THE FUTURE IS OPEN

In 2009, Jonathan Rosenberg, then Google's SVP of Product Management and now an advisor to Google management, wrote a memo outlining why open companies would win the future. Today, however, he finds a world that has outstripped even his wildest expectations.

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Three years ago this December, I sent an email to my fellow Googlers, attempting to pin a clear definition on a term being batted around quite a bit: Open. I was concerned that within our walls it meant different things to different people, and that too many Googlers didn't understand the company's fundamental commitment to the merits of being open. Referring to the two prongs of open technology and open information, I outlined our underlying ethos of transparency. Pursuing open systems, I argued, has led and would continue to lead to two desirable outcomes: Google gets better and so does the world.

It was a plausible argument, and a later post on the Google blog, 'The Meaning of Open,' helped further clarify this sometimes-elusive concept. In the weeks that followed, I received thoughtful emails from a remarkably broad audience – professors and writers appreciative of the look inside Google, business leaders telling me how open affects their business, grad school students surprised that this was the very opposite of the lock-in strategy they were being taught. Cut to three years later. What leaps out at me from that manifesto now is something entirely different: How wrong I was.

It's not that open doesn't improve Google and the world. It's that this has happened far faster than I'd ever imagined. This realization came to me recently in the middle of the most mundane of twenty-first-century routines: I was checking my phone, a Droid Razr Maxx. Staring at the thing, I saw it for its sheer diversity: Two dozen apps – from the *New York Times* to Flipboard, Dialer One to OpenTable, RunKeeper to SlingPlayer – created by a slew of different developers, on a phone built by Motorola. It occurred to me I wasn't looking merely at a mobile device, but the physical embodiment of how an open ecosystem can ripple its way through the world nearly overnight.

To be sure, I always sensed the idea had legs – but I'd failed to anticipate the extent to which it would rewrite the rules across the private and public sectors. There are three technical trends driving this, and they've evolved at an astounding rate. First: The internet is making information freer and more ubiquitous than I'd thought possible; virtually everything that was offline is now online. Second: The vision of mobile's potential truly became a reality, as devices grew much more powerful and faster than expected, facilitating unprecedented global reach and connectivity. Third: Cloud computing has allowed for infinite computing power on demand. And we're far from finished. As I write this, Google Fiber is preparing to roll out a one-gigabit service in Kansas City, signaling that connectivity is about to go through another order of change.

A bit of irony attends the intersection of these technical developments: Novel as they are, their effect has been to bring more and more businesses back to basics. Product quality and scale are now the most important factors in determining business success. Historically, businesses could take advantage of the scarcity of some information, or of connectivity, or of computing power to attract and keep their customers and repel competition.

Today, customers can make far more informed choices thanks to the availability of consumer information. Indeed, they empower each other to do so, via sites like Yelp and a raft of social media. No longer can a company so thoroughly control its customers' environment. As barriers to distribution have fallen – think cheap space for online retailers – consumers increasingly control it themselves. Under this new paradigm, with markets growing ever more competitive, companies have no choice but to focus on product quality and scale. If they don't, someone else will.

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With so much change happening so quickly, open has emerged as a critical business tactic in achieving product excellence and scale. Opening a product to an army of creatives is the surest path to product innovation and diversity, since it allows each contributor to focus on what they do best and encourages input from the widest possible audience.

Chrome and Android, which have taken off since 'The Meaning of Open' first appeared, exemplify this principle. With both, we've maintained one simple goal from the beginning: Make the product as strong as it can be. As we learned time and again, no route would get us there faster or more reliably than open – more hands working on a product will only improve it. Open allows for preto-typing a concept, or testing it in the earliest stages. What's more, open systems tolerate failure better – and attract a more devoted user base. They know the primary motivation of an open system is product excellence; if the company tried to impose some other agenda on it, the developer audience would detect it immediately and revolt. In committing a product to openness, the company surrenders the ability to do anything but make it better for the user.

The results speak for themselves. If you owned a smartphone in 2006, chances are it said 'Blackberry' or 'Nokia' on it. Even just three years ago, Android represented a mere five percent of the market. Today, we've shot up to 51 percent, and odds are good your smartphone was made by Samsung, HTC, Motorola or another Android partner.

Android has even ended up in places we hadn't anticipated, such as TVs, cars, airplanes, and even appliances. (Check out Ouya, a new videogame console built on Android. Without an open ➡

Android, that sort of innovation doesn't happen.) The lesson seems clear now: If you're going to engage in an open system, you're forever committing to compete for your spot as primary innovator.

Open has been no less instrumental with the Chrome browser, which has been built off the open-source Chromium project. Today, Chrome is a full seven times faster than when it launched just four years ago, and new code becomes available for all the world to see as it's developed. Working in the light of day like this makes it harder to have hidden agendas or otherwise fall short; get things wrong and a global audience of developers will spot it instantly.

Making open work as a business tactic may require new organizational proficiencies. Speed is paramount, as is rigorous decision making. An open ecosystem encourages a flood of ideas, and while creating good ideas is easy, choosing among them is hard. So open can give companies a big competitive edge, but only if they are suitably positioned to take advantage of it. The alternative tactic – most notably employed by Apple and our own search teams – is to keep systems more closed, and to exercise complete control. This approach requires its own set of unique organizational skills, beyond just moving fast, since product excellence and innovation must be sourced entirely from within. Both approaches can obviously be successful, but in our experience, when it comes to building global platforms, going open is a more sure-fire path to success.

Fortunately, a growing number of organizations have seen the writing on the wall. In *Wikinomics*, authors Don Tapscott and Anthony D. Williams recount the tale of Goldcorp, a Toronto gold-mining firm that, in the late '90s, appeared to be on the ropes. Facing a contracting market, a host of internal troubles, and what appeared to be a picked-over mine, CEO Rob McEwen did precisely what any business textbook would say not to: He started giving away what little the company had left.

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Specifically, he dumped 400 megabytes of information about Goldcorp's 55,000-acre property on the company website. Rather than jealously guard its last shreds of proprietary information, he offered $575,000 in prize money to anyone who could use their data to, in essence, find their gold. It was a tremendous success. More than 80 percent of the targets identified by the public yielded significant quantities of gold. From that small initial investment, the company has pulled over $3 billion worth of gold from the ground.

Of course, McEwen was merely tuning in to the deep-seated principles of the open-source movement. In the early, woolly days of the internet, an ethos of universality and egalitarianism pervaded. 'Walled gardens, no matter how pleasing, can never compete in diversity, richness, and innovation with the mad, throbbing web market outside their gates,' Tim Berners-Lee, the inventor of the World Wide Web, has written. Google has always thrived on that diversity, richness and innovation. It's what has allowed us to come out with creations like Chrome and Android – and what allowed, for similar reasons, a timeworn extraction industry to stun the world with similar successes.

Dramatic as the Goldcorp story is, it's the tip of the iceberg. Indeed, what began as a geeky concept within tech circles has spread to all corners of business, governance, healthcare, education, and beyond. We at Google see a number of opportunities beyond the tech sector where open could affect improvements both small and large.

EDUCATION

From Stanford to Korea, universities and teachers around the world are beginning to give away high-quality educational content at no cost under an open copyright license. What's more, this content is increasingly available to people in the most remote locations; bandwidth and connectivity have done away with some of society's most abiding barriers to education.

From the end of a long dirt road in Mumbai, a student with a phone can now take the highest levels of coursework at MIT. Just as excitingly, that student can also become a teacher. Thanks to truly democratizing entities like the non-profit Khan Academy, an online repository of over 3,000 video lectures, people around the world can both utilize and contribute to a growing library of resources, from physics lectures to finance tutorials. We already know the extent to which public education transformed society in the twentieth century. The possibilities for open online education seem just as limitless.

GOVERNANCE

Claims to governmental transparency are one thing – moves like the one Canada made recently, with its formal Open Government Declaration, are another. The document recognizes that open is an active state, not a passive one – it's not just that data should be free to citizens whenever possible, but that an active 'culture of engagement' should be the goal of such measures.

As more municipal, state, and federal governments move in this direction, there's reason to believe it'll pay off financially. (After GPS data was made publicly available in the late 1980s, for example, commercial services built on top of it are thought to have contributed $67.6 billion in economic value within the US.) Conversely, one could argue

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that when the Egyptian regime shut down the internet in January 2011, it forced citizens into the streets to get more information, swelling the crowds at Tahrir Square. In that instance, it's possible that reverting to a more closed system hastened the government's demise.

HEALTH CARE

PatientsLikeMe is a social networking health site built atop the US Department of Health Services' open data. Making way for more initiatives like it could provide more patients with ways to share information and learn from others with similar conditions. Researchers, too, could benefit from greater openness in the industry.

Opening up health data would allow for the kinds of large-scale epidemiological studies that lead to substantive breakthroughs – while employing stronger safeguards than ever to ensure total patient privacy. By making its registry of birth defects available to researchers, for instance, California has allowed doctors to home in on a wealth of information about the health impact of environmental factors. And, of course, Google Flu Trends has already demonstrated how connectivity and scale can coalesce to transform what we know about a particular virus, merely by letting information be shared and collated.

SCIENCE

Researchers, institutions, and funding agencies around the world are beginning to realize that greater sharing and collaboration around the results of scientific research can lead to greater speed and efficiency, higher quality research, and a greater overall impact. As European Commissioner Neelie Kroes noted in a recent speech about science and openness policies in Europe, "Researchers, engineers, and small businesses need to access scientific results quickly and easily. If they can't, it's bad for business."

Greater access to scientific research can stimulate innovation in the private sector and help solve the big challenges we face around the world. (Google Fusion Tables is one tool scientists can use to share and collaborate on disparate sets of data.) Meanwhile, 'open' in the scientific context can mean opening research to entirely new participants. After failing for over a decade to solve the structure of a protein-cutting enzyme from an AIDS-like virus, scientists put the challenge to the gaming community. Using the online game Foldit, players solved it in three weeks.

TRANSPORTATION

By opening up public transit data, governments enable entrepreneurs to build applications that run on top of that data, thereby improving the citizen experience; citizens can also use this open data to report infrastructure problems. At Google, we've already seen how this can work. When we set out to organize the world's geographical information, we found that for many places, good maps simply didn't exist. So we created MapMaker, a participatory mapping product that lets anyone create annotations to Google Maps. With that, a league of online citizen cartographers was born, charting in one two-month period over 25,000 kilometers of previously unmapped roads in Pakistan.

The technical trends converging now are poised to alter – indeed, have already begun to alter – realms that were historically closed, secretive, and stagnant. 'The future of government is transparency,' I wrote three years ago. 'The future of commerce is information symmetry. The future of culture is freedom. The future of science and medicine is collaboration. The future of entertainment is participation. Each of these futures depends on an open internet.'

I'd amend that a bit. Given the radical changes we've seen in just those three years, the challenge has shifted. We must aim beyond even an open internet. Institutions in general must continue to embrace this ethos. Getting to these futures was never going to be easy – but I'm pleased to report that we're closer than ever