

washingtonpost.com

What Lurks in Its Soul?

By David A. Vise

Sunday, November 13, 2005; B01

The soul of the Google machine is a passion for disruptive innovation.

Powered by brilliant engineers, mathematicians and technological visionaries, Google ferociously pushes the limits of everything it undertakes. The company's DNA emanates from its youthful founders, Sergey Brin and Larry Page, who operate with "a healthy disregard for the impossible," as Page likes to say. Their goal: to organize all of the world's information and make it universally accessible, whatever the consequences.

Google's colorful childlike logo, its whimsical appeal and its lightning-fast search results have made it the darling of information-hungry Internet users. Google has accomplished something rare in the hard-charging, mouse-eat-mouse environment that defines the high-tech world -- it has made itself charming. We like Google. We giggle at the "Google doodles," the playful decorations on its logo that appear on holidays or other special occasions. We eagerly sample the new online toys that Google rolls out every few months.

But these friendly features belie Google's disdain for the status quo and its voracious appetite for aggressively pursuing initiatives to bring about radical change. Google is testing the boundaries in so many ways, and so purposefully, it's likely to wind up at the center of a variety of legal battles with landmark significance.

Consider the wide-ranging implications of the activities now underway at the Googleplex, the company's campuslike headquarters in California's Silicon Valley. Google is compiling a genetic and biological database using the vast power of its search engines; scanning millions of books without traditional regard for copyright laws; tracing online searches to individual Internet users and storing them indefinitely; demanding cell phone numbers in exchange for free e-mail accounts (known as Gmail) as it begins to build the first global cell

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phone directory; saving Gmails forever on its own servers, making them a tempting target for law enforcement abuse; inserting ads for the first time in e-mails; making hundreds of thousands of cheap personal computers to serve as cogs in powerful global networks.

Google has also created a new kind of work environment. It serves three free meals a day to its employees (known as Googlers) so that they can remain on-site and spend more time working. It provides them with free on-site medical and dental care and haircuts, as well as washers and dryers. It charters buses with wireless Web access between San Francisco and Silicon Valley so that employees can toil en route to the office. To encourage innovation, it gives employees one day a week -- known as 20 percent time -- to work on anything that interests them.

To eliminate the distinction between work and play -- and keep the Googlers happily at the Googleplex -- they have volleyball, foosball, puzzles, games, rollerblading, colorful kitchens stocked with free drinks and snacks, bowls of M&Ms, lava lamps, vibrating massage chairs and a culture encouraging Googlers to bring their dogs to work. (No cats allowed.) The perks also include an on-site masseuse, and extravagant touch-pad-controlled toilets with six levels of heat for the seat and automated washing, drying and flushing without the need for toilet paper.

Meanwhile, the Googlers spend countless hours tweaking Google's hardware and software to reliably deliver search results in a fraction of a second. Few Google users realize, however, that every search ends up as a part of Google's huge database, where the company collects data on you, based on the searches you conduct and the Web sites you visit through Google. The company maintains that it does this to serve you better, and deliver ads and search results more closely targeted to your interests. But the fact remains: Google knows a lot more about you than you know about Google.

If these were the actions of some obscure company, maybe none of this would matter much. But these are the practices of an enterprise whose search engine is so ubiquitous it has become synonymous with the Internet itself for millions of computer users. And if the Google Guys have their way, their presence will only grow. Brin and Page see Google (its motto: "Don't Be Evil") as a populist force for good that empowers individuals to find information fast about anything and everything.

Part of Google's success has to do with the network of more than 100,000 cheap personal computers it has built and deployed in its own data centers around the world. Google constantly adds new computers to its network, making it a prolific PC assembler and manufacturer in its own right. "We are like Dell," quipped Peter Norvig, Google's chief of search quality.

The highly specialized world of technology breaks down these days into companies that do either hardware or software. Google's tech wizards have figured out how to do both well. "They run the largest computer system in the world," said John Hennessy, a member of Google's board of directors, a computer scientist and president of Stanford University. "I don't think there is even anything close."

Google doesn't need all that computer power to help us search for the best Italian restaurant in Northern Virginia. It has grander plans. The company is quietly working with maverick biologist Craig Venter and others on groundbreaking genetic and biological research. Google's immense capacity and turbo-charged search technology, it turns out, appears to be an ideal match for the large amount of data contained in the human genome. Venter and others say that the search engine has the ability to deal with so many variables at once that its use could lead to the discovery of new medicines or cures for diseases. Sergey Brin says searching all of the world's information includes examining the genetic makeup of our own bodies, and he foresees a day when each of us will be able to learn more about our own predisposition for various illnesses, allergies and other important biological predictors by comparing our personal genetic code with the human genome, a process known as "Googling Your Genes."

"This is the ultimate intersection of technology and health that will empower millions of individuals," Venter said. "Helping people understand their own genetic code and statistical code is something that should be broadly available through a service like Google within a decade."

Brin's partner has nurtured a different ambition. For years, Larry Page dreamed of tearing down the walls of libraries, and eliminating the barriers of geography, by making millions of books searchable by anybody in the world with an Internet connection. After Google began scanning thousands of library books to make them searchable online, book publishers and authors cried foul, filing lawsuits claiming copyright infringement.

Many companies would have reached an amicable settlement. Not Google. Undaunted, Google fired back, saying copyright laws were meant to serve the public interest and didn't apply in the digital realm of search. Google's altruistic tone masked its savvy, hard-nosed business strategy -- more books online means more searches, more ads and more profits. Google recently began displaying some of these books online (print.google.com), and resumed scanning the contents of books from the collections of Harvard, Stanford, the University of Michigan, the New York Public Library and Oxford. But legal experts predict that the company's disruptive innovation will undoubtedly show up on the Supreme Court's docket one day.

From Madison Avenue to Microsoft, Google's rapid-fire innovation and growing power pose a threat of one kind or another. Its ad-driven financial success has propelled its stock market value to \$110 billion, more than the combined value of Disney, Ford, General Motors, Amazon.com and the media companies that own the New York Times, the Wall Street Journal and The Washington Post. Its simplified method of having advertisers sign up online, through a self-service option, threatens ad agencies and media buyers who traditionally have played that role. Its penchant for continuously releasing new products and services in beta, or test form, before they are perfected, has sent Microsoft reeling. Chairman Bill Gates recently warned employees in an internal memo of the challenges posed by such "disruptive" change.

Microsoft also worries that Google is raiding the ranks of its best employees. That was threatening enough when Google operated exclusively in Silicon Valley. But it grew worse when Google opened an outpost in the suburbs of Seattle, just down the road from Microsoft headquarters, and aggressively started poaching. Microsoft finally sued Google for its hiring of Kai-Fu Lee, a senior technologist who once headed Microsoft's Chinese operations. Lee is now recruiting in Asia for Google, despite a court order upholding aspects of a non-compete clause that Lee signed while at Microsoft.

Google's success is neither accidental nor ephemeral. Brin and Page -- the sons of college professors who introduced them to computing when they were toddlers -- met in 1995 at Stanford, where they were both Ph.D candidates in computer science and technology. They became inseparable and set out to do things their own way. Professors laughed at Page when he said one day that he was going to download the Internet so he could improve upon the primitive early search engines.

Seven years ago, Google didn't exist in any form beyond a glimmer in the eyes of Brin and Page. Then in the fall of 1998, they took leaves of absence from Stanford, and moved their hardware into the garage and several rooms of a house in nearby Menlo Park. Armed primarily with the belief that they could build a better search engine, they have created a company unlike any other.

With Brin and Page setting the tone, Google's distinctive DNA makes it an employer of choice for the world's smartest technologists because they feel empowered to change the world. And despite its growing head count of more than 4,000 employees worldwide, Google maintains the pace of innovation in ways contrary to other corporations by continuing to work in small teams of three to five, no matter how big the undertaking. Once Google went public and could no longer lure new engineers with the promise of lucrative stock options, Brin invented large multi-million-dollar stock awards for the small teams that come up with the most innovative ideas.

A good example is Google's latest deal -- a far-reaching, complex partnership with NASA, unlike any agreement between a private firm and the space agency, to share data and resources and employees and identify ways to create new products and conduct searches together in space. Although NASA is a public entity, many of the details of the partnership remain hidden from public view.

Despite all that has been achieved, Google remains in its infancy. Brin likes to compare the firm to a child who has completed first grade. He and Page gaze into a glittering globe in the Googleplex that shows billions of Google searches streaming in from around the world, and notice the areas that are dark. These are the places that have no Internet access.

Quietly, they have been buying up the dark fiber necessary to build GoogleNet, and provide wireless Web access for free to millions or billions of computer userspotentially disruptive to phone and cable companies that now dominate the high-speed Internet field. Their reasoning is straightforward: If more people globally have Internet access, then more people will use Google. The more books and other information that they can translate into any language through an automated, math-based process they are developing now, the more compelling the Google experience will be for everyone, and the more wealth the company will have to invest in their vision.

Supremely confident, the biggest risk that Brin, Page and Google face is that they will be unable to avoid the arrogance that typically accompanies extraordinary success. Amazon.com founder Jeff Bezos jokes that Brin and Page are so sure of themselves, they wouldn't hesitate to argue with a divine presence.

But the fact remains that they are human beings, and inevitably, both they and Google will make mistakes. Unless any of these prove lethal, however, Google -- through its relentless focus on disruptive innovation -- appears likely to wreak havoc on established enterprises and principles for many years to come.

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