



DESIGNING FOR THE ROAD AHEAD

When done right, industrial design is invisible. But inspiring a sense of delight and lust from a business laptop that is effortless to use—that takes a lot of work. Ken Musgrave, director of industrial design and usability at Dell, reveals what happened behind the scenes when Dell went to the drawing board to design the new family of Dell™ Latitude™ laptops.

The launch of the new family of Dell Latitude laptops represents a major turning point for Dell. Long considered a technological leader but not a design star, Dell is now unleashing a double threat with its new business laptop line. And at Dell, design is about a lot more than simply making things look good. The way a product is designed is the key to the whole user experience, from the way the keyboard feels under your fingers to what your laptop says about you. That is why Dell has a specialized team dedicated to designing mobile products that are not only attractive, but intuitive and user-friendly.

Ken Musgrave, who leads the Dell worldwide industrial design and usability team, recently spoke with *Dell Power Solutions* about the process of giving the new Latitude laptops—and Dell Precision™ mobile workstations—a sleek look to match the power under the hood.

HOW WOULD YOU DESCRIBE DELL'S DESIGN PHILOSOPHY FOR THE NEW LATITUDE FAMILY?

We wanted to take our design ideals up a notch with this generation of Latitude laptops. We wanted to land a one-two punch—to convey a level of sophistication and simplicity while also delivering an overt impression of high quality. But mostly, we wanted to make the Latitude laptops exciting. We wanted this to be a product that made people feel both delight and lust.

We knew we had to get an emotional response from users. You don't usually think of business products as emotional items—that response has generally been reserved for gaming systems or the premium product in each category. But it's amazing how

important the emotional reaction is when people are forming their impressions of a product, or a brand. And a lot of times, that impression is based on little things. When I push on the palm rest, does it deflect? When I push on the back of the laptop, does it deflect? When I lay my hands on the palm rest, are the keys in the right spot? All those little things are difficult to get right, but they make a huge difference. So that is where we put most of our effort.

Also, because getting an emotional reaction from the user has a lot to do with that first-glance impression, we put a lot of effort into revamping the look of the Latitude line.

WHO WORKED ON THE DESIGN FOR THE NEW LATITUDE LAPTOPS?

We have roughly 100 people working on a variety of products, compared with just 7 in 2001. Industrial design, usability, color design and finishes, packaging, some user interface design, comfort—we have a wide range of specialists working in-house. Our average designer has about 13 years of experience, and we have about 15 Ph.D.'s in cognitive sciences and psychology working on usability.

With psychologists and designers working side by side, we can study things that were considered unconventional in computer design until now. For example, we spend time looking at how people perceive products and how they prioritize their expectations. All of our experts collaborate to bring top appeal to Dell consumer- and business-class products—to help improve the aspects of the products that the customer sees and touches.

HOW DO YOU CHOOSE COLORS AND FINISHES FOR THE PRODUCTS? IS IT GUESSWORK, OR IS THERE A SCIENCE TO IT?

We have a whole team that focuses on colors, finishes, and trims. You'll notice that every technology vendor tends to come out with the same colors at the same time—that's because we're all working with one of three cross-industry consortiums that do color forecasting. Furniture, apparel, automotive—they're all working with the same forecasts. They're all chasing the same color trends, and the consortiums tend to get most of them right.

For example, in early 2000, blood orange was predicted to be a hot color for late in the decade. Everyone thought there was no way this would be a popular shade—but now it is the hottest color around. Any company that is introducing a new car (starting with the 2003 Honda Element and the 2004 Range Rover Sport) now automatically shows it in that color. Dodge just released the Charger in that color as well.

When you come out with a palette of colors, you try to come up with a range that has global appeal. Sometimes a color that sells really well in Europe won't have much appeal in, say, China. And vice versa. But that's the beauty of having the palette—there are options, and people can choose what they like.

ARE FINISHES JUST LIMITED TO SOLID COLORS?

No. We have a technology in our manufacturing process that lets us turn images into one-offs or small runs. It's the same process we use to apply color on the outside of the laptop. We

can also apply the image onto a three-dimensional surface, or add soft-touch paint on top to give it a really nice finish that feels good in your hands.

Another exciting thing we did recently was produce a limited run of special-edition consumer laptops with artist Mike Ming. We've actually done small runs with several artists who have a pop following—so, we might do 2,000 of one design. They sell like mad. They're a long way from gray!

Once we establish our colors, we have to standardize them. We have a facility on-site where we have color analyzers and we create color standards and archive them in the freezer. Our suppliers will submit their matches, and then we test them out to see whether they actually correspond to our specifications.

HOW DO YOU PINPOINT THE FEATURES THAT YOU CAN IMPROVE THROUGH BETTER DESIGN?

When you show something to a focus group, all they can bring to the table is their historical perspective. So we don't just show it to them and ask what they like. We'll describe some of the product attributes and behaviors to make sure they see and understand that. If you design for what consumers want now, you'll be behind their expectations two years down the line, when the product comes out. Their expectations will have shifted. So we aim ahead of their expectations, then lead people to where we think they'll end up. That's why we put so much effort into our forecasting and trends, our advance design work.

Dell engages with about 1,000 users per year in our world-wide usability labs. We test everything extensively—from

BRINGING LATITUDE TO LIFE



Step 1: Dell designers create rough sketches to define multiple laptop concepts, based on the Onyx design language.

Step 2: Designers refine key structural details through iterative sketching processes.

“If you design for what consumers want now, you’ll be behind their expectations two years down the line, when the product comes out. Their expectations will have shifted. So we aim ahead of their expectations.”

keyboard performance and server maintenance processes to wireless connectivity and systems management. We have four full-time, in-house labs. The intelligence that we gain from our usability studies is what gets translated into the design of the product. But it’s not as simple as asking users what features they want added to the laptop. Often customers don’t even realize they are doing something that makes up for a deficiency in a product. So when our usability experts see subtle compensating behaviors over and over again in different users, that’s where we find opportunities to improve the product design. The trick is to pay attention to the right cues so we can identify needs that users have, but can’t necessarily articulate.

The point stick—that eraser head that sits in the keyboard and lets you move the pointer on-screen—is a great example. Over the course of two product redesigns, we changed its shape from being an “outie” to an “innie.” The button has gone from being a rigid, hard eraser material that amplified all

your finger movements to something that helps buffer finger movements. Softening the pointer movement helps make for a dramatically better experience.

ONCE YOU KNOW WHAT USERS NEED FROM THE LAPTOP, HOW DO YOU TRANSLATE THAT INTO THE PRODUCT’S LOOK AND FEEL?

When we start thinking about the look of a product family, we use what we call design languages.

These are like visual style guides. They bring together visual elements that tie together products of similar design and similar value propositions.

Car companies are a good illustration of how a design language works—when you see a BMW 3 Series or 5 Series sedan, or a BMW X3 or X5 SUV, they’re obviously different cars, but you always know that they’re part of the BMW family. Design languages also help continue the heritage from previous product generations.

When you develop a design language, you need to think about what characteristics you want to convey. We recognized that the Latitude line has a masculine kind of persona. And from a design perspective, power is something that has always been conveyed through very muscular forms. The Latitude laptops from two generations ago were designed to evoke overlapping muscle and tendons using organic shapes. The most recent ones evolved into something a little more restrained, with more flat



Step 3: Concepts edge closer to reality and photo-like quality through the use of high-resolution software rendering.

planes. And the new Latitude laptops convey a crisp, precise sense of masculinity. It is a refined version of the aesthetic from two generations ago.

We created a design language called Onyx for this generation of Latitude laptops. Onyx uses a lot of primary, rectangular shapes to create a simple yet capable feel, and we put a lot of emphasis on grouped information and control elements. We tried to make innovation more apparent through tactile and visual features like flush screens, touch controls, and hardware such as latches and hinges. Onyx uses subtle contrasts in color, material, and textures to convey sophistication. We also kept our detailing very precise—almost militaristic—to communicate no-nonsense professionalism.

Latitude is the first glimpse into the new direction we're taking for the industrial design of our upcoming enterprise products. Our new blade servers also have a similar look and some of the same detailing, both on the exterior and under the hood. For example, we spent as much time on the detailing and latches on the back of the blade server chassis as we did on the front.

WHAT DESIGN CHANGES CAN WE LOOK FORWARD TO IN THIS GENERATION OF LAPTOPS?

On the new Latitude laptops, we've gone to a much cleaner, tighter geometry. We moved the battery to the back to help make expansion easier. We have ports in the back and the side. And the 13-inch model, the Latitude E4300, is a really nice form factor—it's the smallest display you can get with a full-sized keyboard, but it's big enough to have the thermals to support

a full-sized processor. And it's significantly thinner and shallower than our previous-generation 13-inch models.

We put a lot of effort into building on the features that already worked and revamping the ones that didn't reflect the qualities we want Latitude to project. For example, our keyboard was already viewed as the gold standard. Customers thought it was a really solid component. So in our usability studies, we tried to build a clear, comprehensive list of every attribute that should be part of a best-in-class business keyboard—then we zeroed in on how to deliver those qualities for the future product. We approached every feature within the laptops as if it were its own complete product. We paid attention to how things work individually, as well as together.

One of the coolest things we created is a special trackpad for Dell Precision mobile workstations. When you toggle it on, it'll actually have a scroll wheel in it, for people who do linear editing. There will be some programmable function keys, and you'll be able to do high-speed or low-speed linear movements. It's a small, specialized feature, but it makes a huge difference for the user experience.

We also redesigned the accessories. The docks, for example—in the past, you would dock your laptop and use this big platform with a huge monitor on top of it. But flat-panel monitors are light and dynamic and airy, so we got rid of the bulky platform and monitor. The new dock integrates a flat-panel stand on it.

We've taken some steps to add consumer appeal to business-class products. For example, instead of wrapping metal hinges in plastic, as we have in the past, we actually made the hinges a



Step 4: Foam models are carved to show the general size and shape of the selected concepts.



Step 5: Various hard models of subcomponents are crafted to demonstrate key design attributes. In this case, hinge models show the design progression from previous-generation Latitude D-Family laptops (background) to the new Latitude E-Family laptops (foreground).

design element. We gave them a brushed metal finish that shows off the quality of the hardware. We aren't hiding them anymore—we are bringing them out and making them very overt, very apparent.

We expect that these types of design changes will make Latitude laptops appealing for college students, young professionals—anyone who cares about their equipment looking cool. We want to make it look less like a corporate-issued system so people can have some personal expression in a professional work environment.

We're even going beyond the product line itself. We've redesigned the whole Latitude bag line. We realized that we had put all this effort into making our laptops as light as possible, but the bags were adding extra weight—so now they're designed to be lighter and thinner, with sleeker lines than our previous laptop bags.


HOW ENVIRONMENTALLY FRIENDLY IS THIS GENERATION OF LATITUDE LAPTOPS?

We're working on making our systems smaller while delivering the same power and capabilities that are available in bigger systems. And our long product cycles can be good for the planet—there's a tremendous amount of ecological benefit in reducing the amount of waste from discarded laptops. We're also using recyclable materials wherever possible, from sustainable plastics to natural compounds.

“Dell's long product cycles can be good for the planet—there's a tremendous amount of ecological benefit in reducing the amount of waste from discarded laptops. We're also using recyclable materials wherever possible, from sustainable plastics to natural compounds.”

WHY DID DELL CHOOSE NOW AS THE TIME TO GIVE LATITUDE LAPTOPS A WHOLE NEW LOOK?

Enterprise users are starting to take more of a consumer attitude toward the technologies they use to do their jobs. They are drawing on their own knowledge of devices they have either personally experienced or have heard about through family and friends. This means that people are approaching workplace technology with a completely different set of values and expectations than in the past.

Our team recognized that user experience wasn't exactly Dell's strong suit in previous years. Customers saw the Latitude product line as competent, but completely free of any emotion. Our product design didn't reflect our world-class engineering. They didn't get people jazzed. So when we sat down to redesign the Latitude laptops, our fundamental goal was to create products that not only incorporated Dell technology innovations, but also delivered an exceptional, exciting user experience. 



Step 6: Full-scale hard models are built to guide selection of the final designs, clearing the way for the Dell engineering teams to finalize the internal components.

Step 7: Production Latitude laptops roll out of Dell manufacturing facilities and into the hands of customers.