

Designed To Feel Good

How Rapid Visualization Improves Product Design

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A successful product is the sum of its parts, from solid internal engineering to a sleek, attractive exterior that speaks to the consumer on an emotional level. Using “cool” new technology is a great way to maintain a competitive advantage, but the playing field for audio products is being rapidly leveled out due to emerging R&D and manufacturing capabilities overseas. It is not uncommon for products from different manufacturers to share almost identical feature sets. In such cases, one of the best ways to defend your brand is to differentiate your products through innovative industrial design.

Design Distinctions

The industrial design process incorporates a variety of methods and skills to develop a product from beginning to end. Designers follow a careful and analytical process, and use design distinctions to measure results. Typical distinctions are:

1. Usability
2. Functionality
3. User-friendliness
4. Aesthetics
5. Creative inspiration
6. “Feel-good” quality

Creating a design that satisfies the above criteria involves research and conceptualization of consumer needs, both perceived and latent (subconscious). Good design can effortlessly express the key benefits of the product, creating that instant “aha” feeling of understanding and appreciation, and ensuring that the product will sell itself. The four steps below help the designer arrive at the final concept with maturity and confidence. In this paper, we will illustrate the process using the example of designing a guitar pedal product, taken from an actual case study.



Research

This section refers to what's called "behavioral research." A good designer spends time researching the product and its user environment before coming up with the first concept. In fact, we can't overemphasize the importance of qualitative and quantitative consumer research. It's surprising how much the industry doesn't know about the consumer, even though many developers claim to be experts on their products. Being a consumer of your own products is useful but is insufficient when trying to understand the mind of the "statistically average" customer. Designers must spend time following users around and noticing their behavioral patterns.

In the "Rapid Visualization" section below, we show some preliminary sketches for a conceptual guitar processor device. For this project, we have studied how guitar players use their effects processors at home and on the stage. We've collected data on the types of shoes worn by guitar players, and their shoe sizes. We've measured the desired travel of the volume pedal. We've researched the preferred product size and weight across several cultures. We've brainstormed ways to protect the unit from a spilled drink during a live show. We experimented with the sizes of controls, to make sure they are visible to a tall person from a standing position. We developed ways to associate the product with cultural icons. We've considered the emotional aspects of using a guitar pedal to enhance one's sound. All of this was done to develop a differentiated product.

Analyze

Qualitative consumer research yields descriptions of the customer environments. The following are typical questions that are answered:

1. How does a person use a product?
2. How does he or she prefer to set it up?
3. What issues are commonly encountered by novice or experienced users?

Quantitative research enables statistical analysis of user groups and gives the researcher an idea of the "average behavior" in a group. It's useful for estimating market sizes. At this stage, repeated interviews are conducted and focus groups are assembled to ask questions and demonstrate ideas and prototypes. All of the data analyzed helps to paint a portrait of the user.

Visualize

When talking to consumers about a new product or service, designers need to help them quickly visualize the idea. There are several ways to perform rapid visualization. The proliferation of computer technology has changed the landscape of design, allowing designers to capitalize on graphic and engineering software capable of creating intense, ultra-realistic renderings. However, young designers often fall prey to the siren song of computer applications, unaware that the age-old practice of pencil-and-paper sketching is still the solid foundation for all design. The ability to sketch and visualize concepts rapidly still plays a critical role in the design process, enabling the client and the customer to view concepts and ideas before committing valuable resources to a project.

Computer-aided tools can be a tremendous boon to the designer if utilized effectively. Modern design programs can effectively showcase a concept by presenting an ultra-clean, professional image that a hand-drawn rendering is unable to provide. Ultimately, the best design firms are those that offer both capabilities, bridging the gap between technology and the pencil and paper, and incorporating each skill to enhance the other.

Preliminary Sketching

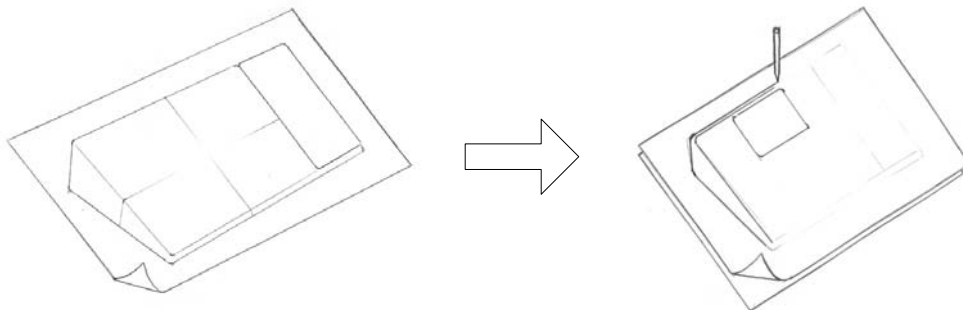
Sometimes the best ideas are born not during brainstorming sessions, but in unexpected situations outside of work. A smart designer is always learning from his or her environment. The ability to capture the essence of the idea is often dependent on the nearest materials at hand, such as a scrap of paper or a cocktail napkin. Rapid sketching techniques make a solid first impression on a client during a lunch meeting, since a flurry of ideas is being exchanged in the conversation. This technique also allows for a great deal of give-and-take between the design firm and the client, as the client can immediately comment on the design.



Preliminary sketches

Underlay Rendering

For more traditional concept generation, sketching is used when designing a product. Designers may employ several different methods during this phase, but the most popular and effective is the "underlay" method. An underlay is particularly powerful because internal mechanical components are laid out roughly, with approximate dimensions, and an outline is drawn around the internal components. Next, the designer purchases a large packet of translucent vellum or tracing paper and gets to work on outlining the concept. The purpose of an underlay is to flesh out ideas and concepts quickly for the overall "look and feel" of the product, without paying too much attention to detail. Tracing paper is loose and easily shifted, and so should be the sketch that is drawn on it.

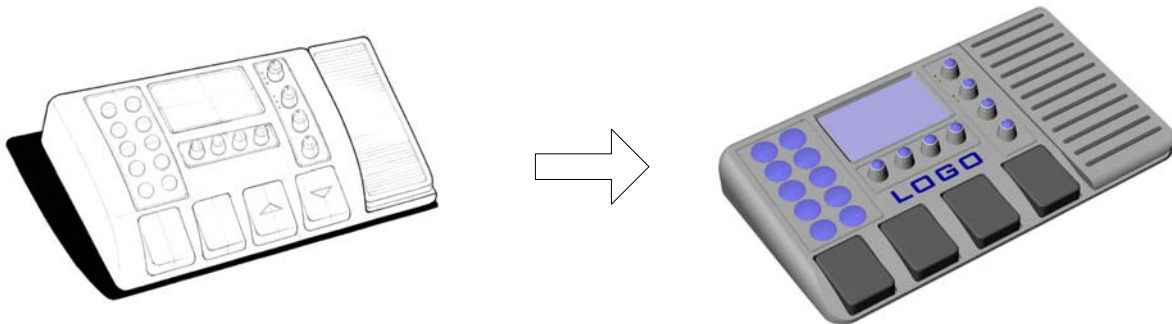


Underlay sketch

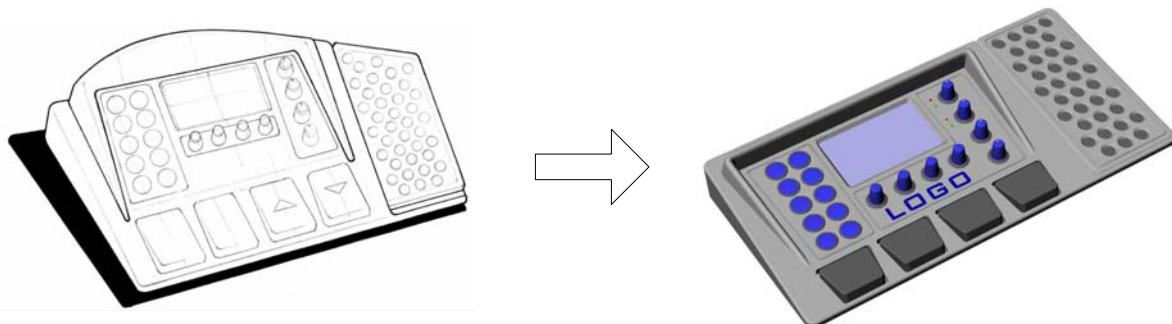
Underlay sketch with blank tracing paper on top

Near, Mid, and Far Concepts

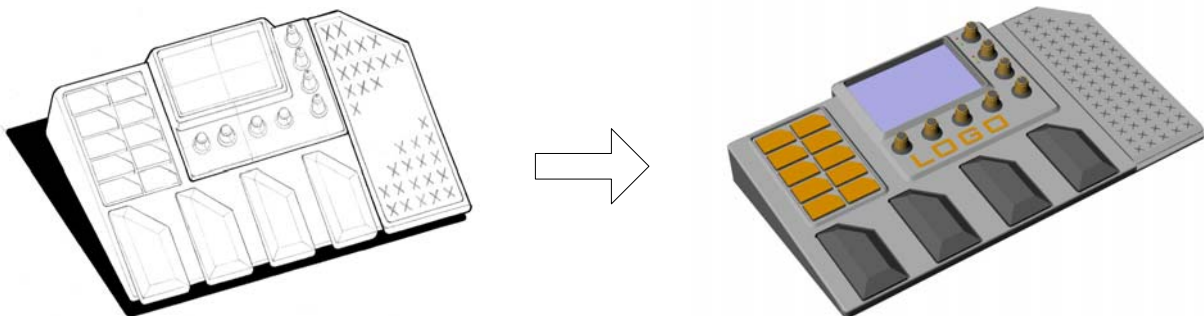
After the underlay sketches are drawn, they should be laid out or placed on a wall, and examined as a group and individually. This allows the designer to note trends or themes in the sketches, and to place the sketches into different groups or families according to distinct design traits. This typically results in three design concepts: "near," "mid" and "far" designs, with the concepts ranging from calm and safe to aggressive or outlandish. This layout shows the client the unique characteristics of each product group. Each concept is typically given a name to reflect its "personality." Examples are shown below together with the resulting computer renderings.



1) Near Concept: "Hello Kitty"



2) Mid Concept: "Solid, Dependable"



3) Far Concept: "Street Race"

CAD rendering

As shown in the pictures above, hand-drawn sketches are transferred to rendering software. The designer uses 3D modeling to create the wire-frame, from which the rendering is subsequently built. The CAD program can present a concept at its best, with clean, crisp lines and smooth shadows that no hand-drawn rendering can provide.

Verify

After the layout is complete, the client views different concepts and then comments, noting desired changes or favored aspects of the design. This exchange of information is important because it helps the designer develop and refine each concept until the result is acceptable. During the early stages of product development, the client usually desires to see several completed designs, each with its own independent appearance and style. The design process is not complete until the target audience (customer or client) is fully satisfied with the results.

Conclusion

Design is constantly evolving and adapting to changes in society and the environment, and the changing skill set for designers reflects this. While recently emphasis has been placed on the value of technology and graphic programs, designers must take care not to let fundamental abilities go to waste. Sketching has always been an important aspect of design and will remain important in the future. However, if drawing and concept-generating abilities are paired with a powerful CAD tool, the results can be impressive to both the designer and client. The rapid-visualization process allows clients to experience concept generation and to view product designs before committing themselves to costly model-making or rapid prototyping.

Industrial design is quickly becoming the differentiating factor between a run-of-the-mill product and an outstanding, successful product. The right combination of product usability, functionality, creativity, aesthetics, and user-friendly design allows a company to pull away from its competitors and defend the brand by making attractive products.

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