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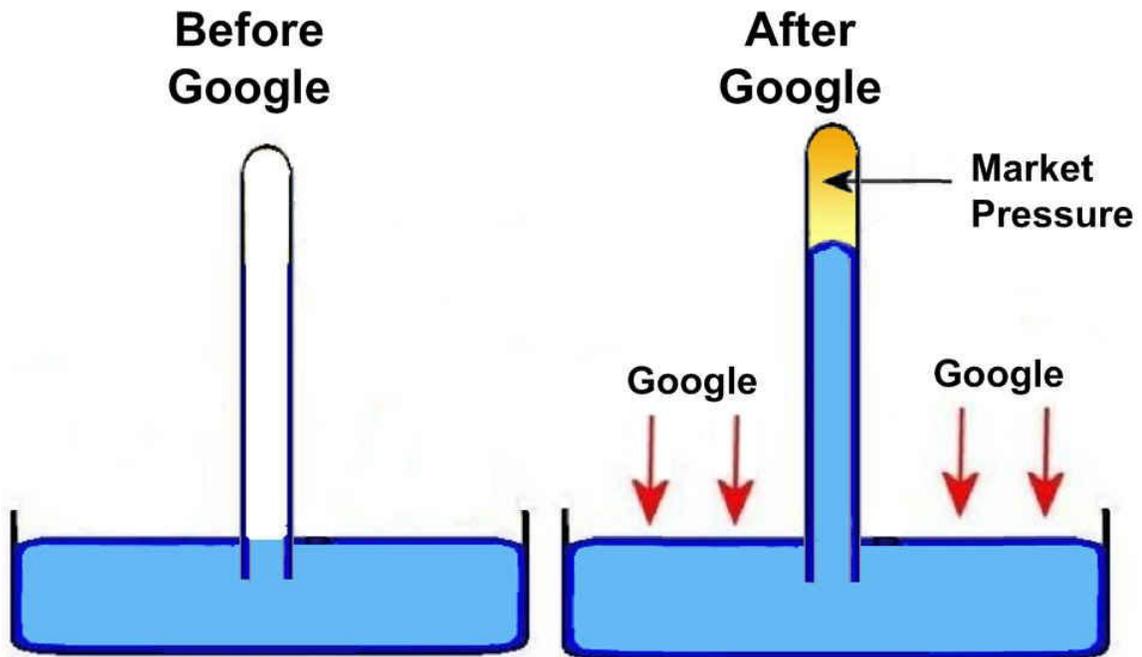
**GOOGLE PHYSICS: GENTLE PRESSURE, BIG FORCE**

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I remember one experiment in high school physics. There was an apparatus into which a basin of water, an inverted test tube, and sensors fit. When the teacher flipped a switch, air was pumped into the chamber. The water was forced up the inverted test tube. Students reported the pressure and temperature. I got my hands on the controls, cranked up the air pressure, and the test tube cracked with a satisfying pop.

True to form the teacher punished me by making me work out the pressure / temperature relationship on the greenboard while my classmates laughed and snorted. What I learned was not the math. What that experiment taught me was a principle of what I am calling Google physics.

Take a look at this diagram.



What this diagram shows is that when puts pressure on the market, the competitive pressure goes up. The more products, services, and innovations that Google pushes into the market, the customers respond which in turn increases the competitive “pressure” in a particular market.

You can see how this works. Google said it would bid on spectrum. AT&T, Verizon, and other telcos found themselves getting pressure. Verizon responded by bidding to get the spectrum and make some effort to provide broader access to it. Then Google nudged Android into the market. At the Google I/O conference, the excitement was palpable. Several attendees told me, “That Android technology is red hot.”

Google rolled out a light weight set of applications for word processing. Then Google added a spreadsheet. Next was a calendar. Now the Google Docs service includes a raft of features that include off line access to these cloud-based, hosted solutions.

You are familiar with Google Maps and Google Earth. Google added a drawing component called SketchUp. Then Google added a self-service market place where three dimensional renderings could be made available to other users. Recently the Walt Disney Company developed a fly through, real life tour of one of its theme parts.

There are many other examples. These range from Google enterprise search hardware called the Google Search Appliance to the Summer of Code programming “contest” for those with a knack for programming.

Taken together, these are the digital equivalent of the compressor that increases pressure in the market place. Google physics makes the pressure go up, sometimes rapidly, in vertical markets. My tally of markets where the “pressure” is rising includes telephony, video, enterprise software, and do-it-yourself advertising. Increase pressure in the broad market; let Google physics force competitors to take action, often without much control or understanding of what’s happening.

Google physics. MBA programs may want to think about adding the course to their required classes list. Come to think of it, a course in Google physics would be useful for law schools too. The failure to understand how Google is taking small steps and producing big reactions needs to be better understood.

Consider this example, which in many ways is trivial. Google worked a deal with NASA to rent the prime real estate occupied by the Federal government. The deal was worth millions and eventually will kick off in 2013 with housing and offices for Googlers. Who really cares about a real estate deal? Well, in the tech-savvy world of Silicon Valley, Google’s simple rental agreement made it explicitly clear that Google was the big dog in Mountain View, California. Google also reminded those with private jets like Oracle’s Larry Ellison that Google can land on the NASA air strip which is within walking distance of Messrs Brin, Page, and Schmidt’s offices. The value of the deal is worth billions, but it cranked up the competitive pressure on egos and companies. In Silicon Valley, the ego factor is often more important than pre-tax earnings.

Google understands physics. One Googler told me that in a meeting to discuss spam (junk email), no one was engaged until another Googler suggested that spam is best analyzed in terms of particle physics. At that point, the meeting took off. Whatever the inspiration, my Gmail account is remarkably free of spam.

Now Google is embracing openness, which is another type of pressure.

Eric Schmidt talked about improvements in search and advertising to *Frankfurter Allgemeine Zeitung*, a leading German newspaper. Sergey Brin talked technology and green computing in Israel. Peter Norvig, Google wizard and one of the world leaders in artificial intelligence, told Anand Rajaraman at Datawocky that humans had to ride herd on certain types of artificial intelligence. The sub text is that Google is really human, not a real life version of HAL in the film *2001*.

Marissa Meyer told a sold out crowd at the Google I/O conference in San Francisco that simplicity and testing are important to Google’s success. She then took a group of female pals to the premier of *Sex and the City*.

Jeffrey Dean, a Google Jedi, provided pictures of the insides of a super secret Google data center.

These are examples of Google physics. The new openness is one more way Google is increasing

its competitive pressure across a number of markets.

The product announcements in April and May 2008 would leave most companies' engineers looking like ultra marathon competitors on a hot day. For example, Google moved the Google Earth service into the browser instead of asking a user to download software. Now Google Earth with its undersea mapping, city-scape imagery, and game-like animation functions is just there—in the browser. There have been enhancements to Gmail received a jolt of steroids with more than a dozen enhancements. Google made it possible to jazz up the graphics on its very important “ig”, individualized Google, service. There were more changes, including the addition of a method to put ads into your syndicated feeds via AdSense.

The obvious question to ask is, “What’s going on?” When I asked several Googlers this question, I was ignored. One Googler did speak with me. After one of my presentations, the Googler stated, “You Photoshopped that Google image.” Alas and alack. We sent the bright but misinformed Googler the bibliographic information for the source of the image. After that, Google returned to its standard operating procedure; that is, ignoring me.

Let me share with you what I think these pressure waves of publicity, product announcements, API goodness, and overall humanization of the company mean.

First, Google saves up goodies and blasts them out without much preamble. I noted a similar swell in news, products, and services right before the IPO in 2004. You may recall these innovations included enhanced advertising, the Google Search Appliance, and Gmail. It’s been four years since Google broke new ground with one gigabyte of free storage and pushed the concept of labels (tags) over Microsoft-style hierarchical folders.

I spotted another pressure wave in 2006. You may remember the world before Google Earth. Companies like ESRI and Boeing were the giants in geospatial services. Now it’s a Google market. Google even has its own Google developed standard, KML, which you can read about at <http://code.google.com/apis/kml/documentation/>.

I think mid-2008 announcements are a clear signal that is turning up the competitive pressure.

Second, Google is getting better at responding to market opportunities. Consider Amazon’s fleet of Web services for cloud computing. Google unveiled its cloud-computing initiative with more arguably a more robust database functionality, 500 gigabytes of free storage, and prices that puts pressure on Amazon’s competitive cloud services business. Estimates for Google technical spending in 2008 are in the \$3.2 billion range. Amazon spends about one-fifth of that amount. I anticipate more cloud-centric announcements from Google in the near future.

Third, Google has the technical infrastructure needed to deliver sub-six millisecond response for most of its services. I’ve noticed that Google doesn’t push the technical peanut ahead an inch at a time. Google prefers to pick up its peanuts and pitch them forward a yard at a time. Google’s 32 plus data centers and their hundreds of thousands of servers allow Google to move more quickly than in the past. The striking different about Google’s squeezing is that it is now exerting an impact on multiple markets, not just search and advertising.

Think about the mobile market sector for a moment. Google’s not in the telephone business per se. Google’s in the infrastructure business, so devices, products, and services only need to connect to the Google cloud. At Google I/O, Google demonstrated applications running on the still immature and evolving Android platform that looked like an Apple iPhone. The demonstrations included a handheld GPS navigation function combined with an all-purpose information access platform

for data, documents, audio, and video. An Android device can allow the phone user to see a mash up or combination of data from different applications within an organization. Custom code is needed to hook the Android- device into an organization via the OneBox API. Google has tossed its Android peanut into the intersection of mobile telephony and enterprise applications.

What is useful to remember is that ad and search are two applications that run on Google's plumbing. The infrastructure can support other applications at low incremental cost. Lower operating costs for new innovations makes Google a tough competitor. If you want to compete with Google you have to do it better than Google does and more economically. For a Verizon or a Microsoft that's a challenge. Verizon is feeling the pressure and bought mobile phone operator Alltel to boost its user base. Google just demoed software and garnered cheers and applause.

I don't think the April-May pressure waves are public relations play. The bursts and squeezes are part of the rhythm of innovation at Google, and I think the intervals between pressure waves is decreasing. This means one thing—competitive pressure is going to rise in a number of markets, not just Web search and advertising.

Some industries—publishing, motion picture, music, and television—need to think a bit more about the GOOG. Reacting to Google without context increases risk. As I write this, many businesses don't see Google as a likely competitor.

I fall back on my mental image from 1959. Without warning, the inverted glass tube shattered. Though unseen, pressure altered the environment in the inverted glass tube. Then the tube broke. Google physics applies to a number of markets.