Technology and Strategy
A Study of Google

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Dr. Ing. M. A. Zegveld
Dr. E. den Hartigh
Student: Hadi Asghari
Executive Summary

Google, master of online search and a dominant player in the online advertising business, is the focus of this paper. The paper starts with an introduction to Google, and proceeds to analyze a number of issues: value system and value chain, phase of evolution, operational value creation, organization of innovation, knowledge management, and strategic management. From the analysis we aim to understand Google’s strategy, and make some recommendations for the future.

The value chain of Google is rather unique in the sense that it takes as input user traffic (reflecting audience), and converts it into targeted advertising, all of which are intangible. In the process significant added value is created. Both the value system and value chain of Google are in a state of change, the former due to the structure of the Internet industry, and the later due to its growth.

Google can be classified as a company belonging to the networked economy. In other words, the services it offers to both advertisers and users are mass-individualized.

Financially, Google is doing very well. Analyzing its operational value creation, we can see that it has steadily increased differentiation to around 60%, and its revenues have been growing 50% every year. Recently some signs of a slowdown in growth have emerged.

Innovation plays a key role in Google’s culture and success. The company started from a technology-push, and today is using the 4th generation innovation system. It innovates in many aspects and is considered as one of the world’s most innovative companies.

Google’s core competitive competencies are its market position, engineering talent, and data centre infrastructure. It has successfully exploited its competencies and the result is a high and stable level of knowledge productivity for the past five years.

Combining all the strategic aspects together, it becomes evident that Google executes a stable and coherent strategy. It has sustainable differences compared to its competitors. However, it faces two challenges: the dynamism of its value system, and how to diversify its revenue stream.

Our recommendation as a next step for Google is to diversify by entering the mobile market with full force. The mobile ad industry is a lucrative business in itself, and because of its similarities with Google’s current activities, the growth trap is avoided.
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0. Company Profile

Overview
Google is a global technology company with a stated mission of *organizing the world’s information and making it universally accessible and useful*. It was founded by two Stanford graduates in 1998, and became a publicly traded company in August 2004. It maintains the world's largest index of Internet information which it makes freely available. It is also the biggest online advertising destination, generating more than $16 billion revenue from sales of advertisement space in 2007.

Google is the market leader in the Internet and Services industry in which it operates, and holds the title of most valuable global brand.

Core Activities and Markets
Google owns over 58% of the search engine market [1] and enjoys competitive advantage over its rivals due to advanced yet easy to use search technology. It currently indexes billions of web pages, images, videos and other content, and is also experimenting with newer sources of information. Various proprietary technologies enable it to show search results highly relevant to user queries.

Google does not charge for its search services, but rather combines its huge user base with its expertise in analysing search queries and web-pages as the basis of its revenue generating technologies, *AdWords* and *AdSense*. These services allow it to deliver relevant, cost-effective online advertising. With the help of partners and its sales team, these services are monetized to the fullest extent yielding huge profits.

Search and Ads, are Google’s main activities, constituting 70% of development efforts.

Product Portfolio
Google has a diverse portfolio consisting of several dozen services. These services can be grouped in the following categories: *Search, Ads, Apps, and others.*

Search
Web Search was Google's initial product, and during the years it has relentlessly expanded its efforts. The number of web pages in its index has grown enormously, and features such as spell checking, language translation, and spam detection have been added to improve result relevancy.

Inline with its mission of organizing the world's information, Google is expanding its search into other areas, such as video. In this regards, Google acquired *YouTube* for $1.65 billion in 2006. Other content sources include images, news, weblogs, patents, and Google Scholar. An ambitious project has been scanning printed books in order to provide full text searches of their contents.

Advertising
When users search on Google, the result page contains a distinctive set of so called sponsored links. These are paid for ads displayed by the *AdWords* service. Advertisers “bid” for keywords. In response to queries containing those keywords, their ads might be shown - depending on their willingness to pay and quality score.
**AdSense** works in a somewhat different manner. Although the bidding strategy remains the same, the advertisements are delivered through web pages belonging to 3rd party sites. These publishers are compensated for clicks, and can recover some of their investment in creating content of value.

**Applications**
Google has developed certain applications to uphold a loyal user base. These applications facilitate online communication and collaboration. Some examples include *Gmail, Calendar, Documents, Blogger, and Groups*. Such products are possible because storage costs are near zero for Google.

A benefit of these applications is the ability to attract more eyeballs - which attracts more advertising dollars. In theory, Google can also use all usage information to gain insight into the minds of users and increase the relevancy (and click-through-rates) of their ads. However, such an endeavour could have serious privacy implications and backlash among users.

**Mobile, GEO, and Enterprise**
Our list of services is by no means exhaustive. Google provides products for enterprise customers (such as *Search Appliances*). *Maps* and *Earth* help users navigate maps and explore the world from their desktop. It is quite active in the emerging mobile market. Last but not least, it frequently releases experimental products which depending on user reaction might eventually be added to its portfolio.

**Market Developments**
As stated, Google spends the majority of its efforts focused on Search and Ads. It started only with Search, and entered the Ads market later a few years later (see Chapter 2). In the past year, Apps is entering their main portfolio. Because of Google’s experimental approach to product development (see Chapter 4), making small tests, and letting the market choose which products to feed, there are not many cases of spectacular product failures\(^1\). Recently, diversifying past its core business is becoming more of an issue (see Chapters 6 and 7).

**Organization**

**Company Type**
Google Inc. is a publicly traded corporation, with its main headquarters, the *GooglePlex*, located in the US. It has major offices all around the globe. It has a large market capitalization (approximately $140B). The company has a limited operating history, founded in 1998 with its initial public offering taking place in 2004. Its founders, Larry Page and Sergey Brin, hold nearly 60% voting power. The company operates in the Internet software & services industry.

**Company Structure**
Information regarding the internal structure of Google is scarce. Judging by the available information, Google seems to fit best into Mintzberg's *innovative organization*.

For one, it spends approximately a quarter of its gross profit on R&D. Google has more than 20 research centres worldwide, and additionally, all engineers are engaged in the innovation process (See Chapter 4).

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\(^1\) Two cases are the closure of Google Answers, and removal of commercial video offerings on Google Video.
Second, Google lacks a hierarchical structure. Despite having 18000 employees, it is not segmented into business divisions. Most employees “wear many hats” - implying some kind of matrix structure. The hiring process is also somewhat ad-hoc.

Finally, Googlers do not work in a formal atmosphere - “geekyness” seems to be a corporate value. Free food and snacks are provided, working hours are flexible, and the company’s official philosophy is that “you can be serious without a suit” [2]. All mentioned attributes are hallmarks of an innovative organizational structure.

**The Cloud**

As a closing to this chapter, we will describe a platform developed and used internally in Google, the so called Cloud. The conventional industry wisdom is to use expensive servers for websites that need to be always available, and for safeguarding customer data. However, using its proprietary software, Google achieves the same productivity using many “cheap” PCs. It has an infrastructure of over a million commodity computers worldwide [3]. The Cloud infrastructure is extremely scalable. It is why Google search is fast, and that Gmail can provide unlimited storage capacity. And, it frees them from technical dependencies on third parties. These all translate into competitive advantage. It does however pose the disadvantage of needing extreme amounts of power to operate.
1. Value Chain and Value System

Introduction
Firms strive to create value for the buyers of their products that exceed their own cost of creating it, and capture as much of this value as they can for themselves. Google is no exception to this rule, and like any other firm, it faces competition in achieving this goal. To sustain its superior value, a correct competitive strategy must be chosen and implemented.

In this chapter, we will systematically analyze the different activities that Google undertakes to create value (the value chain) and how these fit into the larger stream of activities of its suppliers and channels (the value system). We shall use the frameworks originally presented by M. Porter [4].

Strategic Perspective
We opt for an industry based perspective in our analysis. Industry based strategic management uses an outside-in process, and aims at maximizing profits and maintaining a defensible position. Our motivation for choosing this perspective is that we suspect Google is using the resource-based perspective and wish to tackle the problem from a different point of view.

Value System
Google’s value system is quite unique. It generates revenue by delivering online advertising, thus its’ customers are advertisers. However, finding the suppliers is somewhat trickier. The key lies in deciphering what the suppliers actually supply. Since advertisers are interested in audience, Google’s suppliers will be its end-users and partner sites who deliver user traffic to it. This is illustrated in Figure 1.

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Figure 1 - Google’s value system
Power Balance

We will use the five competitive forces framework of M. Porter to analyze the power of the players involved in the value system, and complete it with statements from Google’s annual reports. This is illustrated in Figure 2.

Power of suppliers: Google’s suppliers enjoy great power. End users come to Google because they provide relevant and useful search results, and “if Google is unable to provide quality products and services, then users may become dissatisfied and move to a competitor’s products and services”. Thus Google cannot compromise on user satisfaction.

Google Network members display ads on their web sites (using AdSense). In 2006 they accounted for 39% of Google’s revenues, with AOL alone accounting for 7% of total revenues. Partners receive most of the fees obtained from advertisers! This practice “is expected to continue for the foreseeable future”2. Additionally, web publishers can terminate their contracts whenever they wish. Furthermore, powerful partners have minimum payment guarantee clauses. All of these data highlight the bargaining power of suppliers.

![Diagram](image)

Figure 2 – Google and the five competitive forces

Power of customers: Google’s customers have little room for bargaining. Google provides “high ROI” to advertisers, coupled with an auction-based pricing (i.e. customers name their own price). Google (through algorithms) in return decides on the quality of an ad, and might for instance decide not to show it.

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2 The portion of fees paid to Google Network members is recognized under “traffic acquisition costs” in financial statements
Rivalry inside industry: “Google faces formidable competition in every aspect of its business, particularly from companies that seek to connect people with information on the web and provide them with relevant advertising”. In 2006, Microsoft and Yahoo were considered the primary competitors, in addition to others.

Threat of substitutes: Large advertisers allocate most of their advertising budgets to traditional media and only a small portion of it to Internet ads. This hampers revenue growth opportunities and must be overcome in the long run.

Threat of new entrants: Due to the size of the online advertising market, many start-ups and established firms try to enter it. Despite the existence of significant barriers to entry, the trend towards “industry consolidation” can help overcome the barriers and make this threat plausible.

Value System Developments

“Online advertising is an immature industry that has undergone rapid and dramatic changes in its short history.” Some of the major developments in the value system in the past years are listed in Table 1.

Table 1 - Summary of Value System Developments

<table>
<thead>
<tr>
<th>Development</th>
<th>Consequence / Motivation</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisition of YouTube</td>
<td>Decrease supplier power (less dependency for network traffic)</td>
<td>2006</td>
</tr>
<tr>
<td>Acquisition of DoubleClick</td>
<td>Decrease rivalry</td>
<td>2007</td>
</tr>
<tr>
<td>Possible Yahoo-Microsoft Merger</td>
<td>Increase rivalry</td>
<td></td>
</tr>
<tr>
<td>New Google Services (GEO, Docs, ...)</td>
<td>Decrease supplier power (less dependency for traffic); Raise barrier to entry</td>
<td></td>
</tr>
<tr>
<td>More International Presence</td>
<td>Decrease supplier power (by Increasing user base)</td>
<td></td>
</tr>
<tr>
<td>Increase of Mobile Internet Use</td>
<td>Increase supplier power (mobile carriers)</td>
<td></td>
</tr>
<tr>
<td>Development of Android OS</td>
<td>Decrease supplier power (mobile carriers)</td>
<td>2008</td>
</tr>
<tr>
<td>Expiration of PageRank Patent</td>
<td>Increase rivalry</td>
<td>2011</td>
</tr>
</tbody>
</table>

In addition to operating in a highly competitive and volatile industry (which has a bubble-burst in its resume), regulation and social trends also affect the value system. Various regulations surrounding the online industry are in flux and changes in them can have serious consequences for Google. These include tax laws, liability laws, privacy compliance requirements, infringement lawsuits, and regulations surrounding network neutrality.
**Value Chain**

We now turn our attention to the value chain, or the activities inside Google that create value. As stated, Google takes in as input *user traffic* (from its own websites, or partners), and processes this traffic (by means of user demography, keyword and content analysis, advertiser quality) to generate cost effective, targeted advertising. The chain can be seen in Figure 3 and is based on Porter's generic value chain.

![Value Chain Diagram](image)

**Primary Activities**

A rather unique aspect of the value chain is that the *operations* activity is performed mostly by *software*. In many firms, technology plays a supportive role, but in this case it constitutes a primary activity. In addition to the AdWords system, the engineers maintaining the data centres are also part of operations.

In a similar line of reasoning, the *inbound logistics* activity is handled by software: Search and Services (that bring in end-user traffic), and AdSense (that brings partner traffic).

Judging from the number of employees in each function, (Figure 4), we can observe that *sales and marketing* also plays a substantial role in adding value. This includes *vertical market specialists* who help customers set up more efficient campaigns; In addition to their efforts directed at promotion of the Google brand.³

*Service* activities include various software tools that help customers control and analyse their ad campaigns. A premium service-level support also exists for large advertisers.

³ In 2007, Google was named the world’s most valuable brand by *Brandz Research*
Supporting Activities
The supporting activities too contribute significantly to added value. Human Resource Management is critical in recruiting and retaining talent and in fostering the innovative culture of the company. Technology is omnipresent, such as: research and development of new products and services; IT systems that run through the whole company; and the Google cloud data centres. Finally, the infrastructure - among its other tasks - includes the legal services that protect Google’s intellectual property, and protect it from damaging lawsuits and regulations.

Value Chain Developments
The value chain has seen some changes during the past few years, although not as much as the value system. The changes are needed to remain ahead of competition, and also induced by growth. The major developments are summarized in Table 2.

Table 2 - Major developments in Google’s value chain

<table>
<thead>
<tr>
<th>Development</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity scope</td>
<td>“Google began as a technology company and has evolved into a software, technology, internet, advertising and media company rolled in one” – This affects the whole chain.</td>
</tr>
<tr>
<td>Headcount</td>
<td>Headcount has multiplied by a factor of 10 during the past five years</td>
</tr>
<tr>
<td>Acquisitions</td>
<td>More than 50 acquisitions during the past years have added new parts to the chain</td>
</tr>
<tr>
<td>Software improvements</td>
<td>Because software is performing logistical / operations / support activities, changes in them affect the value chain.</td>
</tr>
</tbody>
</table>

4 The cloud enables “significant improvement in the relevance of search and advertising results, and allows innovation to be pursued more cost effectively”
Conclusion

Having discussed the value chain, it is evident that the most competitive parts are the AdWords programme (operations), and Search (inbound logistics). Our reasoning is that these are the main activities that enable Google to differentiate itself from others. Although the overall activities of the value chain have remained the same, developments are happening in activity scope, headcount, acquisitions, and software. The value chain is leaning towards change.

Google’s position in the value system is not powerful. It is pressured by suppliers (i.e., end-users and partner websites) who can defect to rivals with little switching costs. The dominance of the suppliers and the intensity of the rivalry in the Internet industry make the value system volatile and dynamic. The relation between Google’s value chain and value system is shown in Figure 5.

Finally, analyzing Google’s strategy from the industry perspective, we see that (1) it has selected a profitable industry, and (2) opted for differentiation. (3) It has used a complete set of products and activities, such as technological innovation, branding, and backward integration, to secure a top position for itself. Consequently, these actions have translated into high performance (profitability and growth). These parameters collaboratively indicate a stable strategy.
2. Company Evolution

Introduction
In this chapter we take a look at the relations between Google’s value drivers, business evolution, and the underlying business functions.

Position in the Evolution Matrix
Google can be classified as a company belonging to the networked economy. By looking at the services it offers to both advertisers and users we can see that its level of business evolution is mass-individualization.

The AdWords service offered to advertisers allows them to choose keywords and target demographics for which the ads should be shown. Advertisers also announce the price they are willing to pay. Effectively this means there are as many service variations as there are customers. Google furthermore assists its customers in making these choices, so that they can create the most efficient ad campaigns suitable for their needs. AdWords customization is fully automated and hence can be called mass-individualization.

The same goes for Google’s offerings for users. In addition to multiple forms of search, Google provides tools that help users create personal content. For example, iGoogle enables users to choose gadgets to view on their homepage. Another instance would be Google News Alerts in which users decide the topics on which they want to receive news. Compare this to traditional newspapers and television channels which are industrial heterogeneous page: There are plenty of options to choose from, but it is not possible to “fine-tune” them.

However Google was not always a mass-individualized company. It started with only one service – search, which it also licensed. The search engine behaved similarly for all users. In that era, Google was only focused on making the search engine faster and bigger. We can characterize this phase as industrial homogeneity, driven by efficiency.

After reaching acceptable levels of reliability and scalability, Google finally removed the beta label from its search services, and focused on adding more services. At this time it created the initial version of AdWords (without cost-per-click pricing), and offered its services in 10 languages (for different geographical segments). Google was an industrial heterogeneous company at this point, but it continued exploring its opportunities. Figure 6 shows Google in the business evolution matrix.
Figure 6 – Google’s Evolution

Business Functions and the Evolutionary Position

According to Van Asseldonk, companies have four core business functions: marketing, supply chain, information systems, and organization. (These are somewhat similar to the value chain activities). In various phases of a company’s evolution, these functions have different forms and characteristics [5]. Our purpose in this paragraph is to see what evolution phase best describes each of Google’s business functions and from that later conclude whether or not cohesion exists between the functions and the evolutionary position.

Marketing

Google’s marketing for AdWords is different for small and large customers. Google promotion relies on branding and the visibility of its service (The “Ads by Google” and “Sponsored Links” logos on web pages). Interested advertisers can sign-up on the AdWords site, and automated tools will help them setup the service suitable for them. This form of marketing is responsive and personal, hallmarks of mass-individualization.

For larger advertisers however Google relies on its experienced sales force. The sales force hosts specialists in creating ad campaigns for different verticals. This segmentation is similar to what happens in industrial heterogeneous companies. Consequently Google’s marketing function lies between heterogeneous and individualized.

Supply Chain

The supply chain of Google (as we have previously seen in Chapter 1) consists of inbound user traffic which is converted in real-time to relevant, targeted ad-space. User traffic is a continuous flow, and it is matched to advertiser needs (pull), characteristics of a supply chain in mass-individualisation.
Information Systems
There is not much public information on the tools that Google uses internally for its internal communication and information structure. However we know that they have one of the most advanced distributed computer systems in the world (the Cloud), which has unlimited capacity and uses advanced algorithms. The observable facts predict information systems that are at mass-individualized level of competency.

Organization
As explained in chapter 0, Google is an innovative organisation. It is obsessed with quality (having an excellent “user experience” and the most relevant results), and are constantly improving in this area. They don’t have much hierarchical structure but rather employ organic, flexible network of teams with a central binding vision. These are characteristics of a company organization in the mass-individualization phase.

Development over Time
Although today we see relative coherence between the business function, this was not always the case. Initially Google’s organisation was more entrepreneurial, and its computer systems more centralized (all belonging to the heterogonous phase). Their marketing and supply chain belonged to homogenous companies: the ad space was sold in bulk contracts “pushed” towards certain clients, and licensing the search technology also has a similar story. Today, all the functions have developed.

Conclusion
As mentioned in the text, Google – like many other firms in the online advertising and search industries – competes as a mass-individualized firm. Its AdWords product allows customers to choose copies, select target groups, and name their own price. Similarly, other user services also allow extensive customization. This business evolution (over time) was shown in Figure 6.

Google’s business functions are mostly in the mass-individualized competency level as well. We can name some of the key characteristics: The supply chain takes in a continuous flow of traffic and matches it to relevant advertisement. Information systems are built on a distributed architecture. And the organisation is composed of networked organic teams following the Google vision.

Only marketing lags a little behind. For small to medium size advertisers, marketing is performed on the mass-individualization level, in a responsive and personalized manner. However, for large customers vertical segmentation is used, effectively making this function partly heterogeneous. The complete relation between Google’s business functions and evolutionary phase is shown in Figure 7.
Overall we see cohesion between the major business functions’ evolutionary levels. The marketing functions lag is a result of the online advertising industry not being fully developed yet and not a fault of Google per se.

We also see cohesion between the business functions and Google’s current evolutionary phase. This was not the case in the past few years, and indicates a maturity of the firm. Today Google is healthy and in balance - evolution-wise - and this might be one reason why it is ahead of its competitors.
3. Operational Value Creation

Introduction
In this chapter we will evaluate Google’s success at value creation using three different approaches: looking at how well they accomplish their stated goals; looking at their financial statements; and additionally by using the D-E / P-V models created by van Asseldonk. Afterwards we will do the same evaluation for Yahoo, and finally compare the two competitors in this aspect.

Company Goals
By looking at annual reports, stockholder meetings, and leaked company memos [blogscoped.com] we can list the following goals stated by executives for the company:

- Constantly improving Google search to provide the most relevant and useful search results. Accomplishments in this area include “universal search”\(^5\), elimination of spam, and growing the index.

- Providing the most relevant and useful forms of advertising. This includes improvements to the AdWords and AdSense services, and also experiments with targeted radio advertisement.

- Making Google tools accessible everywhere, such as on mobile devices, and in different languages.

- Rolling out services that enable content creation and communication to users (such as GMail, Blogger, and Google Docs).

- Remaining innovative and becoming recognized as a top Artificial Intelligence lab.

Performance Analysis in Regards to Goals
Judging by facts and figures such as: increase in the search market share (examples presented below); increase in advertising revenues; significant broadening of product portfolio (refer to Chapter 0); number of published research papers; etc; we can conclude that Google has been relatively successful in moving in the direction of its stated goals. However it should be noted that the goals are rather qualitative, so a strict black/white judgment is not applicable. For example, albeit being the number one in search, they have only implemented 5% of their ideal search capabilities [Source: stockholder meeting 2007].

\(^5\) By universal search it is meant including additional results from sources other than web, such as books and videos.
Figure 8 - search engine market share May 2007 [internetworldstats.com]

Table 3 - search engine market share change 2006 vs. 2007 [comScore]

Financial Performance

Google’s financial statements are rather healthy.

Table 4 and Table 5 summarize Google’s financial statements for 2003-2007. Looking at the numbers, we can see a yearly increase in revenues and profits. Figure 10 illustrates this point graphically.

Despite doing well, Google stock has recently experienced volatility (Figure 9), due to investor concerns regarding growth and a possible Microsoft-Yahoo merger.
Liquidity

Google, like many other IT companies, is what’s typically known as a “cash cow”. It has nearly $15 billion cash in the bank, and zero debt (Table 5). The reason for this huge stockpile of cash in software / services companies is that they create a high added value, with out needing to invest in plants or inventories. Moreover, Google does not pay dividends, so the free cash flows accumulate. This “war chest” can be used for acquisitions and possible rivalry clashes.
Table 5 - Google’s Consolidated Balance Sheets 2003-2007

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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash &amp; Short Term Investments</td>
<td>14,218.61</td>
<td>11,243.91</td>
<td>8,034.25</td>
<td>2,132.30</td>
<td>334.72</td>
</tr>
<tr>
<td>Total Current Assets</td>
<td>17,289.14</td>
<td>13,039.85</td>
<td>9,001.07</td>
<td>2,693.47</td>
<td>560.23</td>
</tr>
<tr>
<td>Total Assets</td>
<td>25,335.81</td>
<td>18,473.35</td>
<td>10,271.81</td>
<td>3,313.35</td>
<td>871.46</td>
</tr>
<tr>
<td>Total Current Liabilities</td>
<td>2,035.60</td>
<td>1,304.59</td>
<td>745.38</td>
<td>340.37</td>
<td>235.45</td>
</tr>
<tr>
<td>Total Debt</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.99</td>
<td>6.61</td>
</tr>
<tr>
<td>Total Liabilities</td>
<td>2,646.13</td>
<td>1,433.51</td>
<td>852.86</td>
<td>384.3</td>
<td>268.82</td>
</tr>
<tr>
<td>Total Equity</td>
<td>22,689.68</td>
<td>17,039.84</td>
<td>9,418.95</td>
<td>2,929.05</td>
<td>602.64</td>
</tr>
</tbody>
</table>

Financial Ratios

Table 6 shows Google’s key financial ratios for 2003-2007. All figures are higher than industry averages, showing Google’s unique value proposition. The comparison to the industry average and the S&P 500 index can be seen in Table 7 [Source: MSN Money Central]. It can be seen that Google is growing faster than the average of its industry, while at the same time being more profitable.

Table 6 - Google Key Financial Ratios, 2003-2007

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>12.12%</td>
<td>12.05%</td>
<td>14.27%</td>
<td>16.66%</td>
<td>16.59%</td>
</tr>
<tr>
<td>ROE</td>
<td>17.53%</td>
<td>13.63%</td>
<td>15.56%</td>
<td>18.06%</td>
<td>18.53%</td>
</tr>
<tr>
<td>Gross Margin</td>
<td>57.31%</td>
<td>53.94%</td>
<td>58.02%</td>
<td>60.16%</td>
<td>59.93%</td>
</tr>
<tr>
<td>EBITDA Margin</td>
<td>26.78%</td>
<td>24.73%</td>
<td>37.65%</td>
<td>38.87%</td>
<td>36.47%</td>
</tr>
<tr>
<td>Operating Margin</td>
<td>23.36%</td>
<td>20.07%</td>
<td>32.86%</td>
<td>33.48%</td>
<td>30.64%</td>
</tr>
<tr>
<td>Net Profit Margin</td>
<td>7.21%</td>
<td>12.51%</td>
<td>23.87%</td>
<td>29.02%</td>
<td>25.33%</td>
</tr>
<tr>
<td>Debt/Equity</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Current Ratio</td>
<td>2.4</td>
<td>7.9</td>
<td>12.1</td>
<td>10</td>
<td>8.5</td>
</tr>
<tr>
<td>Asset/Equity</td>
<td>1.4</td>
<td>1.1</td>
<td>1.1</td>
<td>1.1</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Table 7 - Google key ratios in comparison with Industry, 2007

<table>
<thead>
<tr>
<th></th>
<th>Google Inc.</th>
<th>Industry</th>
<th>S&amp;P 500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Profit Margin</td>
<td>26.9</td>
<td>23.9</td>
<td>12.9</td>
</tr>
<tr>
<td>Return On Equity</td>
<td>22.7</td>
<td>20.3</td>
<td>29.0</td>
</tr>
<tr>
<td>Sales Growth (Qtr vs. year ago Qtr)</td>
<td>57.6</td>
<td>51.4</td>
<td>12.9</td>
</tr>
<tr>
<td>Net Income Growth (YTD vs. YTD)</td>
<td>46.4</td>
<td>38.7</td>
<td>16.1</td>
</tr>
<tr>
<td>Current Ratio</td>
<td>8.8</td>
<td>7.2</td>
<td>1.2</td>
</tr>
</tbody>
</table>
**Growth of Profit and Revenue**

Figure 11 demonstrates the growth rate of profits for Google for the past five years. Several notable conclusions can be drawn from the graphs. First, gross margins (and revenues) follow what typically is known as the *S-curve*, indicating a rapid adoption rate after a slow start, and finally reaching a saturation point. This saturation of revenue streams makes Wall Street somewhat nervous.

Second, the profit margins show that Google has become more profitable as time has past, accounted for by a mixture of higher added value, and increased efficiency. However in 2006 we suddenly see a drop. Looking at the expense breakdown (Figure 12), we find that the drop is a result of capital expenditures doubling in 2006, reflecting notable plans for expansion (hiring people, securing facilities) and investment (technology infrastructure, including hardware and telecommunications capacity). The employee growth graph (Figure 13), backs up this observation.
Operational Cash Flow Development
The most interesting part is putting Google’s financial data into the model developed by van Asseldonk. The models are related to M. Porters generic strategies and can be used to see whether a company’s strategy is paying off or not (assuming it has one), and if so whether it is matches the words of its executives.

One difficulty in using the models arises from the fact that the models were created with European accounting principles in mind and Google’s data has to be adapted to fit the model. (Please see Appendix B for conversion explanation.)

Differentiation-Efficiency
In the model, efficiency is related to the number of employees required to create specific revenue; and differentiation is related to the ratio between sales and cost of sales. According to Porter successful companies either go for “cost-efficiency” or adopt product differentiation.

The D-E graph is rather particular. As can clearly be seen Google is moving towards increasing differentiation. Differentiation rates of 60% are quite high compared to the economy average, although typical in companies with significant value added (due to having a high technology advantage, such as in the software industry). Differentiation has flattened in 2007.

More interesting is that between 2003 and 2005, efficiency was also rising, but after that period it has dropped. Particularly in 2007, Google lost efficiency without gaining any extra differentiation. The reason for this performance is that since 2006, Google has invested heavily in new initiatives (see Growth of Profit and Revenue section above) and has been hiring rapidly. Due to an increasing number of products, it is also experiencing what is typically known as diseconomies of scope.

![Google Employee Growth, 2003-2007](image)
Performance-Volume

In the model, volume is equivalent to sales (which has annually increased by around 60% for the past five years). Performance is a figure indicating the amount of efficiency we are losing for the differentiation we are gaining.

As can be seen from the graph, Google has done well and constantly increased both its volume and performance for the past few years. The increase in performance is partially a result of learning by doing. However, due to the flat differentiation for 2007 mentioned above, performance has slightly decreased for this year. This also coincides with the S-Curve phenomena explained in the financial section.
Conclusion on Google’s Operation Value Creation

As we saw, Google’s self-defined success criteria revolve around its mission statement of “organizing the world’s information organize and making it universally accessible and useful”. The company has been making steady progress in this direction. Today Google has broadened its product portfolio and enjoys being significantly ahead of its competitors in search and online advertising.

In financial terms, Google has stated in its founders letters that its focus is on long-term value creation for shareholders rather than quarterly results. Despite this goal, its short-term gains have been impressive and better than the industry average. Recently however its share prices have fluctuated due to investor anxiety about competition and slowing growth (Figure 9).

Analyzing Google’s five year operational cash flow developments using the D-E graph (Figure 14) we see a clear differentiation strategy in steady progress. This is consistent with the company’s focus on having the most relevant search results and the most relevant advertising – the word “most” emphasizing differentiation compared to the status quo. This added-value is recognized by users and customers, and effectively captured by Google in both monetary terms and brand value. Efficiency on the other hand, initially rose, but later declined in 2006, due to long term investments and diseconomies of scope.

Continuing the analysis, we see in the P-V graph (Figure 15), that Google has been growing in volume and increasing performance at the same time for the past five years. This indicates a sustainable business model. However in 2007 performance has slightly dropped.

Operational Value Creation at Yahoo

In the next part, we will compare our findings on Google’s operational value creation with does of its main competitor, Yahoo. We will start by presenting a shortened version of the chapter written by fellow colleague Oscar Castaneda, who has been studying Yahoo.

Operational Success Criteria

Yahoo!’s operational success criterion consists of strategic objectives and goals that contribute towards meeting those objectives. The most recent strategic objectives were established a few months after co-founder Jerry Yang stepped up as CEO6 and were announced during Yahoo!’s Q3 earnings conference call in 2007. The strategic objectives are:

- To become the starting point for the most consumers on the Internet;
- To establish Yahoo! as the “must buy” for the most advertisers;
- To deliver industry-leading platforms that attract the most developers.

Several goals have been established to achieve these strategic objectives. Some of those goals7 are:

---


7 Adapted from Yahoo! Q3 2007 and Q4 2007 earnings calls.
• Continue to invest, innovate, and create whatever is necessary to gain more consumers.

• Create a motivated community of developers

• Accelerate overall advertising revenue growth by the end of 2008.

• Increase the percentage of total online advertising “demand touch” to 20% of the addressable market over the next several years.

• Grow visits to key Yahoo! starting points and properties by approximately 15% per year over the next several years.

• Leverage strengths and anchor properties to create the most compelling and innovative products and services.

• Change the game in Search and increase overall share of search queries.

• Generate the maximum long-term value for assets.

Performance Analysis
The strategic objectives driving Yahoo!’s developments in value creation are part of a coherent strategy that is ultimately aimed towards achieving differentiation. By becoming the starting point for users and by satisfying their needs, Yahoo! is attempting to create lock-in through quality that users will start-off with and come back to, which would essentially mean conquering one of the greatest challenges in the Internet industry, namely the lack of lock-in effects. Yahoo! realizes that “revenue from your locked-in customers is the return on the investment you have made in them.”

Financial Performance Analysis
The table below shows Yahoo!’s key financial figures for the years between 2002 and 2007.

<table>
<thead>
<tr>
<th>Company</th>
<th>Year</th>
<th>Net Profit</th>
<th>EBIT</th>
<th>EBITDA</th>
<th>EBITDA</th>
<th>ROI</th>
<th>ROE</th>
<th>ROA</th>
<th>Gross Margin</th>
<th>Total Op. Expense</th>
<th>Break-even</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yahoo!</td>
<td>2002</td>
<td>$107</td>
<td>$88</td>
<td>-$21</td>
<td>-$21</td>
<td>0%</td>
<td>2%</td>
<td>2%</td>
<td>83%</td>
<td>$865</td>
<td>$1,042</td>
</tr>
<tr>
<td>Yahoo!</td>
<td>2003</td>
<td>$238</td>
<td>$296</td>
<td>$136</td>
<td>$136</td>
<td>2%</td>
<td>5%</td>
<td>4%</td>
<td>77%</td>
<td>$1,329</td>
<td>$1,727</td>
</tr>
<tr>
<td>Yahoo!</td>
<td>2004</td>
<td>$840</td>
<td>$689</td>
<td>$523</td>
<td>$378</td>
<td>5%</td>
<td>12%</td>
<td>9%</td>
<td>62%</td>
<td>$2,886</td>
<td>$4,655</td>
</tr>
<tr>
<td>Yahoo!</td>
<td>2005</td>
<td>$1,896</td>
<td>$1,108</td>
<td>$884</td>
<td>$711</td>
<td>8%</td>
<td>22%</td>
<td>18%</td>
<td>60%</td>
<td>$4,150</td>
<td>$6,917</td>
</tr>
<tr>
<td>Yahoo!</td>
<td>2006</td>
<td>$751</td>
<td>$941</td>
<td>$639</td>
<td>$401</td>
<td>5%</td>
<td>8%</td>
<td>8%</td>
<td>58%</td>
<td>$5,485</td>
<td>$9,456</td>
</tr>
<tr>
<td>Yahoo!</td>
<td>2007</td>
<td>$660</td>
<td>$695</td>
<td>$286</td>
<td>$36</td>
<td>2%</td>
<td>7%</td>
<td>7%</td>
<td>59%</td>
<td>$6,274</td>
<td>$10,634</td>
</tr>
</tbody>
</table>

Yahoo!’s net profits rose to a high of $1.9 billion in 2005 after which they declined to a four year low of $660 million. The company’s all time high ROE of 22% in 2005, and the associated decline in subsequent years, are witness to the fact of the fierce competition inherent in this industry sector. Nevertheless, it is also related to Yahoo!’s strategic changes during those years. Both competition and strategic changes have been crucial developments in the company’s evolution.

Operational Cash-flow Development

The table below shows key financial figures for Yahoo! for a more extensive period. Based on these numbers, Figure 16 and Figure 17 show the Performance-volume and Differentiation-efficiency relations.

Table 9 - Summary of Yahoo Financial Data 1998-2007

<table>
<thead>
<tr>
<th>Company</th>
<th>Year</th>
<th>Turnover</th>
<th>Employment costs</th>
<th>Depreciation</th>
<th>Non-op results</th>
<th>Tax</th>
<th>Net profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yahoo!</td>
<td>1998</td>
<td>$203</td>
<td>$147</td>
<td>$0</td>
<td>$0</td>
<td>$18</td>
<td>$26</td>
</tr>
<tr>
<td>Yahoo!</td>
<td>1999</td>
<td>$589</td>
<td>$271</td>
<td>$43</td>
<td>$38</td>
<td>$36</td>
<td>$61</td>
</tr>
<tr>
<td>Yahoo!</td>
<td>2000</td>
<td>$1,110</td>
<td>$489</td>
<td>$69</td>
<td>-$34</td>
<td>$188</td>
<td>$71</td>
</tr>
<tr>
<td>Yahoo!</td>
<td>2001</td>
<td>$717</td>
<td>$474</td>
<td>$131</td>
<td>$77</td>
<td>$11</td>
<td>-$93</td>
</tr>
<tr>
<td>Yahoo!</td>
<td>2002</td>
<td>$953</td>
<td>$545</td>
<td>$109</td>
<td>$88</td>
<td>$71</td>
<td>$107</td>
</tr>
<tr>
<td>Yahoo!</td>
<td>2003</td>
<td>$1,625</td>
<td>$734</td>
<td>$160</td>
<td>$46</td>
<td>$147</td>
<td>$238</td>
</tr>
<tr>
<td>Yahoo!</td>
<td>2004</td>
<td>$3,575</td>
<td>$1,153</td>
<td>$311</td>
<td>$476</td>
<td>$438</td>
<td>$840</td>
</tr>
<tr>
<td>Yahoo!</td>
<td>2005</td>
<td>$5,258</td>
<td>$1,556</td>
<td>$397</td>
<td>$1,092</td>
<td>$768</td>
<td>$1,896</td>
</tr>
<tr>
<td>Yahoo!</td>
<td>2006</td>
<td>$6,426</td>
<td>$2,147</td>
<td>$540</td>
<td>$140</td>
<td>$458</td>
<td>$751</td>
</tr>
<tr>
<td>Yahoo!</td>
<td>2007</td>
<td>$6,969</td>
<td>$2,662</td>
<td>$659</td>
<td>$131</td>
<td>$337</td>
<td>$660</td>
</tr>
</tbody>
</table>

Yahoo!’s Performance-volume (Figure 16), shows the confusion that came about with the Dot-com crash in 2000. After a period of increasing performance and volume, up to 2005, Yahoo!’s situation dramatically changed with a significant drop in performance with increasing volume. This coincides with the change in leadership and strategy in late 2006, at which the situation started improving.

![Figure 16 - Yahoo! P-V Graph](image)

The figure below shows at one extreme a drop in efficiency and increased differentiation that came about with the Dot-com crash, of which Yahoo! was a survivor. At the other end it shows a drop in efficiency, after a period of steadily decreasing differentiation, a result of increasing competition and strategic changes within the company. These conditions caused a dramatic turn in efficiency after a high in differentiation-efficiency in 2005.
Strategic Stability Analysis
Yahoo! has changed its strategy several times over the past few years. Most recently, in October of 2007 it announced yet another shift in strategy. Although such a change was in order, especially with the new vision of co-founder and new CEO Jerry Yang, such changes have a deep and far reaching impact in the company’s value creation capabilities. In this case, the changes have been mostly positive but still require further development.

The guidelines provided by three core strategic objectives, and its supporting goals, are effective in setting a clear direction for the company. However, these same objectives must be maintained in coming years in order to be most effective.

Conclusions on Yahoo!’s Operational Value Creation
Yahoo!’s financial performance has significantly decreased since 2005. The company has not been successful according to its own performance criteria; neither has it been successful according to standard performance criteria, all of which have decreased from highs in 2005.

The company’s strategic orientation, after new CEO Jerry Yang was appointed and the company revamped its strategy, is to increase differentiation. This is strongly supported by all three of the company’s strategic objectives and most of the current company goals.

In total, the company’s strategic direction was not successful after 2005. This is evidenced by the changes in top management and strategy, and supported by this financial value creation analysis. In short, the company’s strategic direction has been fairly unstable in the past 5 years indicating the importance of adaptability and agility in this highly unstable environment.

Comparison of the Firms
Strategic Differences
Comparing the strategies of the two firms, the first issue that draws attention is that Google has a clear and simple mission, while Yahoo has a long list of strategies and goals. This implies that Google is more focused, and has clearer priorities. The second issue that draws attention is that Google has a stable strategy, while Yahoo’s strategy has been confused and instable. In Chapter 5 and 7, we will see the role of this focus and stability in Google’s success.
Financial Performance Differences
In Figure 18 and Figure 19, we compare sales, net income, and return on equity for Google and Yahoo during the past five years. While in 2004 the two companies’ sales were identical, suddenly Google experienced exponential growth (typically called “crossing the chasm”). In terms of income and return on equity, Google is the more profitable firm. Please note that the high ROE of Yahoo in 2005 was due to interest income and not operational efficiencies. In short, the systematic financial differences between the two competing firms endorse the conclusion that strategic stability and focus are keys of operational value creation.

![Figure 18 - Comparison of Google and Yahoo Sales and Income 2003-2007](image)

![Figure 19 - Comparison of Google and Yahoo Return on Equity 2003-2007](image)
4. Organization of Innovation and Evolution of R&D

Introduction
Innovation plays a key role in Google’s culture and success. The company started from an innovation called PageRank, and during the years many more have followed. These innovations have helped Google remain ahead of its competitors and create enormous value.

Research & Development Organization
Google spent 13% of its income in 2007 on R&D related expenditures, and has over 20 research centres worldwide. The company uses a rather decentralized R&D approach, based on dispersed, small project teams and a relatively flat hierarchy. R & D efforts are split according to “Sergey’s law” shown in Figure 20. Additionally, all engineers regardless of function are expected to spend 20% of their time on a project of their own choice but not related to work.

Internal information systems are used elaborately. For example, with the help of a tool called “Product Snippets”, a central database is maintained that helps employees search what others are doing; “Google Ideas” is used to share and rate ideas for new projects; and “Google Moma” is the internally used collaboration and search platform. These tools help create some sense of order in an otherwise chaotic structure.

Short iterations and emphasis on putting users’ needs first are other fundamental characteristics of Google’s innovation process. Figure 21 details this iterative approach. User behaviour is analyzed by looking at Google’s server logs. After a need and solution is identified, prototypes of new ideas are either tested on select users, or showcased on Google Labs. Ideas that do not perform well are discarded after some time, and the winning ideas are rewarded generously. The rational for this trial and error approach is: “We don’t know what the next killer app is, but we’re likely to build it.”

9 The major R&D centres include four facilities in the US, facilities in Tokyo, Zurich, Bangalore, Haifa, Moscow, Seoul, Dublin, Shanghai, and others.

10 For instance, Google News was made by a Googler in his 20% time. After proving successful, he was awarded several million dollars bonus.
Innovation is also acquired. Since 2001, Google has acquired nearly 50 companies, examples of which include YouTube, Picassa, KeyHole, and dMarc. The criterion is that the innovation should be promising, but not necessarily profitable.

Top management completes the innovation process in two important ways: By adopting HR practices that encourage innovation; and by establishing a strong guiding vision (“organizing the world’s information...”) to keep efforts focused.

**Evolution of the Innovation Process**

Google executives argue that they have tried hard to keep the entrepreneurial spirit of the company and not turning into a traditional company, despite growing from 200 employees to 18,000 during the past few years. So far their practices seem to have scaled well with the need for any major changes in their innovation process. There have been some developments not related to organization size however.

One such development has been the active involvement of outside actors. On the industry level, Google has formed alliances like OpenID, OpenSocial, and Open Handset, with the stated aim of “increasing openness to enable everyone in their industry to innovate more rapidly and respond better to consumers’ demands.” On the consumer level, release of public APIs such as Maps API or Gadgets API has had similar effects. The latter has resulted in more than 50,000 new gadgets being developed by the user community for Google’s platform.

The other development in the innovation process has been increasing pressure from governments worldwide to influence Google’s services. One high profile case was in respect to censorship in China. China blocked access to google.com, forcing Google to eventually create a new www.google.cn domain that removes certain search results from the list. Another case is a European court ruling that Google has violated the copyright of a Belgian newspaper by posting extracts. Yet another example is the self-imposed rule of deleting all access logs after 18 months.

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**Important Innovations**

Google practices incremental as well as break-through innovations. Table 10 lists some of Google’s more important innovations during the previous years. It is interesting to note that innovations are happening in all areas, not just in products and services. Our list is not exhaustive; additionally it can be argued that Google’s whole business model is quite new and innovative as well (the particular *value system*).

**Table 10 - Major Google Innovations by Category**

<table>
<thead>
<tr>
<th>Category</th>
<th>Name</th>
<th>Brief Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service (Customers)</td>
<td>AdWords</td>
<td>Targeted online advertising. (Advertisements are shown that are <em>relevant</em> to what users are searching for, based on multiple criteria.)</td>
</tr>
<tr>
<td>Marketing</td>
<td>General Second-Prize Auction</td>
<td>Advertisers bid on how much they wish to pay for their ads. However, the winner ends up paying the amount specified by the bidder below him. This creates “fairness” and <em>stability</em>.</td>
</tr>
<tr>
<td>Channel</td>
<td>AdSense</td>
<td>Extending advertisement reach to partner websites. This has the positive effect of creating wealth for content providers.</td>
</tr>
<tr>
<td>Business Process</td>
<td>GFS, MapReduce, BigTable</td>
<td>These technologies are used internally to run the Google Cloud data centres. With the help of these technologies, Google has reduced costs by a ratio of 1: 10000, and hence managed to scale.</td>
</tr>
<tr>
<td>Service (Users)</td>
<td>PageRank</td>
<td>Original algorithm to determine the importance of a webpage.</td>
</tr>
<tr>
<td></td>
<td>Universal Search</td>
<td>Ability to search other sources (such as video and books) from one box.</td>
</tr>
<tr>
<td></td>
<td>Machine-based Translation</td>
<td>Automated translation of web-pages between languages which has won several AI awards.</td>
</tr>
<tr>
<td></td>
<td>GMail</td>
<td>First email service to offer 2 GB storage, email conversations and labelling</td>
</tr>
<tr>
<td></td>
<td>Google News</td>
<td>First fully automated news page dashboard.</td>
</tr>
<tr>
<td>Organization</td>
<td>20% Time</td>
<td>Engineers can spend 20% of their time on a project of their own choosing, some of which have turned into successful products.</td>
</tr>
</tbody>
</table>

The aggregate effect of these innovations has been a steady increase of market share (in core activities), and gaining the title of industry leader. Google sets the *rules of the game* and its rivals are constantly playing catch-up. Ultimately these translate into value creation for users, customers, and Google itself.

**Conclusion**

Google’s innovation process clearly resembles the 4th Generation model. At the core of the process lies state of the art technologies coupled with focus on user needs. Moreover, the process exists in a
network of actors, both internally, and externally. Figure 22 shows the 4G innovation model, and Table 11 shows the mapping between the characteristics of Google’s processes with the model.

Figure 22 - 4th Generation Innovation Process (M. Zegveld)

As mentioned in the “evolution” paragraph, the innovation process has remained more or less the same in regards to the firm’s internal culture; however external parties are playing a more important role the process.

As seen in the “major innovations” paragraph, Google is innovative in many aspects, from services it provides, to processes used internally. But if we were to define the underlying innovative strengths, we could name three: (1) “putting users first” mentality, (2) involving the whole company in innovation, and (3) having substantial lead-time and experience in search, compared to the competition [8]. Collectively, the 4th Generation system of innovation, has managed to create one of the world’s most innovative companies.
### Table 11 – How Google maps to the 4th generation innovation model

<table>
<thead>
<tr>
<th>Model Element</th>
<th>Related Facts About Google</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor conditions</strong></td>
<td>- Over 6000 people working in R&amp;D worldwide</td>
</tr>
<tr>
<td></td>
<td>- R&amp;D budget $2.1 B in 2007</td>
</tr>
<tr>
<td></td>
<td>- Information sharing and collaboration systems used elaborately</td>
</tr>
<tr>
<td></td>
<td>- Many well known academics are working for Google; high headcount of PhDs</td>
</tr>
<tr>
<td><strong>Chance</strong></td>
<td>- State of the art technology</td>
</tr>
<tr>
<td></td>
<td>- Experimental and iterative approach to innovation</td>
</tr>
<tr>
<td><strong>Firm structure, strategy, and rivalry</strong></td>
<td>- Simple yet comprehensive vision(^{12}) guides firm</td>
</tr>
<tr>
<td></td>
<td>- Operates in highly competitive industry with low lock-in barriers</td>
</tr>
<tr>
<td></td>
<td>- Innovation is company wide (20% time, HR practices)</td>
</tr>
<tr>
<td></td>
<td>- Flat company hierarchy ; small teams</td>
</tr>
<tr>
<td><strong>Demand conditions</strong></td>
<td>- Over 1.3 billion internet users worldwide need search</td>
</tr>
<tr>
<td></td>
<td>- $70 B online advertising industry market by 2010 (^{9})</td>
</tr>
<tr>
<td></td>
<td>- “Focus on the user and all else will follow” approach to innovation</td>
</tr>
<tr>
<td><strong>Related and supporting industries</strong></td>
<td>- Huge network of partner websites</td>
</tr>
<tr>
<td></td>
<td>- Horizontal alliances: <em>OpenID, OpenSocial, Open Handset</em></td>
</tr>
<tr>
<td></td>
<td>- Collaboration with universities : over 300 published papers</td>
</tr>
<tr>
<td></td>
<td>- Public code APIs encourage community innovation (e.g. <em>gadgets</em>)</td>
</tr>
<tr>
<td><strong>Government</strong></td>
<td>- Laws limiting “freedom of expression” worldwide</td>
</tr>
<tr>
<td></td>
<td>- Copyright regulations</td>
</tr>
<tr>
<td></td>
<td>- User data privacy and anonymity issues</td>
</tr>
<tr>
<td></td>
<td>- Network neutrality</td>
</tr>
</tbody>
</table>

\(^{12}\) “To organize the world's information and make it universally accessible and useful.”
5. Knowledge Management

Introduction
Company knowledge is defined as the surplus a firm creates that is more than the sum of the values of the stakeholders [10]. This knowledge does not come from the quality of the inputs, but is rather generated by the way a company governs the interactions between its stakeholders. In this chapter we shall first present two methods for measuring the company specific knowledge of Google, and look at the relation of this knowledge with its innovations. Afterwards we shall look at Google’s core stakeholders and how their interactions are governed to create such knowledge.

Core Competencies
Google’s core competencies can be defined as: market position, engineering talent, and infrastructure.

Engineering talent: Google hires highly skilled people and in combination with is innovative culture, uses it as a sustainable advantage in respect to rivals. This is most true in the area of search, where it has 10 years of “learning-by-doing” experience [8].

Market position: Google has a strong brand name and a dominant market share. Owning over 50% of the Internet search market consequently helps it capture a large percentage of the online advertising. Its loyal user base means new services become an instant hit with out the need for promotion.

Infrastructure: Google’s distributed computing infrastructure enables it to rollout services and implement algorithms not affordable by its competitors [11], giving it yet another competitive edge.

Market-to-Book Value
One common technique for quantifying company knowledge is the market-to-book value. The ratio gives insight into a company’s intangible assets and ability to generate value, as recognized by the market. As can be seen in Figure 23, since IPO in 2004 and up to 2007, Google’s market capital has steadily increased. This has been fuelled by strong financial results. During this period, MBV has always remained high (Figure 24). The apparent MBV decline was due to an increase in company equity / working capital from $3B to $23B, not market devaluation.

However, since January 2008, Google’s market value has dropped by 40%, indicating that investors have lost some confidence in Google. This is partially because of problems in US economy (NASDAQ dropped by 20% in the same period), as well as fears of a Microsoft-Yahoo merger, and uncertainties regarding Google’s newer investments. Despite all this, MBV still remains impressively high.
In short, Google’s MBV has always been above the high-tech industry average of 4.74, meaning that the market recognizes Google’s unique capabilities and knowledge. The volatility of the actual figure on the other hand, points to the short-comings of the MBV method.

**Residual Value**

An improved technique for quantifying the knowledge productivity of a company is based on residual value, a model presented by M. Zegveld. Residual value of a firm is the increased added value per employee that is not due to an increase in capital, on a yearly basis. Knowledge productivity calculated for Google using this technique is shown in Figure 25. As can be seen, the knowledge productivity is quite high (near 1.35 over five years), and stable (with R equal to 0.89).

A flattening of the curve has occurred since 2006, which needs explanation. Residual value is dependent on differentiation, and as seen in Chapter 3, Google’s differentiation flattened in 2006 and slightly dropped in 2007. But what does this mean? Knowing that Google’s net income has increased during this period, but knowledge productivity not, we can argue that money is being spent on projects that have not yet monetized.
Relation to Innovations

As concluded in Chapter 4, Google is an innovative company with a 4th Generation R&D process. This clearly reflects in the high knowledge productivity. Moreover, the actual innovations also reflect in the KP curve. During 2003-2005, Google was busy improving its established Search and Ads platforms, resulting in increasing returns and productivity, and the rise of KP. However, since 2006 it has been looking for new areas of expansion. One example is the massive investments in data centres [12] as a result of the new Applications initiative. Another is the recently unveiled Google Health platform\textsuperscript{13}. The fact that these new investments have yet to payoff is reflected in the flattening of the KP curve. We can expect that an upward spike in the KP curve will occur in the following years, if these initiatives prove successful.

Core Stakeholders

Unlike more established firms, Google does not publish a Corporate Social Responsibility reports. They do however have a “Code of Conduct” which together with the annual reports can help identify the following core stakeholders:

- **Users** of Google’s services
- **Advertisers** (customers who pay the bills)
- **Google network members** (partner websites and distributors who run Google ads on their content)
- **Employees**
- **Investors** (3\textsuperscript{rd} party shareholders)

The number of core stakeholders has increased during the past years. Users and employees existed since the start. Advertisers and Google network members came into play after the launch of AdWords in 2000, and investors since IPO. Since 2004, the composition has not changed.

\textsuperscript{13} Google has an attitude of not pre-announcing its upcoming products, making speculation hard.
Exchange Relations
We have summarized the interactions between Google and its stakeholders in Figure 26. The power of the stakeholders is not equal. Users are first. Google strives to have “the most loyal audience on the web” [Error! Bookmark not defined.], and subsequently users know it for high quality and useful products.

Next are the employees: Google is the #1 place to work for in the US [13], because it provides employees “flexibility, financial security, and opportunity to get things done”. The “don’t be evil” motto is also an important motivation for many. In return, Google expects loyalty, mandated in obligations such as “avoid conflict of interest” and “protect Google assets”.

Next in line are advertisers and partners. Advertisers choose Google because it provides them “targeted reach and measurable value” [14] - which can be summed up as high ROI. Most of the fees generated from advertisers through partner sites are given to the partners, creating for them an “important revenue stream” [12]. From advertisers and partners, Google expects loyalty. (This is also exemplified by the fact that AdWords and AdSense members can terminate their contracts at will).

Investors have the lowest power position. Google severely restricts their influence with a dual-class stock system, to ensure that it can invest in “high risk, high reward” projects. Furthermore it does not pay dividends. The founders state that only investors that are looking for “long-term welfare” and trust Google’s policies should buy its stock [15].
Business Characteristic
In communication with various stakeholders, Google emphasizes “putting users first” as its most important governing business characteristic. For example, the first obligation for employees is “serve our users” [16]. Similarly, they rationalize to shareholders that: “we believe the most effective, and ultimately the most profitable, way to accomplish our mission is to put the needs of our users first” [12]. They state this preference to advertisers by stating “if any element on a search result page is influenced by payment to us, we will make it clear to our users”. Finally, the top governing philosophy of the company is “focus on the user and all else will follow” [2].

This governing business characteristic is brand-oriented and simple, and sends a consistent and clear message to all stakeholders about Google’s priorities, and is without doubt an important part of their success to date [12].

Conclusion
Summing up, Google’s core competitive capabilities lie in its market position, engineering talent, and data centre infrastructure. It has successfully exploited these capabilities and the result is a high and stable level of knowledge productivity for the past five years (Figure 25). Its many innovations in search and online ads have contributed to its knowledge productivity.

Google’s core stakeholders groups are users, employees, advertisers, partners, and investors (Figure 26). The latter were added after the rollout of AdWords, and IPO. The main business characteristic governing the interactions between the stakeholders is “focus on the user and all else will follow”.


6. Corporate Strategy and the Role of Strategic Management

Introduction
In this chapter we will first look into what Google’s executives describe as their intended corporate strategy. We will than look back at our analysis from previous chapters, and combine them to find the actual corporate strategy that Google has been executing in the past years. We will see whether the executed strategy is coherent or not, where its strengths and weaknesses lie, and how it compares with the intended strategy.

Google’s Stated Strategy
Google defines its current product strategy as “Search, Ads, and Apps”. They articulate that search “was, is, and will be the killer app”, and that “it is not yet a solved problem”. They have more engineers working on search than any other company, expanding it in various ways. On Ads, they express that “targeted advertisement has informational value for users”, and that the advertising industry has used little automation so far. Nearly 99% of their revenue comes from targeted ads, and they see growth opportunities in similar markets, such as radio and mobile ads. Finally, in the apps domain, they are seeking applications that are designed for collaboration and store their data in the “cloud”. These applications fit with their search strategy (more content), and will be an important source of revenue in the years to come. They claim that overall, they have “a coherent strategy that solves real user problems”.

In order to reach these product goals, Google has various business strategies in place. These include “being focused on end-user choice”, “setting up tremendous innovation to avoid static release cycles”, “investing locally” worldwide, and “commitment to partnerships”. All of the above does seem to make sense and fit together nicely, however we have to see whether it is indeed the true story?

Google’s Strategy according to Analysis
We have summarized the conclusions of our chapters in Table 12. Most conclusions agree with Google’s proclaimed strategies: focus on users; having 4-G innovation system; ads and search as strongest activities. However, we do not see Apps as a strong activity yet (understandable since it is newly introduced); we also believe that Google’s commitment to partnerships is because of its not very strong position in the value system.

Our conclusions in all chapters were that Google’s strategy is stable and coherent: from the industry perspective (Chapter 1), in terms of evolution (Chapter 2), clear choice of differentiation (Chapter 3), in innovation (Chapter 4), and stable knowledge productivity (Chapter 5). These evaluations were however on individual aspects. In the next paragraph we shall see how they fit together in total.

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14 Such as increasing the type and quality of content indexed
Table 12 – Analysis conclusions from previous chapters

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Main Conclusions</th>
</tr>
</thead>
</table>
| 1       | Value Chain oriented towards change; AdWords and Search most competitive activities.  
          | Value System is dynamic. (reasons: power of suppliers, back-integration, rivalry, regulation)  
          | Strategy is **stable** from an Industry Perspective. (good industry, top position, profits) |
| 2       | Mass-individualized products.  
          | Mass-individualized competency level, marketing somewhat lagging. (industry circumstances)  
          | Strategy is **coherent** from evolution perspective. |
| 3       | Successful and progressing according to own goals (“organizing the world’s info...”)  
          | Financially health, however recent share price fluctuations (*why?*)  
          | DE graph shows **clear differentiations strategy**: PV graph shows sustainability. |
| 4       | 4th generation innovation system, mostly **stable**. (developments in external actors)  
          | Innovative in many aspects: services to processes.  
          | Innovative strengths: “putting users first”, involving whole company, lead-time in search |
| 5       | Core capabilities: market position, engineering talent, and data centres  
          | High and **stable** level of Knowledge Productivity. (innovations have contributed to this)  
          | Main business characteristic: “focus on the user and all else will follow” |

**Coherence of Strategy**

Figure 27 shows all the different strategic aspects combined together. It can be observed that Google is operating in the fourth level of evolution and all the different strategic aspects are in the same line – except for knowledge productivity. The fact that KP is high and stable is not in itself a bad thing. Quite opposite, it is rather particular. It means that Google has managed to constantly monetize its innovations, which according to theory is not usual for companies operating in the fourth level of evolution. Constant value creation indicates customers are constantly willing to pay a premium for Google’s service. This is a consequence of several things: First, a clear differentiation strategy. Second, keeping focus and improving on its core business. Third, listening carefully to its users. As a result of these, it has a sort of natural monopoly in the search and text-based ads areas, which none of its rivals can match (at least in the perception of users). This translates into financial value.

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15 An example of sticking to its core business is the decision “not to own the content”.
However, according to the industrial perspective this could change. Changes in the value system, which can be induced as a result of (1) competition (e.g., a possible Yahoo-Microsoft merger), (2) policy shifts, or (3) new social trends (e.g., people preferring to use social networking instead of search), can alter Google’s #1 position, and affect its capability to ask for premiums. Another cause of value system change could be Google’s active (4) search of new growth opportunities.

**Strong Linkages**

Due to the fact that Google lacks lock-in effects (“users are only a click away”), and “has a commitment not to take user data hostage” [17], the only way it can retain its market position is through constant innovation. In other words, innovation is the key pillar of the linkages. We can identify the following as strong linkages:

- **Innovation – Evolution**: Google has created the technological systems required for mass-customization as a result of its R & D efforts and capabilities.

- **Innovation – Operational Value Creation**: Constant innovation helps Google differentiate its products from its competition, and consequently earn premiums.

- **Innovation – Knowledge Productivity**: To have a high KP, you need lots of innovation, and vice versa, the cash generated from a high KP can fund more innovation.

For the sake of comprehensiveness, we should point out that there is also a rather obvious link between evolution (mass-customization) and operational value creation (differentiation).

---

16 Google acknowledges these issues as “foreseen challenges in growth, policy, and society” [17].
Weak Linkages

We can not immediately identify any weak linkages in Google’s strategy. However several threats can be identified. As already mentioned, changes in the value system can undermine Google’s coherent strategy. We identified four possible sources of this change, of which growth is interesting to look into more deeply. Google currently relies on just one source of income: AdWords. This is both risky and inhibits growth\(^\text{17}\). So Google has is looking for new opportunities, such as expanding internationally, into other forms of advertisement, or totally new domains.

Since these markets are new, and Google is not as yet experienced, it faces the possibility of not being able to differentiate effectively. For example in China, it is trailing behind Baidu. If it cannot differentiate, it cannot charge premium, and knowledge productivity will drop. Alternatively, it may lose focus due to growth, which again will cause a knowledge productivity drop. In the short run, this volatility of KP will move KP to the high / unstable box. However such problems in the long run would create financial constraints, consequently influencing the ability of the company to innovate.

In other words, a change in the value system can create changes in OPVC, KP, and Innovation. Of course none of this has happened yet. Our intent is to show that just because Google does not have any weak linkages at the moment and is enjoying considerable profits, it does not mean that its executives can rest assured. The volatility of its value system requires constant attention. In Chapter 7 we will take a look at the activities that Google has done to survive the changes of the value system in the past few years, as well as what lies ahead.

Conclusion

In Table 12, we summarized the conclusions from analysis of different strategic aspects of Google in previous chapters. Individually, each aspect was judged stable. Also most of Google’s claimed strategies were observed.

One step further, in Figure 27, we looked at how the different aspects fit together. A coherent strategy and a company in the fourth level of evolution can be witnessed. Strangely, knowledge productivity is high and stable. This indicates that Google’s customers perceive its services to provide much more value than the competition, persistently.

Finally, we identified strong linkages, between Innovation & Evolution, Innovation & Operational Value Creation, and Innovation & Knowledge Productivity. We did not identify any immediate weak linkages, but it is foreseeable that any changes in the value system can impact Google’s favourable position. We will take a look at this concern in more detail.

\(^{17}\) Part of the problem can already be seen: advertising revenue growth has slowed down in Q1 2008, causing investor fears. [Reuters, 28.03.08]
7. The Next Step

Introduction
In the previous chapter we identified Google’s strategy as coherent and judging from the company’s performance, successful. Logically, this means that the company should continue doing what is has been doing. However, it faces two challenges. In this final chapter, we will first look into why Google has been successful despite a volatile value system (and failure of its competitors); afterwards, an in-depth analysis will be done of the challenges and opportunities ahead; and finally a wrap up with our recommendation. We will formulate the answer to these questions using the industry perspective.

Why Google has been successful
Let us step back and take a look at the industry perspective pyramid (Figure 28). According to this perspective, the first step in implementing a successful strategy is choosing a prosperous industry. Online advertising matches this criterion: more than 1 billion consumers using the Internet makes this medium quite attractive.

![Figure 28 - Google and the Industry Perspective](image)

However, many companies know this, so the second step comes into play: choosing a unique position. For Google, this position is its unique ability to accurately match advertisement with the people seeking for the advertised product (known as targeted advertising). Achieving this position is what attracts advertising dollars—not offering cheap advertisement options, or advertising to the biggest audience possible.

The next step forward is choosing the necessary set of products, which we described in Chapter 0. This takes us to the most crucial step: choosing the right fit of activities to achieve the desired position [19]. Let us elaborate by asking a question: Why can’t competitors imitate Google’s model? Isn’t it simply providing useful search, and matching it with keywords? We know the answer is no, as Microsoft and Yahoo failures shows. The reason lies in the “fit”.
Although innovativeness is the enabler for Google, the fit is more a result of Google’s governance of its unique competencies. The knowledge management keeps every stakeholder focused, and sets clear priorities. For example, Google constantly improves its search offerings. This helps its business model by attracting more users, which brings in more advertisers. In other words, its mission statement reinforces its business model.

Table 13 lists a couple of Google’s activities that complete the “fit”. To illustrate our point, we will use a series of examples. Take the example of not keeping user data “hostage”. Google knows that in the long run, lock-in does not stimulate loyalty or enable it to do better targeting. It avoids such behaviour; contrary to Microsoft. Another example is avoiding the temptation to own content. Google believes that creating content does not help its goals, preferring to empower content creators and enable people find that content; contrary to Yahoo. A final example is awareness that a short term monetary gain does not defend its strategic position. It recently reduced the number of “accidental clicks” on ads - at the expense of missing Wall Street revenue expectations.

<table>
<thead>
<tr>
<th>Table 13 - List of Google’s complementing activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constantly improving search</td>
</tr>
<tr>
<td>Not keeping user date “hostage” (lock-in)</td>
</tr>
<tr>
<td>Not creating content</td>
</tr>
<tr>
<td>“Great just isn’t enough” [2] attitude</td>
</tr>
<tr>
<td>Reducing “accidental clicks”</td>
</tr>
<tr>
<td>Avoiding pop-ups</td>
</tr>
<tr>
<td>Not forcing products on users</td>
</tr>
<tr>
<td>Opening up its platforms</td>
</tr>
<tr>
<td>Translation of services in 110 languages</td>
</tr>
<tr>
<td>Keeping focus on core expertise</td>
</tr>
</tbody>
</table>

This coherent set of activities has created loyalty, and together with its expertise in artificial intelligence, helped it achieve a unique position that is immutable. For the author, the fit of the activities was not evident at the start of this analysis, and its activities appeared chaotic. However now I believe differently.

In addition to coherence, other factors that have helped maintain its position despite industry volatility include its flexibility and innovativeness (Chapter 4); and the fact that it is a young company that does not have lagging and conflicting products and mentalities.

**Google’s Challenges**

Google faces both internal and external challenges. Internal challenges (such as how to keep the entrepreneurial spirit of the company while scaling and maturing) are not of concern to us, for we have chosen the outside-in industry perspective. The external challenges can be categorized in two groups, challenges in established markets (due to value system volatility), and challenges in new markets (growth opportunities).
Challenges in Established Markets

Digging into the five forces model (Figure 2), we can extrapolate the following challenges:

1. Appearance of more targeted forms of advertisement that make text ads less appealing.
2. Users losing trust due to privacy allegations or “big man” image of Google.
3. Change of social trends in relation to the Internet starting point. Of the activities that people engage in online (Table 14 [20]), Google is only active in two. Should the other activities become more predominant, Google will face setbacks.
4. Economic recession and a decline in online advertisement budgets of customers.

To overcome challenges 1, 3, and 4, Google needs to diversify itself. It can try other forms of targeted ads, add new entry points\(^\text{18}\), and look towards international markets. However, by entering new ground, it will face additional challenges.

Challenges in New Markets

To defend its position in established markets, supplemented with the fact that being a “one trick pony” is quite risky, Google must explore new market opportunities. Lucky enough, it currently has so much cash that it can afford to experiment (Chapter 3). Figure 29 illustrates the new revenue sources that Google executives have publicly announced their interest in. Google does not enjoy the luxury of being #1 in any of these markets. Far from that, it faces intense rivalry, and the new industries are new turfs were it is comparatively inexperienced.

\[\text{Table 14 – What people do online}\]

18 A notable example is Google’s decision to offer free music downloads on its start page in China [TechCrunch]
However, an issue bigger than rivalry and lack of experience is avoiding what is known as the *growth trap*. Basically, the desire to compete in several ways at once can create confusion and undermine organizational motivation and focus, eroding a company’s competitive advantage. To avoid such an outcome, companies must grow inline with their current strategy, focusing on deepening their position rather than broadening and compromising it. In other words choosing to penetrate in needs and varieties where they are distinctive [19].

**Recommendation**

By looking at the various options available, our recommendation for Google is to **diversify by entering the mobile market with full force**. There are several reasons why this makes sense.

First, mobile phones provide an excellent opportunity for targeted advertising, since they are bonded to people, and are location aware. This very fine targeting is appealing for advertisers [21].

Second, focusing on mobile phones enables Google to reach billions of users in underdeveloped areas of the world - whose only hope of coming online is through cell phones. This is inline with Google’s mission of making the world’s information accessible to everyone.

Third, with the adoption of 3G networks worldwide, sooner or later mobile phones will be exploited as a new Internet starting point, and will be a direct competitor to Google’s current offerings. It is wise for Google to be one of the first movers in this area, if only as defence.

In short, the mobile advertising industry is a lucrative business, and inline with its current activities, so the growth trap can be avoided. However, to succeed in this industry, Google needs to commit considerable resources and find innovative solutions to address two obstacles: privacy concerns (extremely targeted ads might create consumer backlash); and competing with the incumbents. The incumbent handset makers and network operators enjoy considerable power and can crush Google’s efforts. To succeed, Google has to be the “**rule breaker**” in this new industry.

It should be noted that Google is already testing the mobile waters with products such as Maps for Mobile, and Android, part of its “**promising**” initiatives (Figure 20). Our recommendation is to turn the mobile platform into a primary focus. It needs to commit more employees to this area, and use its financial muscle for necessary acquisitions, in order to gain a favourable position.
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Figure 25 - Google Knowledge Productivity

Figure 26 - Interactions between Google and stakeholders

Figure 27 – Coherence of Google’s different strategic aspects

Figure 28 - Google and the Industry Perspective

Figure 29 - New revenue streams for Google
Appendix B: Extracting Financial Data

All data has been extracted from the financial statements available in Google’s annual reports 2004 - 2007. Google went public in 2004 and so data related to pre-2003 is not completely available and was excluded. Notes on extracting specific fields for the D-E / P-V graphs can be seen in Table 15.

Table 15 - Notes on extracting financial data

<table>
<thead>
<tr>
<th>Model field name</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turnover</td>
<td>Income statement (Revenue)</td>
</tr>
<tr>
<td>External cost (paid to suppliers)</td>
<td>Traffic acquisitions costs which are considered as part of “Cost of revenues” (stated in annual report notes)</td>
</tr>
<tr>
<td>Depreciation</td>
<td>Cash-flow statement (Depreciation + Amortization)</td>
</tr>
<tr>
<td>Interest paid / received</td>
<td>Obtained from income statement (Interest income). Google does not have long-term debts and consequently does not pay interest.</td>
</tr>
<tr>
<td>Non operational results</td>
<td>Unusual costs – Other income</td>
</tr>
<tr>
<td></td>
<td>Both figures are from financial statements. Unusual costs are a settlement payment to Yahoo in 2004, and contribution to google.org in 2005. Other income includes such things as foreign exchange transaction gains (losses), etc.</td>
</tr>
<tr>
<td>Tax</td>
<td>Income statement (provision for income taxes).</td>
</tr>
<tr>
<td>Net profit</td>
<td>Income statement</td>
</tr>
<tr>
<td>Employment costs</td>
<td>All remaining operating expenses</td>
</tr>
<tr>
<td></td>
<td>This figure includes salaries, stock compensation, and office space rents which can all be considered as employment costs. Mathematically, it should equal the sum of Sales &amp; Marketing, General &amp; Administration, Research &amp; Development costs, minus depreciation, added employee costs of Operations (see below).</td>
</tr>
<tr>
<td>Other revenues and expenses</td>
<td>Promotional costs + Estimated data centre costs</td>
</tr>
<tr>
<td></td>
<td>The first figure is available from notes to financial statements. The second figure is computed as “50% * (cost of revenue – traffic acquisition costs)”. The rational is that costs of operating data centres is recognized under cost of revenue which consists of staff, depreciation, and bandwidth / energy costs. We have estimated that 50% of this figure is for bandwidth and energy costs, and hence put it under this column. (Note: playing around with this percentage did not influence the model outcome.)</td>
</tr>
<tr>
<td>Extra ordinary results</td>
<td>Not used</td>
</tr>
</tbody>
</table>
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Author’s note: A challenge in writing this paper has been finding reliable information and facts, since Google has a manner of secrecy. In addition to Annual Reports and the company website, speeches of Google executives proved an invaluable source.

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