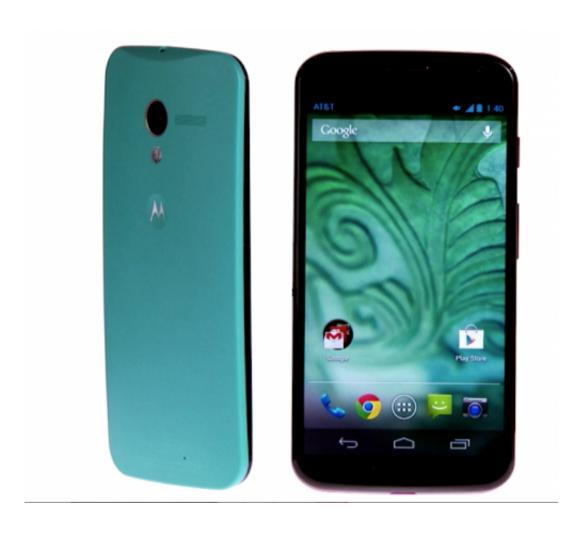# Moto X born of new attitudes at Motorola Mobility

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Paul Pierce remembers the reaction his team of designers elicited from their engineering colleagues when they proposed a smartphone with a

gently curved back that would nestle into a person's hand.

"We didn't take it as a negative, but they were literally laughing when they saw the concept," recalled Pierce, Motorola Mobility's director of industrial design for the Moto X, the first flagship phone to come out of the company after it was acquired in 2012 by Google for $12.9 billion.

Pierce and the designers loved the natural feel of the rounded device, but the engineers saw a guffaw-inducing challenge: How would they fit a multitude of tiny, rectangular components into a curve without wasting space?

As it turned out, overcoming that engineering conundrum for the Moto X set the tone for solving another vexing problem at the stalled technology giant: Jump-starting a creatively inert culture that, through years of painful restructurings and cuts, prioritized cranking out dozens of products to meet nitpicky technical requirements rather than coming up with groundbreaking ideas. In setting out to reclaim Motorola's long-lost position as a dominant player in mobile technology, designers and engineers were given one directive: Think big.

Reshaping a corporate culture, particularly at a company like Motorola with 85 years of history and thousands of employees, isn't done overnight or through a single product launch. Even so, the Moto X marked a turning point for the Libertyville, Ill.-based company, one that the team hopes will spur the company's rebirth.

"It wasn't like Google bought us and all of a sudden (said), 'OK, guys, let's work on this new thing, we've got this great idea,' " said Joe Allore, the lead product architect for the Moto X. "No, it wasn't like that. Maybe this is old-school thinking, but I was expecting a little of that. If anything, the expectation was higher: Step back and look at ourselves and set our own expectations for what we wanted to do and make."

The burden on the Moto X and its successors is enormous. Motorola, which produced the first commercial portable phone and once had a top-seller with the Razr, is clinging to barely 1 percent of the global smartphone market. The team behind the Moto X wants to show that Google didn't just buy a lucrative patent portfolio with a money-losing hardware manufacturer attached to it, but rather a company capable of producing cutting-edge technology that appeals to consumers worldwide.

"We had the opportunity to create a new story, one that had more mass appeal," said Jim Wicks, senior vice president of consumer experience design.

The Moto X, which was introduced last month and is available at all major carriers, took about a year to develop. Wicks and Iqbal Arshad, senior vice president of engineering and global product development, were given wide berth to design the device from scratch and concentrate on that product.

The single-minded focus on the Moto X was a sharp contrast from pre-Google Motorola, which made more than 40 phones a year for wireless carriers in different geographies. The pace left little time for thinking holistically about a device or collaborating with colleagues from other teams. Instead, employees were on a treadmill of fulfilling carrier-dictated technical specifications.

"For those of us who have been around Motorola for a long time ... there's a creative DNA that's in us to innovate," said Jason Wojack, a 16-year employee who heads the company's product architecture team on the engineering side. "When we got stuck on this churn through so many products, we lost a little of that. (The Moto X) allowed us to get back to that focus and pull that creativity back out. We have some of the best engineers in the world, and we leveraged that to use them in the right way."

Trimming the product pipeline allowed Wicks' and Arshad's teams to leave their cubicles and set up "war rooms" where they could spitball ideas in person with employees from supply chain and other groups, a collaborative process they didn't have time for in the past. They also had a live feed to Motorola's Sunnyvale, Calif., office, where they were joined by former Googlers who moved to the acquired company.

The newcomers helped the team question fundamental assumptions about the design and functioning of mobile phones: Do they have to be black rectangles? Why does taking a photo require so many steps?

Processes at Motorola also came under scrutiny. Motorola Chief Executive Dennis Woodside, the Google executive who oversaw the company's integration, wondered why the Motorola corporate system for dialing into conference calls was so cumbersome. Now employees use Hangouts, Google's video chat application.

The countless sessions of excited discussion and occasional yelling matches eventually produced trust and a unified vision.

"The (design) team came up with something that got people excited, and the engineers jumped on that and did amazing things to realize it," Wicks said.

One of those things was a resolution to the curved back dilemma. The Moto X uses a "stepped" battery with an extra top layer, which both helps with fit and provides additional power.

Another Moto X hallmark - its ability to be customized with differently colored back plates and hardware accents - was also a source of both a-ha moments and engineering riddles. Wicks remembers a meeting in Sunnyvale, Calif., where top executives, as they surveyed the many proposed colors and materials spread out before them, asked, "Why do

we have to choose?"

The signoff from the senior leadership team allowed Motorola to offer a much broader array of colors - from a vibrant red to a cool mint green - than other smartphone-makers. Wooden back plates are coming soon.

The customization strategy meant each color and finish had to be tested individually, making sure variations in pigments or materials wouldn't adversely affect the phone's antenna, for example. On the supply chain side, Motorola worked with its manufacturing partner, Singapore-based Flextronics, to retrofit a former Nokia cellphone factory in Fort Worth, Texas, for final assembly so customers would receive their made-to-order devices in fewer than four days.

The thinking was "if we're going to do (customization), we're going to go all the way and have a very great spectrum of color and materials that would benefit everybody's taste," said Andrea Hedl, a member of Wicks' team who led the color palette design for Moto X.

Creating a gadget with natural, humanlike qualities was part of the Moto X's identity from its inception. That vision drove some of the key software features, such as touchless controls and active notifications. Users can train their Moto X to recognize their voice, then use spoken commands to wake up the device, dictate text messages and set reminders. With active notifications, an incoming email or Facebook message prompts a small number of pixels on the screen to light up - saving users the usual ritual of pushing a button to check for these updates.

"The devices you use today are not that smart, actually," Arshad said. "We call them smartphones, but they're really (about) manual operation. We wanted to create something that had more natural human interaction."

Some ideas that didn't make it into the Moto X are being developed for future devices, and the same general team is working on the phone's successor. This continuity is another change from the old Motorola, when the constant churn of products meant employees scrambled from one project to the next.

"At least in my experience, the product was the end," said Nate Connell, the system architecture lead for the Moto X. "We executed a product cycle ... and you started the next product. I don't feel that way anymore, at least not on our team. We have a vision, a technology vision, and there happens to be some products along the way."

Lior Ron, who was a Google product manager before joining Motorola to lead product management for the Moto X, characterized the acquisition as giving the smartphone-maker "a more protected environment where we could really focus and take the long-term view."

Bringing Motorola into the Google fold required a blend of two cultures: a "scrappy, bottom-up ... let's just launch something and iterate" vibe at the parent company and Motorola's "much more planned and rightfully slow" approach to product development. In Ron's view, however, the two companies shared an "engineering-first and technology-first mentality."

"Maybe some of the things on the edge look different, the food or whatever," said Ron, who kept forgetting to bring his wallet to Motorola's cafeteria when he visited the Libertyville office, since Google employees eat for free at the company's legendary canteens. "But at the core ... I think it's a great partnership with companies that have a very similar, very deep identity."