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The Curious Case of Nissan "Interaction Design"

In Pursuit of a Stress-free Driving Experience

In the recent popular movie, *The Curious Case of Benjamin Button*, actor Brad Pitt went through a unique "reverse aging" process from an old man to young, thanks to intricate special effects and long hours in the make-up chair. When Nissan designers want to undergo a similar aging process – this time from young to old – they simply slip into a specially created "aging suit."

Wearing dark goggles to limit visibility, tapes around the arms, legs and neck to restrict movement, and a pair of sandals with raised toes, the designer sits in the driver's seat of a prototype vehicle, checking the operability of the car. It's all in the name of making Nissan vehicles more user-friendly to drivers of all ages and sizes, and part of an emerging function within Nissan Design called "Interaction Design."

"Thinking Outside the Box" Begins Inside the "Boxes"

Etsuhiro Watanabe

"Everyone ages eventually, you know," says Etsuhiro Watanabe, who is in charge of Interaction Design within the Product Design Department. "The 'aging suit" helps us study how eyesight and physical capabilities compromised by aging affect how a driver operates a car."

Unlike its counterparts in Hollywood, Nissan Design's aging suit was made from existing gears and it is continually being refined. And while the "aging suit" provides a unique perspective of – and appreciation for – the challenges facing drivers perhaps twice their age, Interaction Design team members have many other tools in their quest to perfect the interactions between man and machine.

Nissan Interaction Design: Form = Function + Emotion

The study and design of Human-Machine Interfaces (HMI) based on ergonomics (the study of how a workplace or equipment can best be designed for comfort, safety, efficiency and productivity) is a well-established practice. Nissan has been actively researching human-vehicle interfaces since the 1990s. Watanabe, for example, handled instrument panel design for the Infiniti J30 (Leopard J-Ferry), Laurel and Cefiro, and proposed applying "universal design" in concept cars in the late '90s. While representing Nissan at an international conference on universal design, he began to apply its principles in his design work. Over the past decade, the concept of "universal design" has come into general parlance for products that are easy for anyone to use, regardless of physical limitations.

Shiro Nakamura

Nissan took the universal-design concept a step further in 2005, embracing the concept of "Interaction Design" so that customers will feel that every part of a car works smoothly and attractively. And while creating HMIs is usually Research and Development territory, at Nissan it's a priority of the Design Department as well.

The involvement of both the Design and R&D Divisions in developing universal design is unique to Nissan – with support for these comprehensive efforts coming right from the top, Nissan Senior Vice President Shiro Nakamura.

Nakamura describes Nissan's Interaction Design activities this way: "In the design industry, it's often said that 'form follows function.' Nissan has adjusted this to 'form follows emotion' as a design principle, meaning that we can't create designs that are attractive and exciting to customers unless we think beyond ease of use, put ourselves in the shoes of the user and give a lot of thought to the kinds of feeling we want to evoke in the customer. I believe strongly that it's the mission of Nissan Design to realize this and increase the value of Nissan cars for our customers."

The Elements of Interaction Design and the BUI-2

"Interaction Design," can be divided into three areas:
– Interfaces: Instruments and graphical user interfaces, like navigation systems, door handles, switches, lighting, etc.
– Interior colors and materials
– Perceived quality: Individual part textures, joints between parts, etc.

The R&D and Design departments pay close attention to these factors in the design of every Nissan vehicle. In 2005, Nissan started a project to create revolutionary car interiors that are easier to use, leading to the BUI (Best Usability Interior) concept car.

Above is the second-generation BUI-2, produced in 2006. Nissan is already applying some of the universal-design ideas explored in the BUI-1 and BUI-2 to production models.

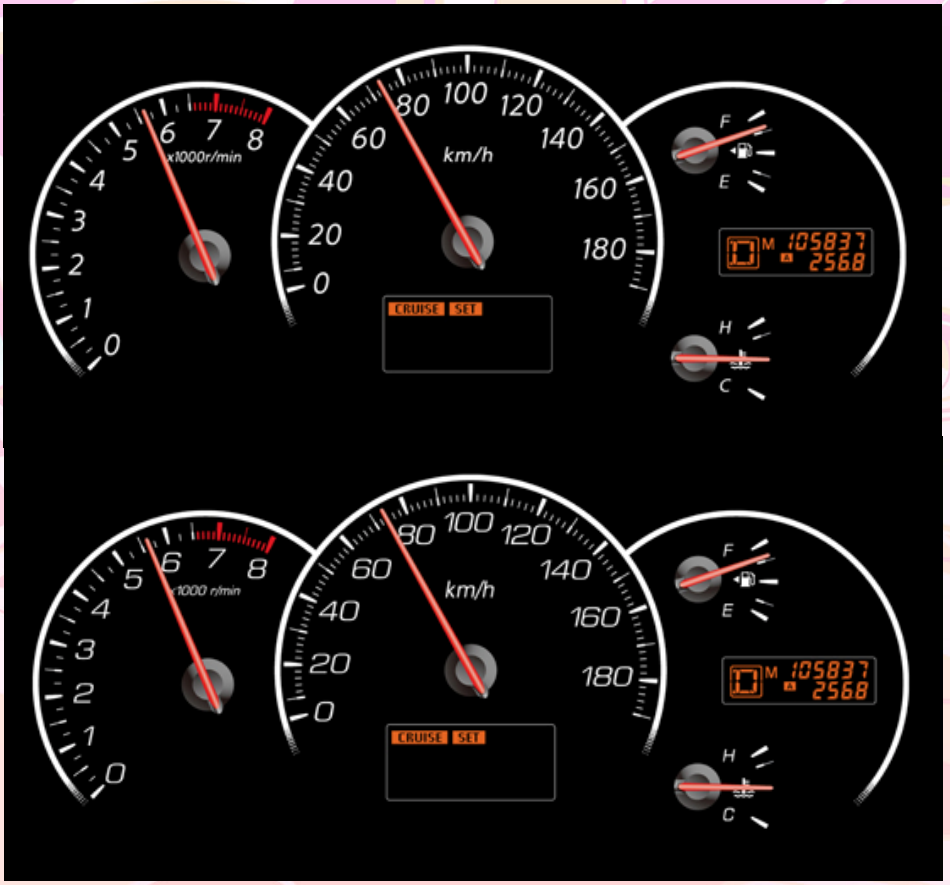
A case in point is door handles. Over many hours in parking lots, our project team observed people entering and leaving their cars, and discovered a difference between men and women in opening the driver's door from the inside. While men tend to pull the door handle with the right hand and push the door with the right arm (right hand drive vehicles), women tend to pull the handle with the left hand and push with their right. That led to new door-handle designs for easy use with either hand, adopted in last year's new Cube and Z® .

Responding to customer complaints of frequent confusion among seat controls, including recline, position and height adjustments, the designers developed a more intuitive seat switch and used it in the new GT-R.

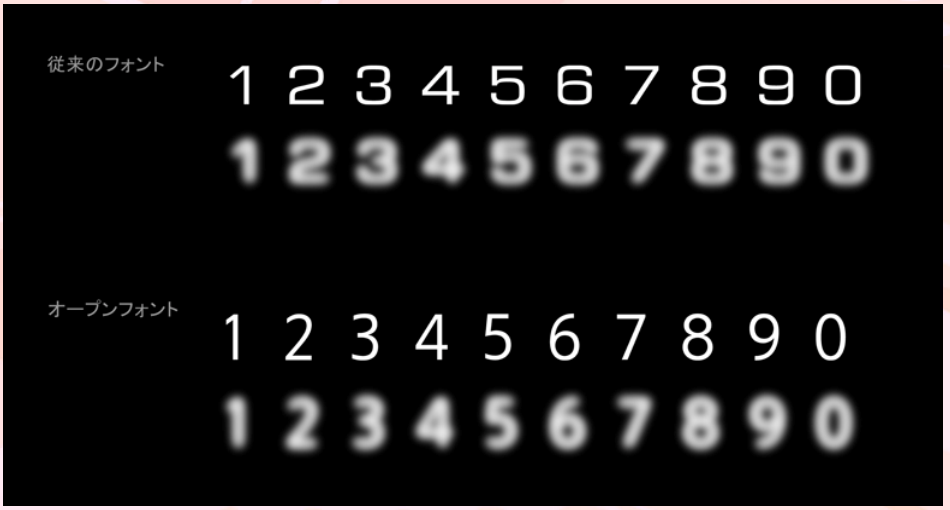
But this is only the beginning. "For the future, 'by-wire' technology will replace mechanical connections from the steering wheel, pedals, shifter and the like with electrical signals," Watanabe says. "This will be a key breakthrough in building revolutionary, user-friendly cars. The interface on the Pivo2 concept is our ultimate goal."

Open Font

Another example is the importance of legible fonts on instruments and gauges. Like most carmakers, Nissan has traditionally used different types of lettering on instruments to best suit the character of that model. But since 2001, the company has been gradually changing those fonts with an eye to usability and perceived quality, seeking the one that's easiest to read. The designers call it the "open font" for its more open shapes, making it easier, for instance, to distinguish between the numerals 3, 8 and 6. The photos illustrate the difference between conventional (bottom) and open fonts (top).



"The difference in legibility is striking when we look at it through the aging-suit goggles. Even if a driver has good vision, it's important that instruments be instantaneously legible at high speed or in night driving," says Watanabe.



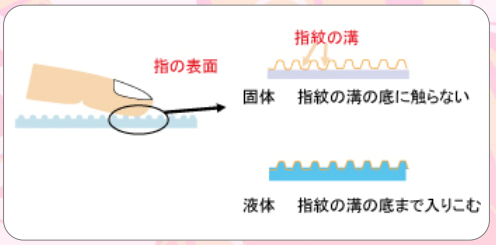
Colors and Materials

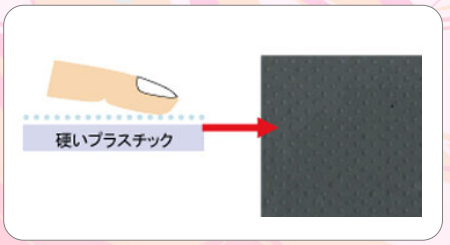
Interaction Design also plays a key role in the look and feel of a vehicle's interior. The perception of colors and materials has as much to do with an interior design as its function. As with clothing, different color schemes in car interiors create different impressions. In the Cube, Nissan applied contrasting color schemes, with dark colors below the waistline and light ones above to make the cabin feel roomier and relieve owners' concerns about dirtying the floor.

The Teana employs lighter colors overall, combined with modern wood panels, to create a relaxing, comfortable cabin reminiscent of a traditional cypress bath.

Bucking the convention of using lighter colors for the pillars and headliner for a more open feeling, the new Z® uses black overhead to create a tighter space in which the driver can concentrate on driving.

Choosing the right materials is another important factor in Interaction Design. The "soft field shibo" texture of the Z□ door handles is a case in point. [Name] Yoshitomi of the Color Design Department explains: "Textures that are finer than fingerprints tend to feel slick. This material has a 'shibo' texture, with about the same frequency of ridges as fingerprints, creating a feeling of slickness. This way we work toward a sense of higher quality."





Source：Utsunomiya Univ.

At Nissan, the study and design of the human-vehicle relationship is increasing important to the enjoyment and safe operation of Nissan vehicles. Getting the details right – whether the shape of a door handle, the numbers on a speedometer, or the touch of a fabric – can make a world of difference in your ultimate driving enjoyment.

So whether you call it Interaction Design, HMI, Function + Emotion or just plain common sense, the next time you slip behind the wheel of your Cube, Z or other Nissan, think about the designers in the funny-looking suit acting twice their age.

Etsuhiro Watanabe
Associate Chief Designer, Product Design Department
Since he joined Nissan in 1980, Watanabe has been responsible for the interior designs of many cars, ranging from mid-sized sedans like the Laurel and Cefiro, to the ARC-X/Kuraza Concepts and the Hypermini electric vehicle. He has been in charge of Interaction Design since 2005.