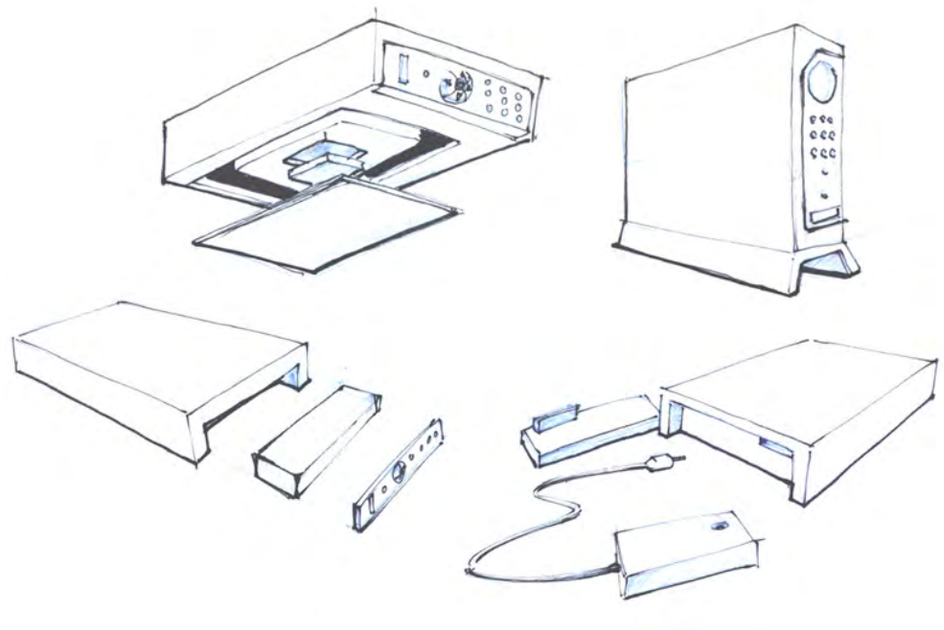
DVD Player Design

Component	Fashion Life	Tech Life	Fatigue Life	Notes
1 Chassis	N/A	50+ yrs	50+ yrs	Main structural component. Must not contain aesthetic elements. The one component that is likely not to be replaced.
2 AV Link	N/A	7 yrs	20 yrs	Limited by changes in format. Opportunity to use biodegradable or highly recyclable material.
3 Buttons PCB	N/A	15 yrs	7 yrs	Limited by fatigue. Technologically linked to changes in format. Design user interface to be adaptable to future changes in technology. Suggest use of "nondiscript" interface.
4 Processing PCB	N/A	15 yrs	50+ yrs	Limited by changes in format. Opportunity build in updateable subcomponent to increase tech life.
5 Disc Drive	N/A	15 yrs	25yrs	Limited by changes in video storage format. Must provide ability to replace with new format technologies such as hard drives or new disc formats. Opportunity to use biodegradable or highly recyclable materials.
6 Network Link	N/A	25 yrs	15 yrs	Opportunity to make component more durable. Attempt to increase fatigue life to 25 yrs.
7 Power Supply	N/A	50+ yrs	15 yrs	Use more durable or modular component. Consider using external power supply that can be easily changed to cope with future power needs.
8 Fascia	3 yrs	50+ yrs	50+ yrs	Limited by changes in fasion trends. Opportunity to build-in emotional modularity through modualr aesthetic. Must not have structural function. Bio-materials.
9 Battery	N/A	15 yrs	3 yrs	Limited by fatigue. Recommend standardized & proven battery size and type that can be easily changed and recycled
10 Remote Control	3 yrs	15 yrs	7 yrs	Limited by fashion. Main user/product interactive element. Technologically linked to changes in format. Recommend simple, timeless aesthetic. Use "nondiscript" interface.

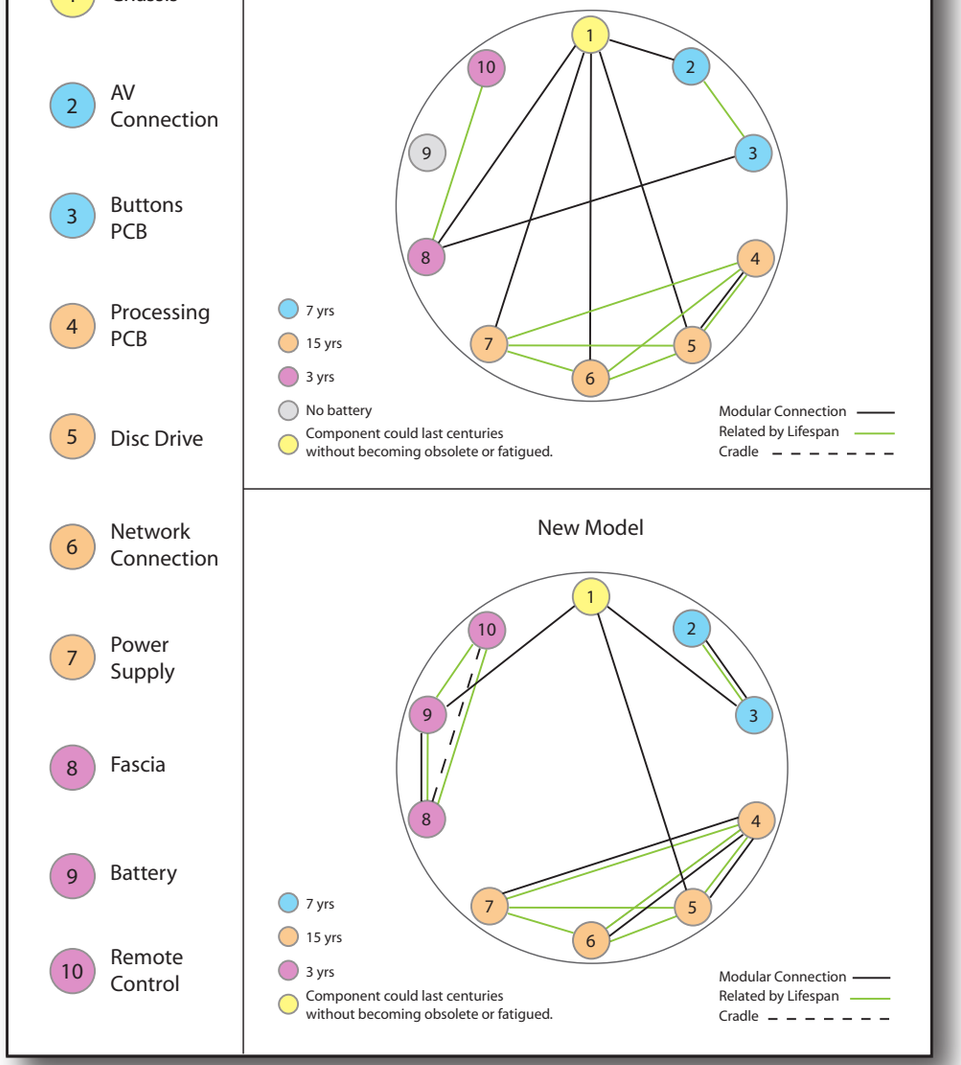
Component Lifespan Chart

Using methods developed during my thesis study, and outlined here, each component was evaluated based on anticipated lifespans in a "component lifespan chart." Opportunities to optimize the lifetime of each component were suggested.

The individual components were grouped by color based on their estimated lifespans.



Component Relationship Wheel



The information from the component lifespan chart was used to generate a "component relationship wheel." Components with similar lifespans will be grouped into assemblies for replacement during the same maintenance event.

Sketches were made to illustrate the modular design direction. The modular design allows for the easy replacement of certain components, allowing the user to replace only the needed components, rather than the entire unit.

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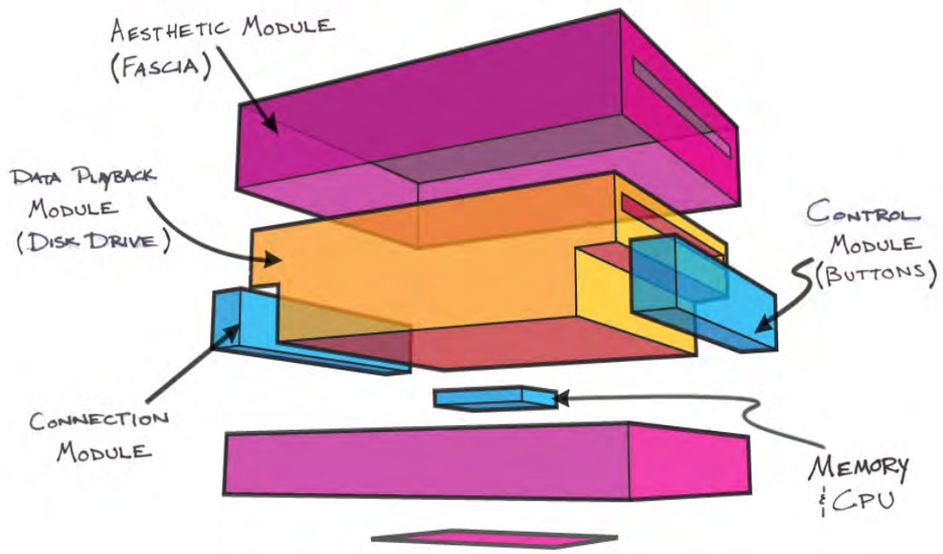
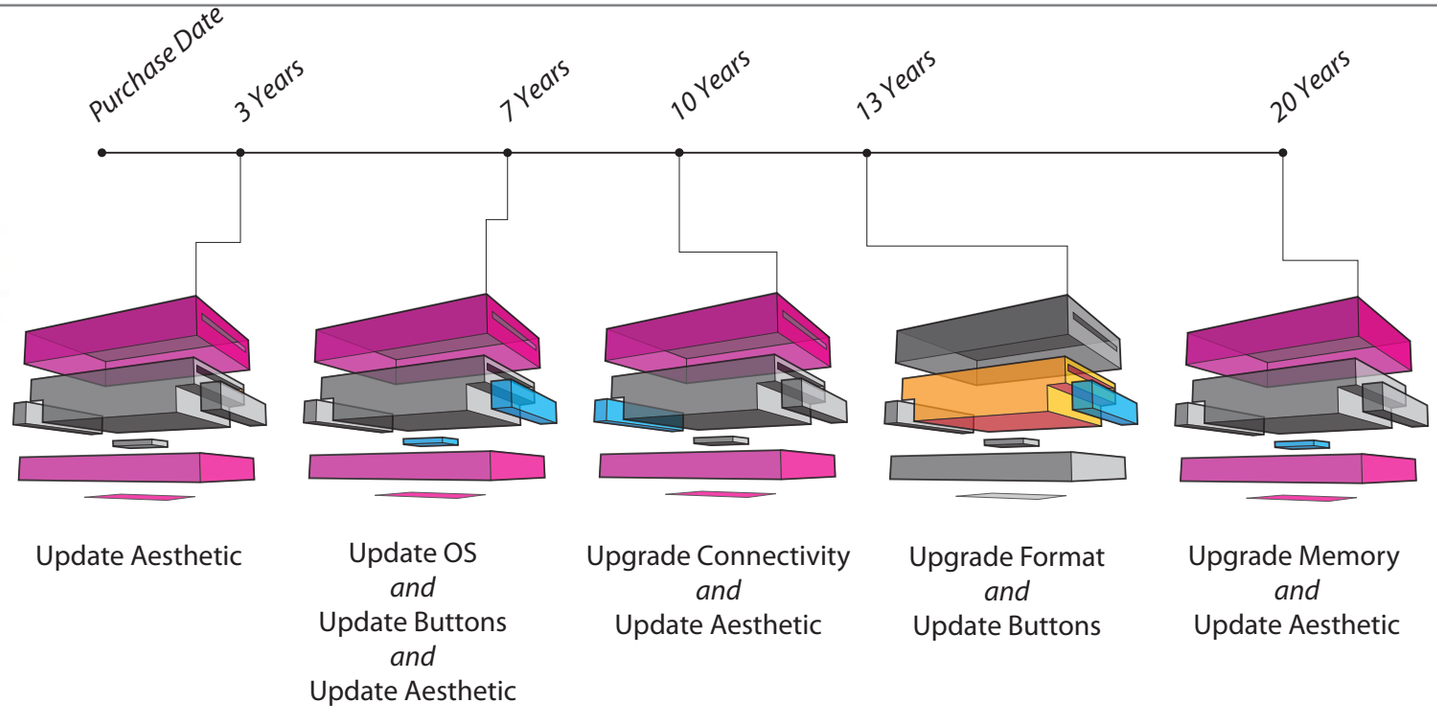


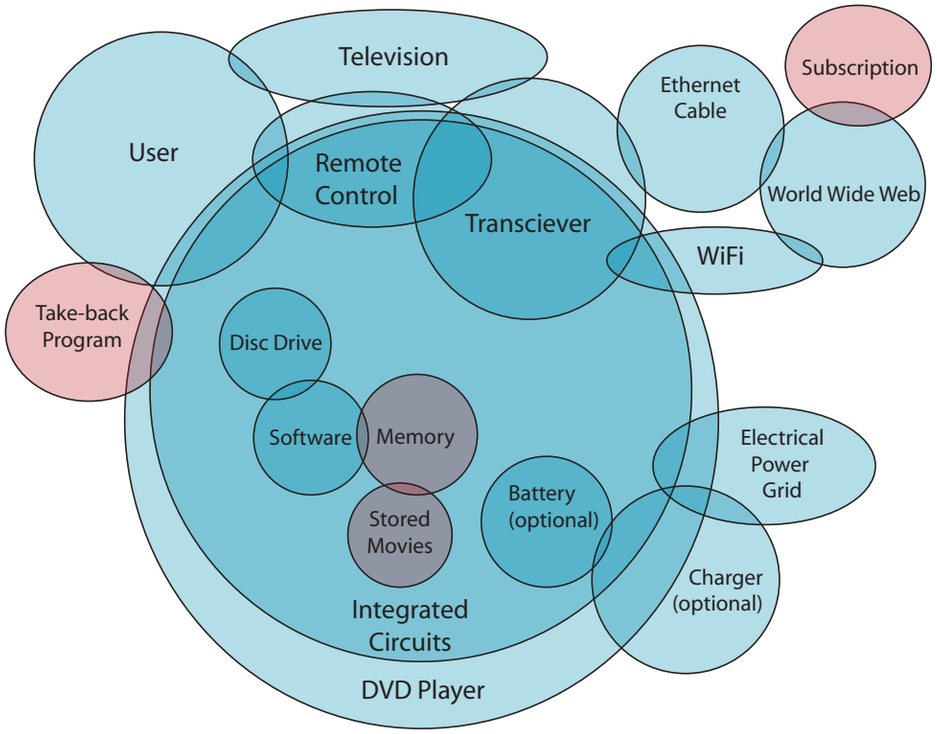


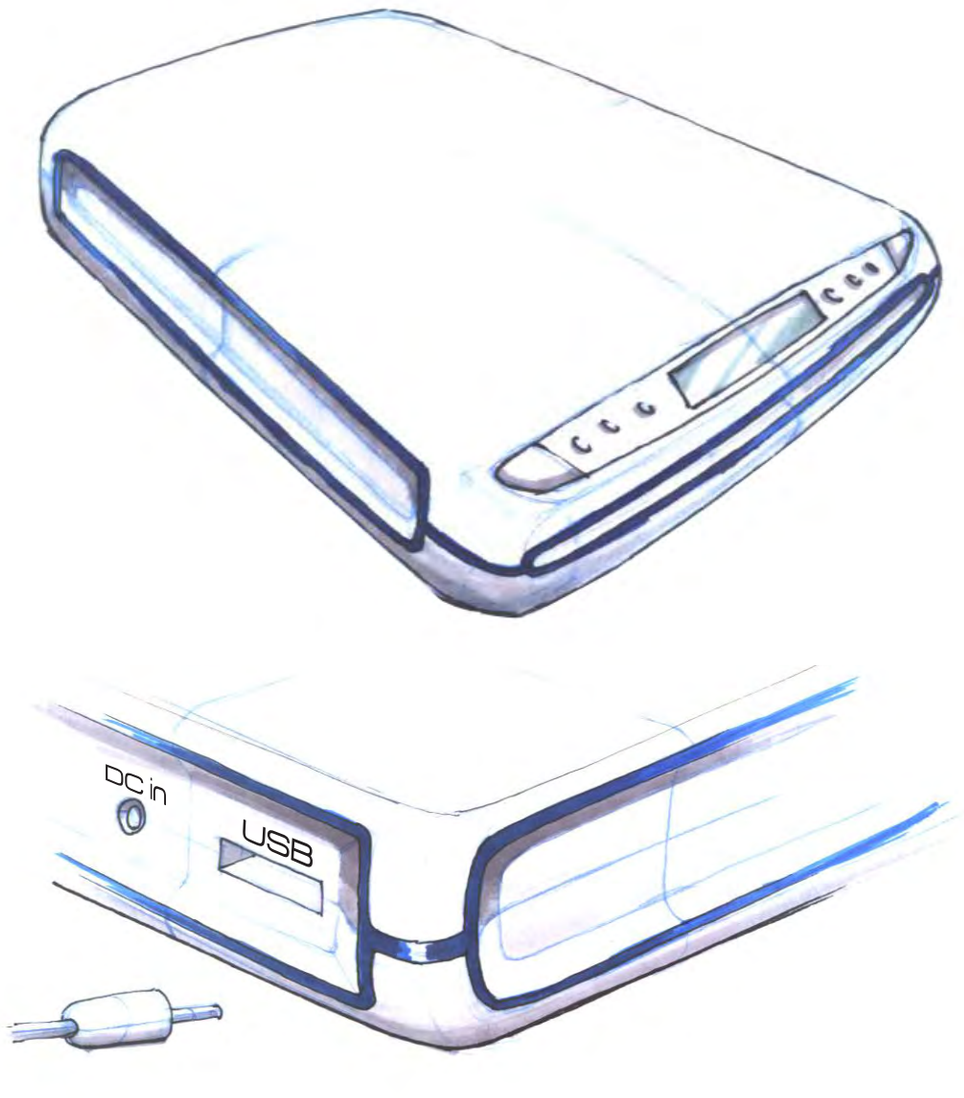
The Venn diagram below illustrates opportunities for "transmaterialization." The orange areas indicate opportunities to meet user needs with a service, rather than tangible components.

Results from the sketches, Venn diagram, and relationship wheel led to the creation of a "frameless" product architecture unique to the industry, illustrated in the exploded view above.

A hypothetical timeline was generated to illustrate to the client how the maintenance schedule might play out over a given time period.

Some form sketches were generated to show the final design direction.





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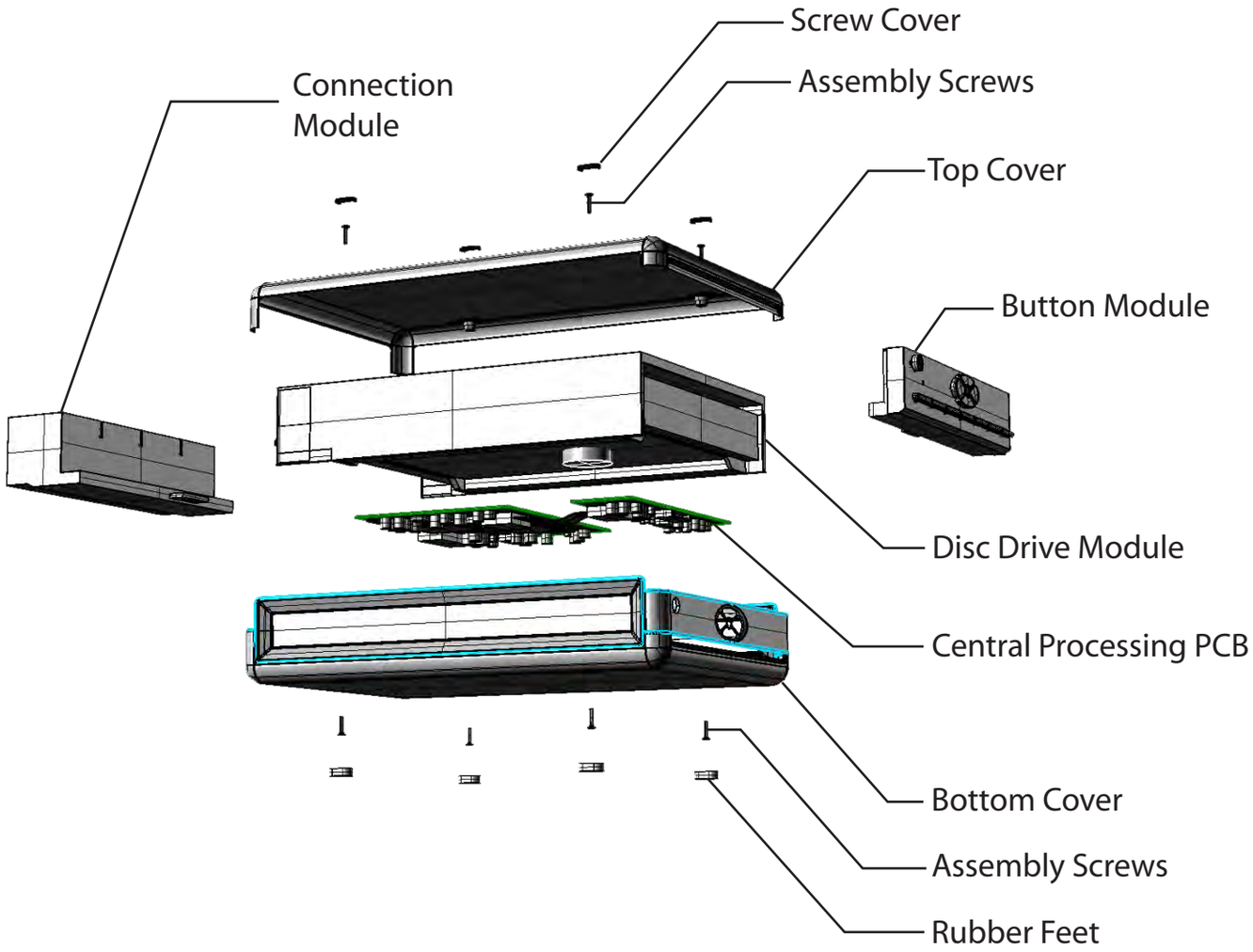


The player features a unuque product architecture in which modular complents are attached directly to the main structural disc drive module.

The power supply is an external DC power adapter using standardized parts common in the electronics industry.

The central processors and other associated circuitry are accessible for subcomponent updates when the fascia is removed, allowing for extreme modularity using “everday” tools.

Ribbon-type connectors will link circuit boards to other components for easy replacement.

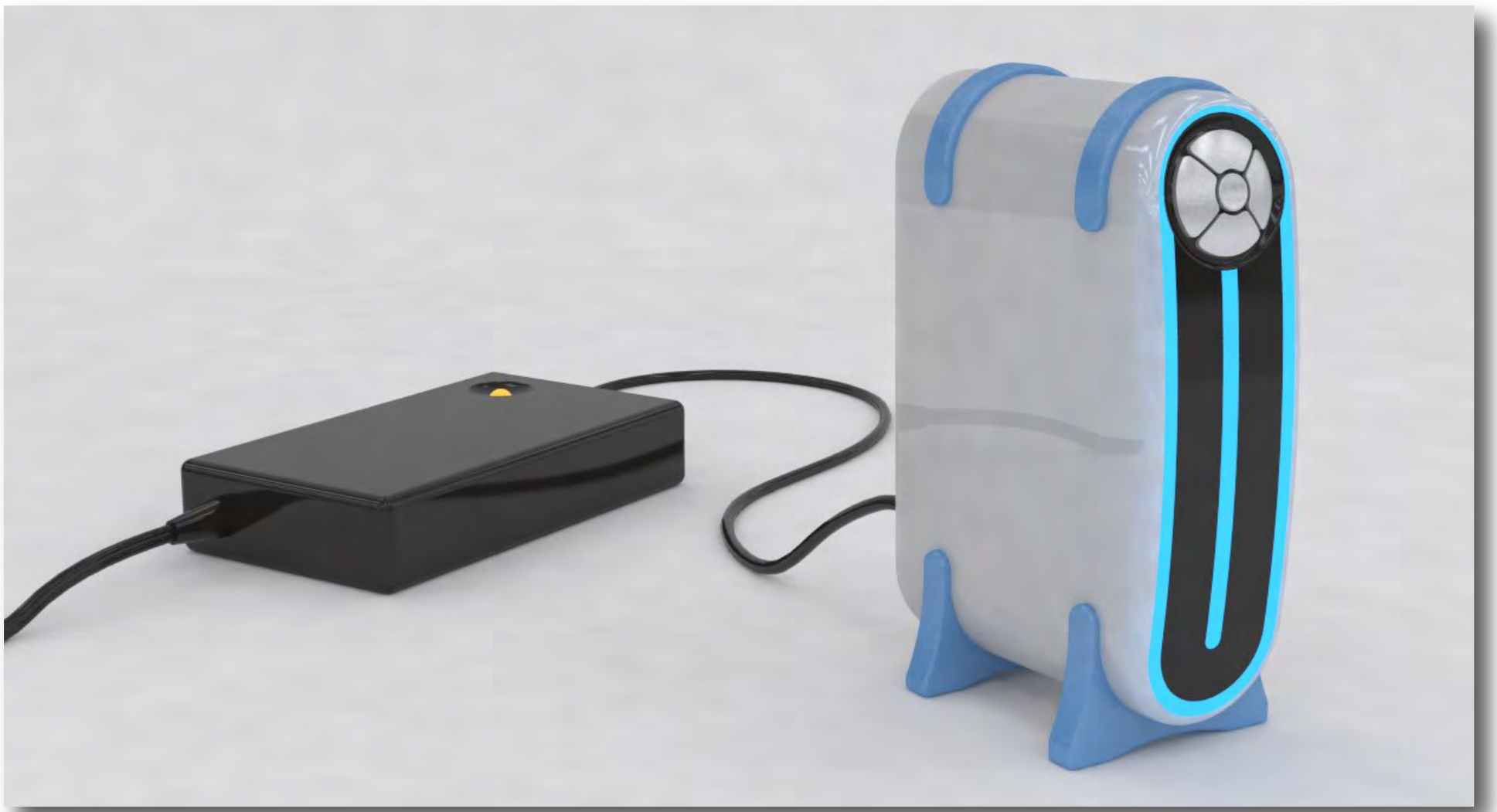




The product accomplishes an updateable aesthetic by utilizing an inexpensive, easily removed, low-impact fascia. It can either be ground into new stock for future molding, or simply be incorporated into new units. In this way, the fascia can serve as a viable technical nutrient in a "cradle to cradle" cycle.

Further upgradability and personalization is available through multiple choices of connection modules. These modules can be easily replaced if the user purchases new video or audio equipment needing higher quality connections.

More functionality upgrades will be available in the form of an easily-accessed central circuit board. The processing PCB will be easily accessed for change with simple, "everyday" tools such as screwdrivers. Ribbon-type connectors will link circuit boards to other components for easy replacement.



Perhaps the most versatile application of modularity will lie in the operating system software. Stored on a flash memory device, the software can be re-written, giving the DVD player a new graphical interface, and new color and graphic themes to be displayed on the monitor.

Finally, the disc drive itself can be replaced to accommodate changes in format, such as a change to Blu-Ray, or a shift away from disc players to that of hard drive storage and playback.