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Design Utility Improves Product Functionality

Industrial designers create and develop concepts and specifications that optimize the function, value, and appearance of products and systems for the mutual benefit of both user and manufacturer.

**By Jeff Mulhausen
and Gray McCord**

AUSTIN, TX.—Why are most of us willing to pay \$3 for a cup of coffee at Starbucks when we can pay a fraction of that price for a practically identical product somewhere else? The reason is not that the quality of Starbucks' coffee warrants the price differential, but that the experience and emotions that come with purchasing from Starbucks are worth the premium.

Starbucks is a corporate leader in understanding that its customers' experiences determine how much they are willing to pay for coffee. Thus, Starbucks invests heavily in designing its stores, the operational efficiency of fulfilling orders, and the peripheral merchandise that embodies the Starbucks lifestyle. While all these initiatives require capital investments, they are paying off in spades. Starbucks' return on investment is 11.12 percent compared with an industry average of 7.24 percent.

The experience with and surrounding a product—more than simply the utility

of the product—has emerged as the driving force behind increased economic value for industry-leading companies such as Starbucks. Product development firms are partially responsible for introducing this approach to clients and helping them to envision and design the entire experi-

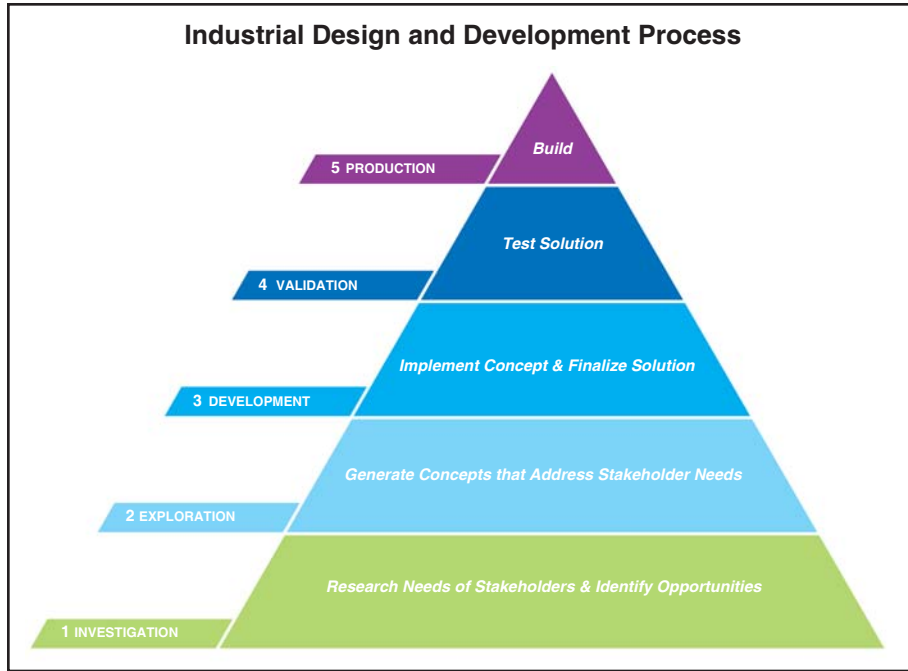
ences of their customers. This article is dedicated to explaining the philosophy of experience design and how it can add significant value to the oil and gas industry.

The Industrial Designers Society of America defines industrial design as "the professional service of creating and devel-

M3 designers Mike Hankins and Paul Kramer are shown in the field with a new seismic control truck designed from the perspective of the crews who operated it. Developed for harsh environments, work surfaces were reconfigured by function, hard edges were removed, computers and advanced communications were embedded in the truck, and redundant systems and equipment were eliminated. All these changes increased the comfort and operational efficiency of the crews.



FIGURE 1



oping concepts and specifications that optimize the function, value, and appearance of products and systems for the mutual benefit of both user and manufacturer.”

Industrial designers are responsible not only for how products look and feel (shapes, colors, materials, ergonomics), but also for leading qualitative research to determine what features a product should have and why it should have them. They are trained to be keen observers and interpreters of how people use products as well as to look at scenarios from the viewpoints of the many stakeholders involved in the product experience. Industrial designers are turning business models on their sides by analyzing and designing every facet of a company’s products, services, and communications to influence customer perceptions and behaviors.

However, this is not to suggest that industrial designers should work alone in designing products. The philosophies, technical training, problem solving, and strategies that industrial designers, electrical engineers, and mechanical engineers possess can lead to innovative new products if they are integrated throughout the various stages of a project.

When multidisciplinary development teams come together to get big-picture perspectives and embrace whole projects from the onset, the result is creative problem-solving solutions and truly breakthrough product development. Clients need to allow these teams the freedom to understand problems and propose solutions in order to yield the desired breakthroughs in their products and services.

The Design Process

Figure 1 shows a hierarchy of the industrial design and development process. It begins with basic investigation and research, and progresses to generating design concepts that address the user’s needs, developing design concepts, validating and testing solutions, and finally producing the final design.

Companies in the oil and gas industry have begun to work with industrial designers and multidisciplinary teams to design their product and service experiences. The challenge for the industry has been how to embrace this type of thinking to fundamen-

tally change the experiential landscape for its customers, employees, and partners.

One industry example of this process was designing and developing an improved seismic exploration control truck, often referred to as a “doghouse.” The primary function of the control truck is to perform as a central hub of command for up to hundreds of workers and thousands of sensors in remote locations.

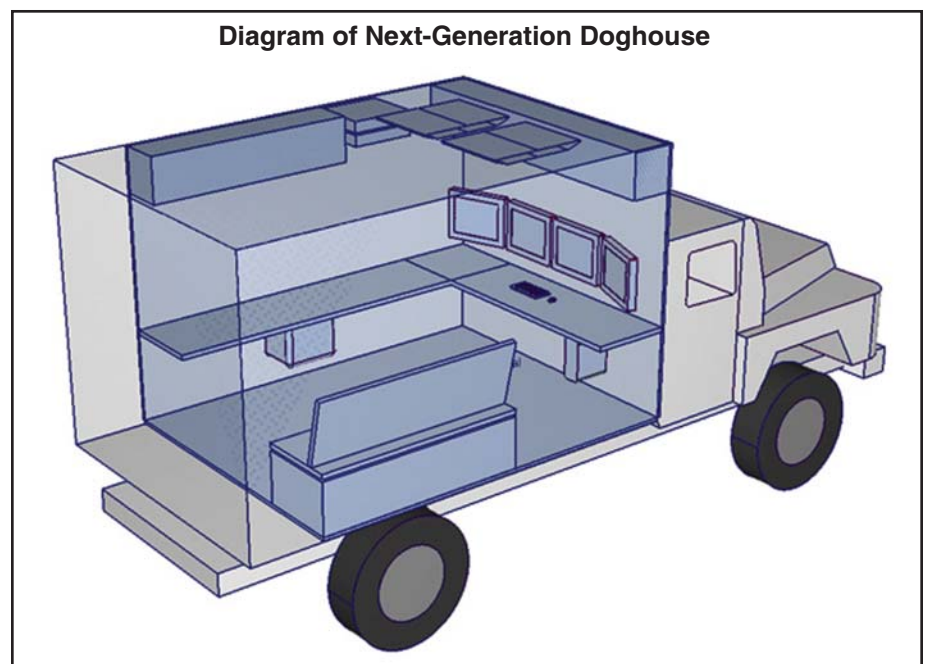
Doghouses are involved in exploration activities worth hundreds of millions of dollars, and are increasingly subjected to challenging environmental conditions as they go farther afield to find new sources of oil and gas. They are thus integral to the growth of the industry, yet have not received the needed attention to explore how new technologies and different design configurations could lead to safer and more efficient working environments.

Among the challenges in designing a next-generation control truck were selecting appropriate new technologies to replace outdated legacy systems, incorporating those advanced technologies into the truck, and redesigning its interior for maximum efficiency.

The design process began by observing crews at project sites first-hand to ascertain how they used the doghouse. The design team observed the crews interacting with the truck and its equipment.

The team found the doghouses to be cramped, hot, dusty and uncomfortable “boxes.” Expensive and sensitive seismic, testing, and research equipment was poorly stored and at the mercy of rugged terrain, causing safety issues during transport for the crews and subjecting the

FIGURE 2



equipment to heavy impacts.

Through this observational research, the design team identified the main challenge of the doghouse project: to make the interior environment more conducive to safe and efficient work processes by the crew. The team saw the opportunity to design a new type of doghouse experience that would incorporate everything the crew needed to maximize efficiency and increase cycle time for recovering and distributing data.

A Better Doghouse

The design team's solution was to create a doghouse better suited to harsh environments and remote locations by re-imag-

ining the entire control truck from the perspective of the users' experience (the crews). The solution reconfigured work surfaces by function, and made the truck safer by removing the hazards of hard edges. Figure 2 shows a computer-generated diagram of the new doghouse design.

Computers, wireless links, and advanced communications were embedded in the truck, which allowed for up-to-the-minute data access and distribution. Redundant systems and equipment were eliminated by designing how devices communicated with each other, thus eliminating the need to have a computer for every function. All these changes increased the comfort and operational ef-

ficiency of the crews, which, in turn, resulted in a significant business success for the client.

From a design perspective, assembling an integrated team of product developers that brings together different, yet complementary perspectives, will yield the most innovative solutions and integrated product experiences. Just like Starbucks has elevated itself above competitors by designing how stakeholders experience the "product," oil and gas companies also can utilize experience design to dramatically improve efficiencies, safety, and their bottom lines. □



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