Google[1]: How can creativity be managed?

Ten miles north of San Jose International Airport, there is a city called “Mountain View”, just 15 minutes’ drive along Interstate 101 towards San Francisco. After driving down the exit ramp, I turned right into a local road and kept driving. Under a glorious blue sky, I drove through a spacious parkland covered with lush grass and clusters of trees and a quiet residential area featuring rows of one-story detached houses. However, this landscape was soon replaced by rough-looking exposed soil characteristic of a newly-developed area. Shortly after entering this section of the development area, the vast campus of the headquarters of Google Inc. came into view on my right.

Formerly the headquarters of Silicon Graphics Inc (SGI), the whole site complete with the buildings has been taken over by Google. Walking through the campus with those thoughts in my mind, I was reminded of how times had changed. Reminiscent of a university campus, I saw a lot of young people (of course Google employees) riding bicycles and groups of people engaged in discussion as they walked with a drink bottle in one hand. In the middle of the campus, there were beach volleyball courts, where a game was under way. Vaguely thinking that co-founder Sergey Brin might be among those people as I had heard that he often played volleyball here, I headed towards the receptionist’s desk of the building I was visiting. I thought to myself, “So this is the famous Google headquarters, a magnet for all those exceptionally talented job seekers from all over the world.

What is Google?

“Google is an Internet search engine developed by Google Inc., a company co-founded in 1998 by Larry Page and Sergey Brin, who were Ph.D. students at Stanford University at the time. Over the years, the company has developed and enhanced various products, such as efficient Internet search techniques and tools, including Google Toolbar, an Internet search tool which lets the user perform a

[1] This case has been compiled by Prof. Masahiro Okada, an associate professor at Keio Business School, based on interviews conducted in August 2005 at the headquarters of Google Inc. (1600 Amphitheatre Parkway, Mountain View, CA 94043) and Google Japan Inc. (F6, Cerulean Tower, 26-1, Sakuragaoka-cho, Shibuya-ku, Tokyo, 150-8512), as well as published data. It is a teaching material prepared to facilitate class discussion through the use of the case method, and as such is not meant to comment on the quality of management in any way (first draft January 2006). The case has been published by Keio Business School (1-1, Hiyoshi Honcho 2-chome, Kohoku-ku, Yokohama City, Kanagawa Pref. 223-8523, telephone 045-564-2444, e-mil case@kbs.keio.ac.jp), and all inquiries regarding the reproduction or any other use thereof shall be directed thereto. The reproduction of this report or any part thereof is prohibited, along with its incorporation into a search system, its use in a spreadsheet and its transmission (electronically, mechanically, via photocopying, sound recording, video recording or in any other form or shape).

search while viewing a web page. As mentioned above, Google Inc. is currently based in Mountain View, California. In 2002, Google became the most popular search engine in the world, and has since built up the largest share of Internet search traffic in the world through its own websites and the websites of its clients, such as AOL. (In Japan, its share is second after Yahoo!) On August 19, 2004, Google Inc. went ahead with an IPO." (Source: Wikipedia, the free encyclopedia; see the article titled "Google".)

Google's Search Method and Information System Used

"Google uses an algorithm called "PageRank" to rank web pages that match a given search term. The PageRank algorithm recursively computes the value index scores of web pages on the basis of the weighted sum of the PageRank values of the pages linked to them. PageRank has thus been derived from human-generated links, and correlates well with the human concept of importance. In addition to PageRank, Google uses other secret criteria to determine the rankings of pages appearing on a results list. Those criteria, thought to number around a hundred, and PageRank have more or less eliminated sites set up for SEO spamming from search results, paving the way for the subsequent Google dominance of the search engine market.

The simplest way to check page ranking is to install the Google Toolbar, available for Internet Explorer, Mozilla's Firefox and other browsers, and use its PageRank feature, which displays the ranking of the visited page in 11 steps using a whole number between 0 and 10. Internationally, the top ranked web page is the home page of Apple Computer Inc. (scoring 10), and the Japanese equivalent (as of September 2005) is the home page of Keio University (also scoring 10), which collaborates with Google in a large scale library digitization project. Previously, the top-ranked Japanese web page was the home page of Yahoo! with a score of 8." (Source: Wikipedia, the free encyclopedia; see the "search method and system used" section of the article titled "Google".)

Information System Used by Google

"To meet the vast search demand, Google performs WWW indexing using more than 10,000 GNU/Linux computers. (More specifically, to maximize the cost performance, Red Hat Linux is used with customization.) For WWW indexing, a crawler called the "Googlebot" is used. Crawlers discover new pages to be added to the database by investigating links to various pages. Already indexed pages are also regularly monitored to check for updates. The combined size of this index database and web page cache is as large as several terabytes.

Initially, both crawlers and web server software were written in the program language Python. However, the main parts of the search engine are now written in C++, while web servers use specialized software called "GWS". Google uses very cheap computers (commodity-class or below) for their servers, and has introduced thorough redundancy to maximize reliability. Moreover, partly to make up for frequent server failures, Google replaces/adds dozens of machines everyday." (Source: Wikipedia, a free Internet-based encyclopedia; see the "search method and system used" section of the article titled "Google".)

Mr. C, Project Manager, International Business Division

When I got to the receptionist's desk, I saw a large screen over my head a little to the left. Looking a bit like a waterfall, it was displaying numerous search words being typed in each moment in various languages across the world.

Shortly after I announced my arrival to the receptionist, Mr. C appeared and welcomed me with a big friendly smile, complete with Japanese greetings. Though a native English speaker, Mr. C was fluent in Japanese and Chinese, and appeared to be in his late 20s. Speaking in very fast Japanese, he showed me around the building. He gave me the impression of being very quick witted as well.

"Look at this screen (a gigantic LCD monitor perhaps as large as 100 inches, which was showing an illuminated world map with colorful 'fountains' gushing out of large cities). It indicates how many queries (search terms) are being input in which parts of the world — in real time." It was colorful and beautiful, and probably had a decorative function as well.

Offices set up in the building were partitioned with glass walls, and were therefore see-through. Each was large enough to just hold four to five PC desks, and as many workers were busily working in such a cramped space. "This is one of our projects. As you can see, it is a little crowded around here because the number of employees has been growing rapidly relative to the capacity of the building." Drink vending machines and other amenities were everywhere. "We have made sure that every engineer has a vending machine and small kitchen within 100 ft (about 30 m). Please take a drink you'd like. They are free." I was led into a meeting room holding about 10 people, and the interview began.

Google is estimated to have about 5000 employees (as of the end of 2005), and its market capitalization (10 trillion yen) is larger than the market values of major Japanese electrical goods manufacturers combined. The source of this strength is the company's ability to develop and provide free of charge various innovative services, including a search service that boasts a No. 1 worldwide market share. It earns revenue from the sale of advertisements targeted at the visitors of its sites. (See Appendix 2 "List of Services Provided by Google".)

Information Sharing Inside Company

One of the notable aspects of the internal workings of Google as glimpsed through employees' blogs is a high level of information sharing.

"Among engineers, all information regarding products and development projects is fully open. Even those still under development can be accessed as long as feedback is provided … The level of information disclosure among engineers at Google must be the highest in Silicon Valley. The code library is fully open to all engineers. Even so, it is virtually impossible to manipulate codes without using terminals set up at the company. Of course, there is a technique to remotely access codes from

home, but the speed of the communications channel is too slow to work efficiently. At the end of the day, most employees prefer to come to the campus for its superior development environment."

(Case writer: Does it mean that there is no information that is off-limits to employees?)

"Of course there are access restrictions. This is because one of the preconditions for the IPO in August 2004 was to stipulate a compliance system. Since the Enron case, this has been required by the Sarbanes-Oxley Act, which is corporate reform legislation. At our company, access restrictions apply on a function by function basis — i.e. prerelease financial data available to number crunchers in the financial division only, sales figures for each advertiser available to the advertising and marketing division only, and so on — rather than on a hierarchical basis."

"I think nothing symbolizes the openness of information at our company more than the TGIF meeting, a company tradition since its founding. It is held from 4.30 p.m. every Friday in a hall holding about 1000 people with the participation of all full-time employees (contract employees and others not eligible). The nature of the meeting is 'Happy Hour' + 'Business Meeting'. Things discussed include main projects currently under development and an overview of the products launched that week, together with the names of the developers and words of praise. Q&A at the meeting proceed on an anybody-can-ask-anything and nothing-is-taboo basis. Topics range widely from the trivial, such as the vending machine at such and such a location is broken, to the serious, such as the veracity of a recent newspaper article regarding the progress of tie-up negotiations with company A and its objectives."

Mechanisms to Share Stock-Type Information

"Typical media that allow all engineers to share information on the intranet they all access are as follows:

1) Weekly Report (Each employee describes what he did in the last week in a few lines. A project manager uses weekly reports as a management tool for the project he supervises as they let him keep track of what the project members are up to.)
2) Google Resume (Entry is mandatory for all employees. The required information includes what the person was doing before joining Google and has been doing after it, as well as his specialized technical area. Resumes are searchable using the name of a degree, technical area, skills, etc. as queries.
3) Quarterly Report (Project based. The required information includes what the goals of the project and individual members are and what was done in the last quarter.) There is also a project database which compiles information on all the projects.
4) Design Document (A project-by-project product design document accessible to all engineers. Design documents are said to closely reflect engineers' abilities.)
5) The database showing the 80-20 (to be discussed later) breakdowns of all individuals."

Tools for Exchange of Flow-Type Information (Daily Information Exchange Tools Used within Projects)

"Regarding information sharing within a project team, a design document, meeting notes, etc. are available for development purposes. Other tools, such as a mail group, a web development tool called SparrowWeb, Blogger and wiki pages, are also used according to team members' preferences and ease-of-use."

Measures to Manage Risk of Information Leakage

(Case writer: How to do you deal with the risk of information leakage from the company, given the extensive internal information sharing being practiced within the organization?)

"Information sharing and information leakage are like chalk and cheese. So before talking about those things, let me explain the issue of user privacy violation. Lately, the launch of our Gmail service (see Appendix 2), etc. have made user privacy protection a hot topic of discussion, but privacy concerns boil down to a trade-off issue between Google and users. That is, users can receive great services from Google in exchange for an appropriate level of personal information disclosure. A similar trade-off relationship exists between Google and engineers regarding information sharing. Engineers are guaranteed unlimited access to information within the company in exchange for keeping it secret from everyone outside the company, including friends and family. This is a rule deeply rooted in the company's organizational culture. Along these lines, engineers are frequently reminded of their obligation not to speak to anyone, not even family members, about things they have become privy to through their work."

Benefits of Information Disclosure

"One of the most obvious benefits is an improvement in the quality of decision-making by individual engineers. That is, since decision-making is entrusted to individual engineers, each one of them must act like 'the President', or nothing happens. Although it is difficult to translate into Japanese, being 'scrappy and entrepreneurial' is part of Google's corporate culture."

Work Environment

"After all, this is an engineer's paradise. The company is accessible 24 hours a day. You can come and go whenever you like. It's like a university campus. The company is also making a great effort to provide excellent amenities. For example, every engineer has a kitchen (drinks and food) within 100 ft of his office. Services such as a massage (not free but cheap), car oil change and car washing are available, as well as washing machines (free), spas, swimming pools and volleyball courts."

Joy and Rewarding Experience of Working at Google

(Case writer: How much do financial rewards weigh on employees' minds?)

"Just the notion of working for Google gives us a great sense of satisfaction and pride. That probably explains why so many employees walk around in a Google T shirt. (Laughter) When we wear those T shirts on vacation or a business trip, people often approach us all over the world. 'Oh, you work for Google? The XYZ service is fantastic!' Happiness stems from the fact that customers love our products. In that sense, Google has adhered to a customer first policy ever since its founding."

"Because we work for Google, we can be the first to provide more services to hundreds of millions of people throughout the world. It is always an option to quit Google and set up a small venture, but becoming independent means you'll have to worry about making a daily living. So it'll be difficult to concentrate on your goal. You can do that here at Google. I think that's why everybody wants to stay."

"As a mechanism to praise and promote intra-company entrepreneurship, the Founders Award has been introduced as was recently reported by the New York Times. The award targets teams that have successfully developed an outstanding service, business or function. It is never given to individuals. As well as newly developed products, bonuses are also given to the successful development of additional functions to existing products. Those bonuses are paid in company shares. In addition to providing motivation, the program is designed to minimize talent drain by offering engineers with good ideas financial rewards that are more favorable than launching a venture business and cashing in on an IPO."

Recognition as Engineers

"Our company restricts the opportunities for engineers to write academic papers and have them published in the public domain. However, there are various avenues for them to present their work internally. At Google, the greatest recognition comes from the team member presentation of successful projects at TGIF meetings. The process in which business ideas are recognized and take off as projects (to be discussed later) itself also gives engineers recognition. Even so, I'd like to emphasize that there is no desire to rank individual engineers or promote competition among them."

80–20 Rule

As has been explained by its CEO, Eric Schmidt, at events held in Japan, including the Nikkei Global Management Forum, the 80–20 rule is a fundamental rule introduced by Google to specify how engineers should use their working hours. Some R&D-oriented companies, such as 3M, have also introduced the so-called 10% rule. This rule provides that engineers can freely pursue research of their interest for up to 10% of their working hours. It is said to promote the creativity of the R&D division by allowing engineers to openly engage in the kind of research that people would be forced to proceed with "under the table" at other companies.

At first glance, Google's 80–20 rule is similar to such a voluntary free research scheme. However, there is a fundamental difference. Namely, at Google, 20% free research time is compulsory. All engineers must dedicate 20% of their working hours to the creation of ideas and development of less certain, future-oriented new services (or an overhaul of existing services). The remaining 80% is used

for the development of “established products”, which have already been recognized as promising projects.

Process Encompassing Idea Selection, Service Launch and Evaluation

“We have set up something like an idea database (idea ML) based on the participation of all employees on the intranet. Anyone can freely upload their suggestions for the improvement of an existing product or ideas about a new service. Those ideas are positioned as feelers for 20%-time free research.

With this ML, an assessment section is provided to the right of the content description section to accommodate a graded assessment of the idea proposed, ranging from “must be taken up by Google” (highly positive) to “would have a detrimental effect on Google” (highly negative). The system allows everybody to cast a vote. Comments can also be added. Assessment scores are then added up to rank the idea. In this manner, the scrutinizing eyes of many employees creates a Darwinian world of natural selection and the survival of the fittest. The ML keeps engineers up to date with interesting ideas that exist within the company and enables them to share them.”

“But the submission of ideas through the ML alone does not lead to the recognition of engineers. The ML is just an idea screening system, so that recognition only becomes an issue after the idea is executed through problem-solving or product development.

Following the submission of ideas, confident proponents produce a demo and make a round of the relevant engineers. If a certain number of engineers become keen and say ‘That’s interesting’, the 20%-time research stage begins. That is, the launch of a new project team. This is where Google and Microsoft are often compared. At Microsoft, an engineer presents a product planning document to his superior, and a budget is allocated if and when the product plan is formally approved. Until then, the engineer is not allowed to write a single line of code during working hours. At Google, things are just the opposite. An engineer first writes a code and creates a prototype on his own. The idea is then put through a “natural selection” screening process culminating in market tests at the Google Lab, etc., followed by the formal adoption of the idea as a product depending on the outcome.

The system keeps track of how many engineers’ 20% free research time is allocated to each project via a list. By examining this list and talking to engineers, project managers relaunch promising 20%-time projects as formal 80%-time projects. The top 100 projects are announced as ‘Google Top 100’ throughout the company.

“Once a project takes off as a formal 80%-time project and the product takes shape, it is launched at the Google Lab. There are many products which disappeared by failing to ‘graduate’ from the lab. This is also Darwinian, isn’t it? The second step is a beta release. The quality of the product is determined through these steps. Real-time data on how many users are downloading a product by recognizing its value provides the product’s unfolding start-up curve. If the user response is sluggish, the project will be terminated without reaching full launch.”

Performance Evaluation System for Engineers

"Evaluation takes place roughly twice a year as a mid-year evaluation and a full-year final evaluation. In the final evaluation, self-assessment and peer review from colleagues (roughly with equal weight, self-assessment given slightly more weight) are prepared and eventually presented to the project manager (PM), who 'compiles' an assessment from them. As the PM adds his own assessment, the final assessment is fairly well-rounded, I think. A typical self-assessment statement goes like this "I was involved in such and such projects this year. My strengths are such and such and my weaknesses are such and such…

By the way, performance evaluation for a PM is basically evaluation of him by engineers, who base their assessments on things like which manager is useful in obtaining funds when launching a project. Engineers are choosy when it comes to a project manager. (Laughter)"

Other Mechanisms for Sharing Information and Know-how

"Google has established an internal seminar program called 'Tech Talk'. Tech Talks cover diverse topics, ranging from programming techniques to programming tips, troubleshooting guides and country-specific customization methods. They provide a forum for the learning and sharing of purely technical know-how."

Engineering Personnel Allocation Policy Based on Priority Business Areas

"As CEO Eric Schmidt has talked about on various occasions, Google has the so-called 70:20:10 rule. That is, the allocation of engineers should be 70% search technology and advertisement business, 20% related services (toolbar, local search, etc.), and 10% input assistance tools (Google Suggest, etc.). This policy influences the company's project priorities."

Assignment of Work to Engineers

"Google's culture expects each engineer to find out what to do himself. Its underlying value stance is 'only people who are most passionate about the given theme should commit themselves to it'. In practice, work assignments for individual engineers are determined after they discuss their demands and preferences with a PM. Top priority is given to what engineers want to do. It's not like a PM dishing out work to engineers."

Mr. Y, Software Engineer

Next, I met Mr. Y, a Japanese software engineer. After receiving a masters degree in information science from a Japanese national university, Mr. Y worked for two years, and then earned a Ph.D. (networks and distributed systems) at a U.S. west coast university. At that point, he received a job offer from eight companies, including HP's storage division and Google (software engineering), and chose HP. He went on to work for the company for four years, and received a green card at the end of

2004. In the following year, he switched to Google. I asked him how things worked out around the time he made the carrier change.

"Contacts I had built at my previous companies really helped me. In 1998, I took part in an intern program at a leading computer manufacturer, and quite a few of my superiors back from those days are now working for Google. The reason I quit HP was because management was not so effective or efficient. Management's visions and product development policies were frequently sent out to employees, but they became unintelligible as they were passed through a multitude of hierarchical layers. Communication between Compaq's development unit, which used to be DEC's R&D unit, and HP's R&D unit was really really poor. In particular, time zone differences due to geographical displacements got in the way. In short, things didn't move forward smoothly."

Employee Motivation

"It is true that the stock option is a powerful motivator. I would be lying if I said otherwise. However, even people who joined the company before the IPO are mostly still here, and only a few have actually sold their shares and quit. I think the employee turnover rate is low compared to HP. Another advantage is that at Google, engineers enjoy a high degree of freedom.

Compared to HP's basic research lab, research has a direct bearing on the company's performance, and it is exciting. I find it fascinating to work for a company that is the overwhelming market and technology leader in the industry. Despite this, Google has an academic atmosphere as a university-incubated venture business."

"I'm also very happy about the working environment. All three meals are free and delicious. They say Google has hired top chefs. The company provides excellent amenities, so we can do things we like without spending money. Washing machines, massages, volleyball courts, you name it. On the other hand, office space is on the small side. It is probably less than half of HP workers, though this may just be a passing phase. Personnel costs per employee must also be lower than HP."

Engineer Recruitment

"Prospective Google employees face stiff competition. There are two categories for the recruitment of technical employees: A. programmers and B. scientists (statistics, natural language processing, etc.). In the case of A, the recruit job description is broad (level of qualification required: a computer science major with a good grasp of C++ and Java). Most applicants are rejected at the resume stage. If an applicant moves on to the interview stage, he will meet six to seven engineers in a day and will then be accepted depending on the outcome. People are being hired all the time. Feels like a few dozen recruits a week.

Between 2001 and 2002, when Silicon Valley was in recession, Google and VMware (both Stanford University spin-offs) were the only companies which kept hiring people. As a result, the two

companies have come to monopolize the Silicon Valley Ph.D. market in the past four years. This is why Google has a deep reservoir of engineers.

Roughly speaking, half of the engineers here are U.S. citizens and the other half foreigners. I think that by proportion, there are more non-U.S. citizens at Google than in Silicon Valley as a whole. Most of the foreigners are Indians, Chinese and Koreans."

Role of Project Manager

"Some of the managers are former engineers. Their main duties include making arrangements for financial resources. There are young managers as well."

Work Assignment

"'You find your own work' is the principle that applies here. When I was just recruited, it was like 'just take a look around and find out what people are doing'. In my case, my contacts proved very useful. The contacts from my previous companies, as mentioned before, really helped me out."

Ranking of Engineers

"The majority of employees are engineers. There is a ranking scheme for engineers based on their skills. The lowest level is software engineer, and I am here. Regardless of the academic qualifications at the time of recruitment, everybody starts at the bottom."

"The interesting thing is someone's ranking and remuneration are not directly linked. Within the same rank, remuneration varies from person to person."

Difference between Google and Open Source Movement

"As Google is a private enterprise, it must seek profits. Despite this, the beginning of a project is not so dissimilar to the open source movement. It goes like this: under the 80–20 rule, as soon as a new idea is born, it is circulated among other engineers for comments, and if a sufficient number of them take an interest, a team is formed to pursue it further; and if the idea looks promising, it takes off as a full-fledged project, with a manager appointed and a budget allocated."

Mr. D, Staff Engineer

The case writer then met Mr. D, a staff engineer who was an Indian American. Looking somewhat older and more mature among Google employees, Mr. D was a Stanford graduate who joined Google after working for Sun's laboratory, WebGain and VMware. He called himself a 'software engineering generalist'. At Google, he writes ad-related programs. He is an engineer and a project manager.

(Case writer: Is it fair to say that Google engineers embrace hacker ethics?)

“Absolutely yes.”

Ranking of Engineers

“Although several ranks exist among engineers, it is preferable to keep their job titles the same as far as practicable. The intention behind putting together more than 2000 engineers under the modest title of “Software Engineer” is to create an environment where employees actively engage in discussions as equals regardless of ranking and are assessed only on the basis of their abilities. Individual engineers’ ranks are for personnel management purposes only. Someone’s rank is known only to the engineer himself, the personnel department and the manager. His colleagues haven’t got a clue.”

Power of Engineers

“At traditional high-tech companies, managers have power. Engineers must obey their orders. In contrast, Google’s project managers are more like facilitators of development projects, rather than leaders. In a project, the PM serves as the lubricant that facilitates it by mediating between engineers and other sections.
Namely, at Google, engineers have power. Unrestricted communication is guaranteed, and engineers can put into practice what they believe is right.”

(Case writer: At Google, certain outlets for engineers’ talent, such as the publication of academic papers, are closed, aren’t they?)

“That’s true, but people wanting to make their names by having their papers published in academic journals would not consider coming here in the first place. The internal equivalents of papers are designed documents, and they are what engineers are rated on. In that sense, Sun’s laboratory where I used to work was more open to the outside world. Lots of researchers published their papers.”

“On the other hand, Sun’s laboratory had a striking similarity to Google. That is, engineers remained involved until the release of final products. At other major high-tech companies, the development arm and the marketing arm are usually separate, but Sun had their engineers involved till the end, and that was great.”

Evaluation by Colleagues

“Google’s evaluation system is based on a self-assessment by an engineer and peer evaluation by fellow engineers, which are passed on to the PM to make a final decision. Although the self-assessment carries greater weight, all engineers consider peer evaluation very important. This is because they don’t want to be evaluated by managers, who only have a superficial understanding of their work. They much prefer to be evaluated by their fellow engineers, who truly understand what

they do. Peer evaluation is easy to live with. In other words, what is important for Google engineers is 'how I can please my peers' and 'how I can help them'."

"At Google, the type of engineer who locks himself up in his room and does programming all day without any contact with colleagues is not rated highly. Interaction with fellow engineers is very important. As new projects are developed through an organic process, it is impossible to launch successful projects without interaction with fellow engineers. The project group is an important organizational unit."

"So far, it's paid off."

Organizational Culture

"To put it simply, Google's organizational culture is very much like a university or research lab. In addition, high trust exists among engineers. Engineers are highly independent, and there is an air of mutual respect.

Another notable point is that Google does not have product-specific business divisions. Instead, each engineer is very much self-employed, and tries to come up with a project using his skills and ideas. In this kind of environment, engineers must prove what they can using their talents.

Google's organizational values can be summarized in four points: 1) Openness and high trust, 2) Flat organization, 3) Empowerment of engineers, and 4) 20% logic."

Appendix 1: Company Overview (from Google Home Page)

Company Overview

Google's mission is to organize the world's information and make it universally accessible and useful using its unique search engine.

As a first step to fulfilling that mission, Google's founders Larry Page and Sergey Brin developed a new approach to online search that took root in a Stanford University dorm room and quickly spread to information seekers around the globe. Google is now widely recognized as the world's largest search engine — an easy-to-use free service that usually returns relevant results in a fraction of a second.

When you visit www.google.com or one of the dozens of other Google domains, you'll be able to find information in many different languages; check news headlines; search billions of images; and peruse the world's largest archive of Usenet messages — more than 1 billion posts dating back to 1981.

We also provide ways to access all this information without making a special trip to the Google homepage. The Google Toolbar enables you to conduct a Google search from anywhere on the web. And for those times when you're away from your PC altogether, Google can be used from a number of wireless platforms including WAP and i-mode phones.

Google's utility and ease of use have made it one of the world's best known brands almost entirely through word of mouth from satisfied users. As a business, Google generates revenue by providing advertisers with the opportunity to deliver measurable, cost-effective online advertising that is relevant to the information displayed on any given page. This makes the advertising useful to you as well as to the advertiser placing it. We believe you should know when someone has paid to put a message in front of you, so we always distinguish ads from the search results or other content on a page. We don't sell placement in the search results themselves, or allow people to pay for a higher ranking there.

Thousands of advertisers use our Google AdWords program to promote their products and services on the web with targeted advertising, and we believe AdWords is the largest program of its kind. In addition, thousands of web site managers take advantage of our Google AdSense program to deliver ads relevant to the content on their sites, improving their ability to generate revenue and enhancing the experience for their users.

Google by Numbers:

Searchable web pages: Not released
Images: Billions
Usenet messages: More than 1 billion
Interface languages: More than 100
Search results display languages: 35
Domains set up across world: More than 100

Employees: More than 7000 throughout world

Executive Management Group:

Dr. Eric Schmidt, Chairman of the Executive Committee and Chief Executive Officer
Larry Page, Co-Founder & President, Products
Sergey Brin, Co-Founder & President, Technology
George Reyes, Chief Financial Officer
Omid Kordestani, Senior Vice President, Global Sales & Business Development
Alan Eustace, Vice President, Engineering
Jeff Huber, Vice President, Engineering
W. M. Coughran, Jr., Vice President, Engineering
Jonathan Rosenberg, Vice President, Product Management
David C. Drummond, Vice President, Corporate Development
Shona Brown, Vice President, Business Operations
Tim Armstrong, Vice President, Advertising Sales
Salar Kamangar, Vice President, Product Management
Sheryl Sandberg, Vice President, Global Online Sales & Operations
Sukhinder Singh, Vice President, Asia-Pacific & Latin America Operations
Nikesh Arora, Vice President, European Operations
Norio Murakami, President, Google Japan Inc.
Vinton G. Cerf, Vice President & Chief Internet Evangelist

Board of Directors:

Dr. Eric Schmidt, Google Inc.
Sergey Brin, Google Inc.
Larry Page, Google Inc.
John Doerr, Kleiner Perkins Caufield & Byers
Michael Moritz, Sequoia Capital
Ram Shriram, Sherpalo
John Hennessy, Stanford University
Arthur Levinson, Genentech
Paul Otellini, Intel
Shirley M. Tilghman, Princeton University

Appendix 2: List of Services Provided by Google (As of December 2005)

Apart from the usual search service, Google provide the following services:

1. Google Image Search

Google Image Search allows users to search the Web for image content by entering text attached to the image, text adjacent to the image, etc. as keywords. To protect children from pornographic images and other unsuitable images, a filter feature has been made available.

2. Google News

Google News was formally launched in September 2002, initially in English only, with the Japanese language version following in September 2004. The service distributes latest news headlines based on articles from newspaper publishers and other news sites. Headlines are links, and clicking them takes you to the respective source news sites. Despite the use of headlines and brief quotes, there are no contractual arrangements between Google and source news sites. The Google News home page can be customized to adjust the arrangement of news headlines by category and add a customized section based on keywords. Other features include Google News Alerts, which automatically e-mail subscribers news headlines that match keywords specified by them. As of December 2005, Google News is still in Beta in all languages.

Around April 2004, an individual distributed news stories sourced from the U.S. version of Google News via RSS feed, and this prompted Google to serve a complaint to the individual concerned. Despite the controversy, Google formally began distributing the English version of Google News via RSS/Atom feed on August 10, 2005 in consideration of user demand.

3. Google Groups

Google Groups is a search feature for news groups. The service was initially acquired from Deja.com. Users can search for and view all Usenet archival data up to the time of acquisition and all data posted since.

4. Google Directory

A directory service provided by Google. It was originally developed under the Open Directory Project and subsequently added to Google's services. Search results consist of links to sites and site descriptions.

5. Calculator Feature

In addition to Web search, the Google Search service incorporates a calculator feature to enable users to perform arithmetic calculations. For example, entering "1+1" in the search box returns the number "2". It is capable of advanced calculations, such as i^i, as well as unit conversion. It even returns the "correct answer" (42) to the fictional question "answer to life, the universe and everything". However, the question "7-11" does not get the expected answer (-4). This is because Google interprets it as search text instead of an arithmetic question and comes out with search results relating to 7-Eleven the company. This can be avoided by adding "=" at the end of the question.

6. Gmail

On April 1, 2004, Google announced that it would provide a free webmail service called “Gmail”.

Gmail incorporates various Google technologies developed so far. Although the capacity of the mailbox was initially 1GB, an announcement was made to double it to 2GB in April 2005. The capacity has since grown to well over 2GB, and an ongoing effort appears to be made to increase the capacity further, as can be seen from the storage space counter featured in the English-version log-in screen. At present, the service is still in beta, so that you cannot access it unless you are invited by a Gmail account holder.

Messages can be managed using labels. Although labels are used for the same purpose as folders, one message can be associated with more than one label, something that would not be possible with folders. For example, two labels, “friend” and “photo”, can be attached to a message, and the message can be retrieved via either label.

Messages that are no longer needed can be archived instead of deleted. Archived messages are removed from the Inbox but can be retrieved and displayed via All Mail, when necessary.

One notable aspect is a mail display method called the “Conversation View”, which organizes messages as a conversation (a thread of exchanged messages). When a conversation is opened, exchanged messages are displayed stacked on top of each other, with the latest message sitting at the bottom, open and ready to read. There is also a feature called “Starred”, which facilitates access to selected messages by attaching a star symbol to them. It is also possible to view messages in real time using RSS browsers compatible with the Atom specification.

Another notable aspect is the display of context-sensitive ads that change with the content of the message. (This has raised concerns over intrusion into privacy.)

Regarding non-English interface, Gmail now supports 29 languages, including Japanese, up from 13 on April 5, 2005, despite some inconsistencies from server to server.

7. Google Maps

In 2004, Google launched a map search and display service in the United States and Canada. Google Maps offers a level of functionality comparable to desktop map software installed on a PC. In October 2004, Google acquired a satellite photo viewing software company called Keyhole Inc., and satellite photos of U.S. territory became available in April 2005. (Some sites do not allow enlargement due to the involvement of U.S. Government top secret information, etc.) All photos bear the Google logo. At present, the map search feature is still in the beta stage. In July 2005, Google Maps and Google Local were also launched as beta services in Japan. Google Maps allows users to switch between two views: Map (map information, made accessible through a tie-up with Zenrin Co., Ltd.) and Satellite (satellite photos — high-resolution photos available for large cities, such as Tokyo and Yokohama, only, as well as a small number of selected sites in rural areas, including the neighborhood of the Suzuka Circuit). Google Local lets users search for a destination (locations contained in Yellow Pages only) and shows

the result on a map from Google Maps, marked with a pin. Google Maps is also available for Internet-capable mobile phones, including i-mode.

8. “Did you mean:” Feature

Google detects input errors in the search box and automatically displays an alternative expression under the heading “Did you mean:”. (In the early days, only English word spelling errors were corrected even with the Japanese language service, but both English and Japanese are now covered under the “Did you mean:” feature.) However, the Japanese version of this feature was initially plagued with errors, so much so that it was suspended in November 2004. It was reintroduced in March 2005 with an improved algorithm of Japanese language processing.

9. Blogger

Is a web log service launched by Google through the acquisition of Pyra Networks in February 2003. Although it supports Japanese, blog settings, etc. are displayed in English.

10. Google AdSense

Is Google’s affiliate program for webmasters. It is an enrolment-based service, and anyone can take part if approved after going through a set procedure. Affiliates are paid a portion of Google’s sales proceeds as rewards according to the number of click throughs recorded.

AdSense enables Google to place ads that are relevant to the content of the site by analyzing it with its search engine. These ads are known to be text-based and low-key, free of intrusive images.

Until recently, rewards for Japanese affiliates were paid with US-dollar checks, but this was unpopular because of the high currency conversion fee and complicated procedure. As a result, payment via bank transfer was introduced in Japan in August 2005.

11. Google AdWords

Is Google’s ad placement service for advertisers. Google automatically distributes and displays site-targeted ads in its search results, on websites that have signed up with the Google Adsense program, on portal sites which have formed an alliance with Google, and so on. Advertising fees are determined through auction for each keyword combination included on a per-click-through basis. If the number of click throughs falls below the predetermined level for a certain ad, the display of the ad concerned will be discontinued.

In February 2005, Google was sued by Louis Vuitton over this keyword-based auction method, and was subsequently found guilty for trademark counterfeiting, unfair competition and misleading advertising. For this offense, Google was ordered to pay a fine of 200,000 euros. This case had a major impact on the search engine industry because Google relied heavily on online advertising fees for revenue and its competitor Yahoo! was also earning substantial revenue from online advertising through its subsidiary Overture.

12. Google Sitemaps

Is a service launched in July 2005. It was introduced to catch dynamic web pages which had, until then, been out of reach for Google's search engine. The detection of dynamic pages became possible as webmasters began placing XML files that listed URLs for their respective sites at set locations for the access of search engines.

13. Google Analytics

In November 2005, Google began supplying web analysis software developed by Urchin, a company acquired by Google in March 2005, free of charge despite a normal price tag of $400 per month. The main purpose of the service is to improved the efficiency of AdSense ad placement, but it has also been made available for webmasters who do not use AdSense. Because of the unrestricted release of the software, the level of registration exceeded Google's expectations, resulting in the temporary introduction of registration restrictions.

14. Google Personalized Homepage

Is a service launched on May 19, 2005 (November 4 for the Japanese version). It allows users to set up a personalized home page on which Global News, Gmail, Bookmarks, and various RSS feeds can be arranged as modules to suit individual taste. On December 14, Google Homepage API was released, allowing users to develop their own modules.

<15–19: Native applications supplied by Google (stand-alone programs installed on, and executable from, a PC, PDA or other device). They are mainly targeted for Windows.>

15. Google Toolbar

Is an Internet browser toolbar available for Internet Explorer 5.0 or later and Firefox 1.0 or later. It offers various features, including voting buttons and a keyword highlighting button.

16. Google Desktop

Is desktop search software released in October 2004. Initially, only an English version was available. Installed on individual PCs, it enables PC users to locate local files quickly and without putting too much load on the CPU. Search results are displayed on a browser page. In March 2005, the Japanese version was released in beta, and this was closely followed by the final release two months later. In October 2005, Version 2.0 was released, making it possible to view news headlines, new e-mails, Windows task status, etc. on the Sidebar panel.

17. Google Talk

On August 24, 2005, Google released a beta version of Google Talk, a free instant messaging application. It supports Windows Server 2003 and Windows XP/2000. Although currently only an English version is available, communication in Japanese is possible. To use the service, a Gmail account is required. Since there is a fair risk of personal information leaking out, adequate precaution needs to be taken.

18. Google Earth

Is a free virtual globe program that lets users explore the Earth using maps, satellite photos, etc. from all over the world. Google Earth is similar to NASA World Wind, but there is a major difference in that Google Earth runs on low-spec PCs. Fee-paying versions offer additional features, such as GPS integration, map data export to spreadsheet software, and printing of high-resolution images. Supported operating systems are Windows 2000 and Windows XP (a beta version released on June 28, 2005 and the final version released on January 10, 2006), as well as Mac OS X (a beta version released on January 10, 2006). As of January 2006, all versions are only available in English.

On August 18, 2005, the name label of the Sea of Japan was changed from Sea of Japan (East Sea) to East Sea (Sea of Japan) in response to a protest originating at an electronic bulletin board in South Korea, set off an avalanche of protest from Japan. In the end, the dispute was settled by labeling the Koran-side half of the sea "East Sea" and the Japanese-side half "Sea of Japan". Other problems include the criticism of the service by India and other countries for supplying sensitive information to terrorists by making high-resolution satellite photos of various sites from all over the world, including military facilities and nuclear facilities, widely available.

19. Picasa

Is free digital photograph management software released by Google following the acquisition of Picasa in July 2004. It offers various features, including the adjustment of contrast and brightness of images, image rotation, image search and sorting, and creation of backup copies of images on CDs and DVDs. On September 20, 2005, the Japanese version of Picasa 2 was released (Windows only).
<20–25: Features unique to Japanese version>

20. Corporate Information Search

Enables users to search the Web for corporate information. For example, entering "corporate information Matsushita Electric Industrial Co., Ltd." in Japanese in the search box will return Matsushita Electric's corporate information at the top of the results list. However, the feature may not work properly if the official name of the company is not used.

21. Stock Price Search

Enables users to search the Web for stock prices. For example, entering "stock price Sony" in Japanese in the search box will return Sony's stock price information at the top of the results list.

22. Dictionary Search

Both Japanese-to-English and English-to-Japanese dictionary searches are available. For example, entering "Japanese to English book" in Japanese in the search box will return "Look up the word "book" in a Japanese-to-English dictionary" at the top of the results list. To look up an English word "book", you enter "English to Japanese book" in a mixture of Japanese and English as appropriate.

23. Travel Route Search

Enables users to search the Web for travel routes. For example, when searching for route information for travel from Tokyo to Osaka, you enter "Transfers Tokyo Osaka" or "from Tokyo to Osaka" in

Japanese. The browser will return “Transfer information from Tokyo to Osaka” at the top of the results list.

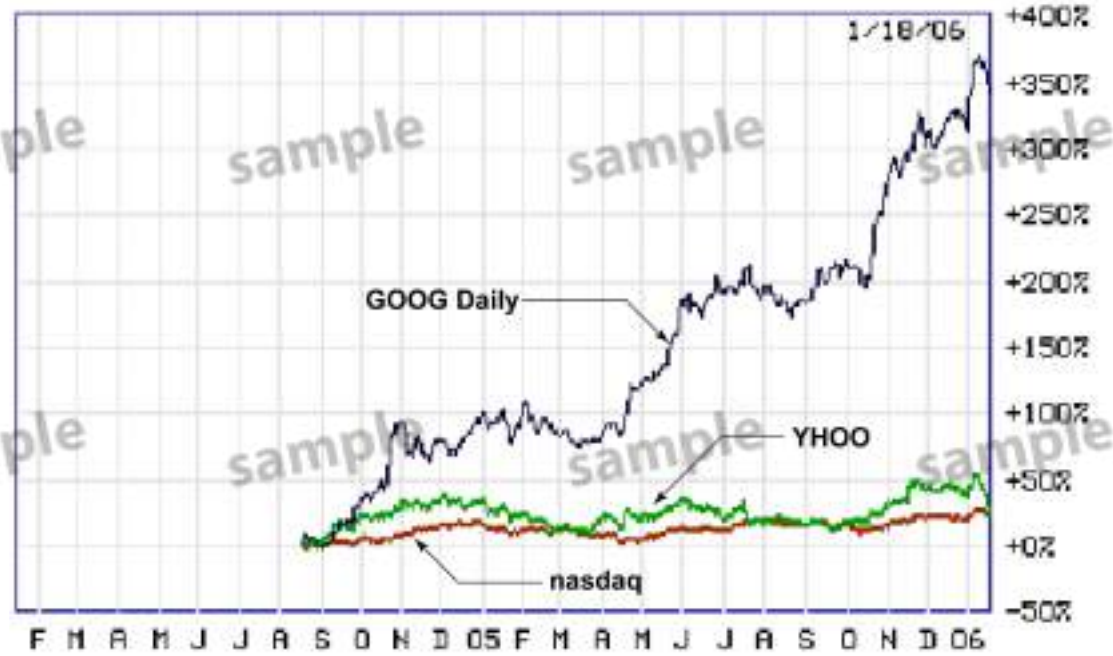
24. Freight Search

Enables users to search the Web for the delivery status of parcels sent through Yamato Transport Co., Ltd.’s courier service. For example, entering “Yamato ##########” in Japanese will return “Delivery status of Yamato Transport docket No. ####_####_####”.

25. Mobile Search

Google also offers a web page search service for mobile phones. In the case of i-mode phones, only DoCoMo’s unofficial home page is available. The service is currently in beta.

Appendix 3: Google Inc.'s Stock Price Trends



Appendix 4: Corporate Data

Google Inc. (GOOG)

Google Inc. offers targeted advertising solutions and global Internet search solutions through its own destination Internet site and intranet solutions via an enterprise search appliance. Its principal products and services include Google.com, Google AdWords, Google AdSense and Google Search Appliance. Google.com comprises products and services that benefit users and enable them to find relevant information quickly and easily. Google AdWords enable advertisers to present advertisements to people at the precise moment those people are looking for information related to what the advertiser has to offer. Google AdSense enables the Websites in the Google Network to serve targeted advertisements from AdWords advertisers. Google Search Appliance is a software and hardware solution that companies can implement to extend Google's search performance to their internal or external information.

Number of Employees	**4,989**	Fiscal Year Ending Date	**12/31/04**
Sales (in millions)	**$3,189.22**	1-Yr. Sales Change	**117.56%**

Stock Data

Market Capitalization (in millions)	**$138,053.50**	Percent Owned by Institutions	**47.63%**
Shares Outstanding (in millions)	**295.55**	Number of Institutional Shareholders	**1,388**
Public Float (in millions)*	**191.6**	Percent Owned by Insiders	**35.17%**
Latest Dividend	**n.a.**	Last Stock Split	**n.a.**
Pay Date of Latest Dividend	**n.a.**	Date of Last Split	**n.a.**
Dividend Yield	**n.a.**	P/E Ratio (without extraordinary items)	**103.54**
		P/E Ratio (with extraordinary items)	**103.54**

*Shares outstanding, minus shares controlled by insiders, restricted stock and shares held by 5% owners.

Appendix 5: Financial Data (Quarterly Income Statement)

QUARTERLY EARNINGS

Google Inc. (GOOG) Class A

Quarter Ended:	3 Months Ending 9/30/05	3 Months Ending 6/30/05	3 Months Ending 3/31/05	3 Months Ending 12/31/04	3 Months Ending 9/30/04
Net Revenues	$1,578,456	$1,384,495	$1,256,516	$1,031,501	$805,887
Total Revenue	1,578,456	1,384,495	1,256,516	1,031,501	805,887
Cost of Revenues	653,826	597,095	545,208	453,779	362,099
Research & Develop.	151,721	95,772	79,412	87,442	57,409
Sales & Marketing	104,996	97,024	82,952	76,107	65,512
General & Admin.	92,434	71,568	57,266	51,843	40,774
Stock-based Compen.	46,308	47,338	48,908	59,531	67,981
Settlement of Disputes with Yahoo	0	—	—	0	201,000
Total Operating Expense	1,049,285	908,797	813,746	728,702	794,775
Operating Income	529,171	475,698	442,770	302,799	11,112
Interest/Other, Net	20,797	19,722	13,686	7,374	3,866
Net Income Before Taxes	549,968	495,420	456,456	310,173	14,978
Provision for Income Taxes	168,786	152,606	87,263	106,073	-37,005
Net Income After Taxes	381,182	342,814	369,193	204,100	51,983
Basic Weighted Average Shares	275,130	270,729	266,106	261,172	205,007
Basic EPS Excluding ExtraOrdinary Items	1.39	1.27	1.39	0.78	0.25
Diluted Weighted Average Shares	289,673	287,238	286,612	285,944	274,735
Diluted EPS Excluding ExtraOrd Items	1.32	1.19	1.29	0.71	0.19

Figures from quarterly income statement. Figures in thousands except per share items. Figures in parentheses are losses.

Appendix 6: Financial Data (Annual Balance Sheet)

Year Ended:	12/31/04	12/31/03	12/31/02
Cash/Equivalents	$426,873	$148,995	$57,752
ST Investments	1,705,424	185,723	88,579
Accounts Rcvbl.	315,798	159,360	64,291
Doubtful Account	−3,962	−4,670	−2,297
Tax Receivables	70,509	0	—
Deferred Taxes	19,463	22,105	12,646
Prepaid/Other	159,360	48,721	10,825
Total Current Assets	2,693,465	560,234	231,796
Info.Tech. Asset	504,127	204,417	78,764
Furniture/Fixt.	11,974	6,803	1,835
Lsehld. Improv.	17,617	7,677	908
Constr. in Prog.	49,350	42,940	5,379
Depreciation	−204,152	−73,582	−33,013
Goodwill	122,818	87,442	0
Intangibles	71,069	18,114	96
Deferred Taxes	11,590	0	—
Prepaid/Other	35,493	17,413	1,127
Total Assets	3,313,351	871,458	286,892
Accounts Payable	32,672	46,175	9,394
Compen./Benefits	82,631	33,522	14,528
Accrued/Other	64,111	26,411	10,810
Accr. Rev. Share	122,544	88,672	13,100
Deferred Revenue	36,508	15,346	11,345
Taxes Payable	0	20,705	25,981
Cur.Port.Leases	1,902	4,621	4,350
Total Current Liabilities	340,368	235,452	89,508
Equipment Leases	0	1,988	6,512
Total Long Term Debt	0	1,988	6,512
Deferred Revenue	7,443	5,014	1,901
Liab. for Option	5,982	6,341	567
Deferred Taxes	0	18,510	580
Other LT Liabs.	30,502	1,512	0
Total Liabilities	384,295	268,817	99,068
Rdml. Pref. War.	0	13,871	13,871
Conv. Preferred	0	44,346	44,346
Class A/B Common	267	161	145
Paid-in Capital	2,582,352	725,219	83,410
Note Receivable	0	−4,300	−4,300
Dfrd. Compensat.	−249,470	−369,668	−35,401
Other Income	5,436	1,660	49
Retained Earning	590,471	191,352	85,704
Total Equity	2,929,056	602,641	187,824
Total Liabilities & Shareholders' Equit	3,313,351	871,458	286,892
S/O-Class A Common Stock	95,543	11,221	—
S/O-Class B Common Stock	178,981	161,633	160,866
Total Common Shares Outstanding	274,523	172,854	160,866
Employees	3,021	1,907	—
Number of Common Shareholders	2,155	—	—

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