



15.576 The Economics of Information

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Google Apps for Enterprise Installed Solution

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V1.0

Dec 14, 2006

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1 Executive Summary

In order to increase Google Enterprise revenues beyond the current 2% of total corporate revenue, the Google Enterprise business unit is releasing a version of *Google Apps for your Domain*[™] for business users. This offering, comprised of Start Page, Gmail, Google Talk, Google Calendar and Google Page Creator, will be delivered as a hosted Software-as-a-Service (SaaS) solution.

However, since many larger enterprises are reluctant to embrace SaaS, Google is considering the offer of an installed “inside the firewall” solution to corporations. In order to effectively deploy this offering, Google needs to first understand the specific needs of enterprise users, as well as the requirements for delivering a solution to businesses as opposed to consumers.

Key objectives of this study are:

- Market Analysis
- Competitive Analysis
- Pricing Analysis
- Customer Segmentation
- Delivery Models Assessments
- Business Models Comparisons

This report analyzes the competitive market for the enterprise, suggests different strategies for achieving success “inside the firewall”, and proposes a potential successful outcome for Google.

The resulting recommendations are:

- Google should not try to compete with the dominant players (Microsoft and IBM) in the market for traditional installed software.
- Rather, focus on pure hosted SaaS solutions for small-medium sized enterprises
- Explore appliance models for larger enterprises. These appliances should include:
 - Hardware-appliances for medium-large companies that want easy installation
 - Software/Virtual appliances for large companies that need customizability
- Use subscription-based models to disrupt and co-opt software license based competitors. Using this business model should convert key users to a hosted Google solution and avoid the dilution of resources that would ensue if Google were to take installed software players head on.

According to our revenue projections, a successfully introduced appliance model using subscription fees could generate up to \$2.7 billion in annual revenues by 2010.

2 Introduction

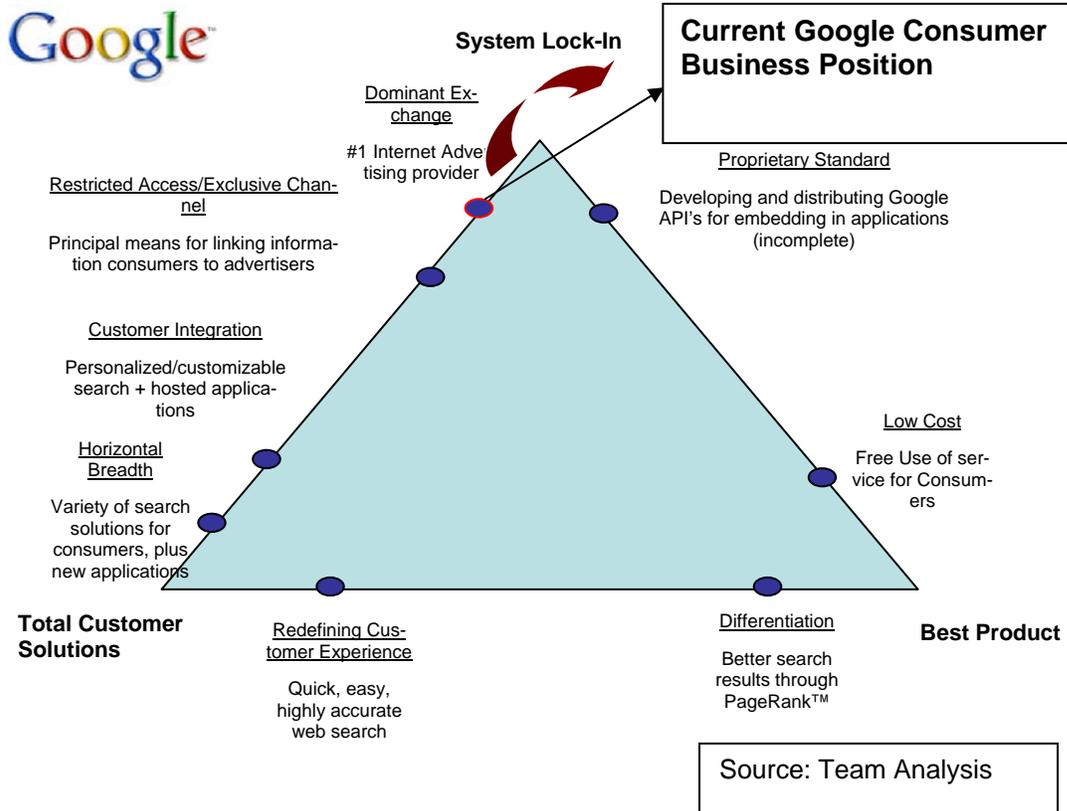
Few companies have demonstrated such substantial growth with profitability in modern times as Google. From inception in 1998 to the most recent quarter ended September 30, 2006, the company has grown from 2 to over 8000 employees and now generates over \$5B in revenue per year. The company has also managed to grow with minimal outside investment beyond the Series A round of \$26M and now has a market capitalization exceeding \$100B.

An examination of Google's business strategy reveals several keys to this success. Though starting late in the Internet search industry (after companies such as AltaVista, Yahoo, Excite, Ask.com and others), Google has quickly come to dominate consumer Internet search. As will be shown below via the Delta Model™ (Hax and Wilde, 2001), Google's success has come not only through a strongly differentiated technology position but also through an explicit understanding of the customer(s) as well as the complementors of its service. Google also has quickly understood the power of network effects in the use of its service, and that the Google service is part of a network of value spanning from advertisers to third parties and ultimately to customers.

In addition to the power over the advertising supply chain that Google exercises, the drive for new competencies within the firm has led to substantial innovation. For example, the Geospatial search product Google Earth, which debuted in 2004, has achieved significant market share in the product category especially after being highlighted during the Katrina disaster and other world events. Combined, these forces have enabled Google to achieve a position as the dominant exchange for consumer internet search.

Regardless of the success in the consumer arena, Google is facing significant challenges in corporate computing – less than 2% of the revenues of the company come from corporate or enterprise users. The other 98+% of revenues come from advertisers, who are not tied into long term, recurring revenue contracts and can cancel at any time. As opposed to internet consumers, who scan the web to look for documents from multiple sites, corporate users are primarily interested in doing deep analysis of information already inside their corporate databases, applications, and document management systems. In this arena, Google is not only a newcomer, but also the company does not have a clear position of technical leadership. With the advertising budgets from which the company generates the bulk of its revenues being subject to cyclical forces, it is important for Google to develop its Enterprise business in order to keep growing and provide a source of recurring revenue independent of discretionary forces.

An analysis of the consumer business versus the enterprise business can be utilized via the Delta Model™ to not only clarify the current strategic positions of each segment, but show the different strategic position. As seen below, Google has established itself as a leader in the consumer advertising-based business, having quickly moved from a position of Best Product to virtual System Lock-In in only seven years:



From its roots in Stanford's Computer Science department, Google has always been a technically focused company. The core intellectual property of the company is the trade secret method of ranking pages by links and citations. Google has continued to invest heavily in R&D as a percentage of total revenues. Because of great timing of capital raising, Google managed to accumulate some of the best information technology talent in Silicon Valley. With this stockpile of talent, the company continues to innovate in the core area of information retrieval.

Google differentiates itself from other companies in that there is a strong user-centered focus. New products are often co-developed with early customer input. It is a Google principle to release most products very early in "beta" form so that users have the opportunity to provide feedback. This user orientation is very distinct from the engineering-department release mentality of other firms and enabled Google to grow very quickly through end user references and word of mouth.

In addition to its expertise as a technology provider, Google has also implemented powerful economic concepts to enhance growth. One of the most important competencies Google has mastered is the creation of an ecology of complementors and complementary products. In addition to providing search functions for consumers to click on ads of interest, Google runs a program specifically designed to create complementors out of potential competitors, the AdSense program. Through AdSense, Google maintains a network of sites different from those of the advertisers. The Google Network sites are linked to Google through AdWords,

so that if users of those sites click on any of the AdWords, the advertisers pay Google a fee, which is then passed on to the Network member. Thus, Google has created a channel for the advertising-based revenue stream that does not rely solely on direct advertisers but also indirect-channel members. By creating this economic opportunity, Google has managed to achieve a level of bonding not only with customers but also with partners.

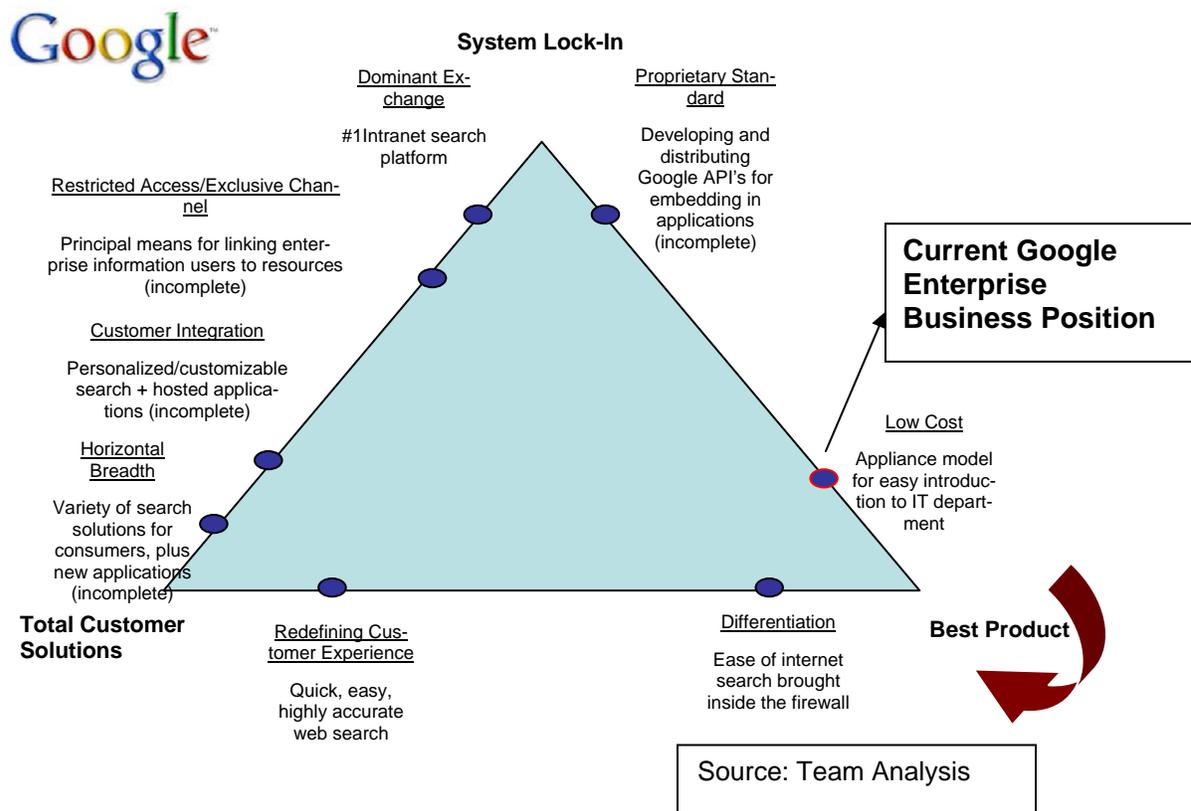
An additional domain where Google demonstrates strong competence is in the bundling of information products. Bundling of information goods has been demonstrated to generate consumer surplus as well as producer surplus in markets (Shapiro and Varian, 1999). Google has recently introduced bundles of applications and tools such as Google Pack, GMail, Google Apps for Enterprise, Google Base, and others, which create “stickiness” to the Google network for end users as well as increase switching costs. Through the use of these bundles, there is a “winner-take-all” effect, as users of Google search will increasingly use the applications bundles versus those of competitors. Because of these new bundles, many users that primarily used Google only for search now rely upon the company for all consumer-productivity tools that they use on the internet. These bundles collectively increase the premium users will pay in order to utilize Google services and also act as aggregators of consumer demand that Google will now have the ability to reshape. By shifting contents of the bundles, Google can tailor its revenue streams and create demand for more tightly segmented consumer offerings.

As a result of the productivity applications introduced, we should expect to see increasing network externalities, or network effects, in play. Google productivity application users will eventually begin to exchange data between themselves as well as with non-users of the tools. Non-users will begin to join the overlay network of users running on top of other Google services. As more users join, the intrinsic richness and value of the network will grow, creating a virtuous cycle. As a competitive strategy, especially with respect to installed desktop productivity tools providers, this strategy will create a long-term competitive advantage for Google, as the internet hosted tools will enable the network externalities to scale faster than they would in an installed desktop scenario.

As the user base of productivity tools grows, Google will be in a position to create more specific segments of customers. Differential pricing is one methodology by which this can be attained. Whereas certain low end users may only be willing to pay \$4.95 or \$9.95 per month for certain productivity services, “power” or corporate users, accustomed to buying desktop software, may pay \$50 or more monthly for only incrementally better tools. This first degree of pricing discrimination, or personalized pricing, would enable Google to optimize revenues on a similar technology platform across a wider spectrum of users. An additional method of pricing discrimination might also be implemented in the form of versioning. Especially in the case of power users, charging different amounts for different product lines and releases is a normal occurrence and would increase total revenues for Google. Finally, by segmenting users into different affinity groups or categories and charging different amounts for each group (students, retirees, veterans, etc), Google might offer group pricing and thus achieve third degree price discrimination.

In the enterprise, Google is competing against more entrenched vendors, and the strategic position of the company is not as powerful as that of the consumer business (see below). At present the company is at a crossroads where it is necessary to quickly establish a “Best Product” reputation amongst enterprise users while also driving very quickly towards deep integration with customer accounts to unseat competitors.

Once installed, Google may be able to exploit additional economic principles to increase top line revenue and strengthen customer bonding. One method of doing so is a different implementation of complementary products. Because of the hosting facilities currently available, by offering additional services to Google Apps users, such as storage or CPU power, Google can use these information complements to either enhance the experience with users, or derive additional revenue. By giving away additional services such as storage or allowing end users to scale up their applications across more CPU’s, Google would differentiate itself from existing enterprise vendors, as well as integrate more deeply with customers. Given Google’s extensive investment in fixed costs and infrastructure, the marginal cost of these complements is very low. By subsidizing the enterprise market with the “free” goods of storage or CPU power, Google would be able to increase enterprise demand and thus ultimately revenues.



3 Market Analysis

3.1 Market Segments and Size

Based on the functionality currently offered by Google Apps for Your Domain, we concentrate our analysis mainly on the following segments of the software market:

- Enterprise E-mail (covered by GMail)
- Instant Messaging (covered by Google Talk)
- Web-based Collaboration (covered by Google Talk, Calendar, Start Page)

Google is currently considering including additional products with this suite later. These products include:

- Docs & Spreadsheet (word processing, spreadsheet)
- JotSpot (wikis)
- Blogger (blogs)
- Groups (discussion forum)

Most of these additional features are also covered by the categories above. For instance, the main differentiating factor for Docs & Spreadsheet is certainly the easy collaborative authoring enabled by the product.

We focus our market analysis mainly on the functionality of the relevant products. We think that the delivery model (hosted software, installed software, appliance, etc.) is a secondary dimension in the customer decision process.

3.1.1 Enterprise E-mail

Enterprise e-mail provides messaging capabilities for large organizations. The products in this sector cover both internal messaging, often based on a proprietary protocol, and external messaging, typically based on open Internet protocols.

The market for enterprise (corporate) e-mail currently covers around 400 million seats (Radicati Group, 2006). Of these, more than 250 million are used by large companies with over 1000 employees. The total number of seats is expected to grow to 456 million in 2009.

The revenues generated in this sector of the software market are currently \$2,510 million (Radicati Group, 2006). This figure is expected to grow to \$3,300 million in 2009.

The competitive situation in the enterprise e-mail market is quite concentrated: Over 90% of revenues are generated by the top three players: Microsoft, IBM, and on a much smaller scale, Novell.

There are some competitors on the low end of the market, often using alternative pricing or delivery models. This group includes companies such as Mirapoint, which makes e-mail appliances, and Zimbra, which offers an open-source-based messaging suite. However, these companies have a very small market share. For example, Mirapoint has annual revenues of only \$50 million (Gartner Group, 2006).

3.1.2 Instant Messaging

Instant messaging software (IM) provides real-time communication through immediately delivered text messages. Modern IM clients typically also offer audio communications via Voice over IP.

Enterprise-class IM is still a fairly undeveloped market. More than 80% of enterprise IM users still use a consumer IM client, such as MSN Messenger or Yahoo Messenger (Frost & Sullivan, 2006a). However, there are some niche vendors that offer secure IM and other specialized solutions.

The revenues generated in the enterprise IM market are still relatively small with \$386 million in the North-American market (2006). This sector is expected to grow quite rapidly to \$1,124 million in 2012.

3.1.3 Web-based Collaboration

Web-based collaboration covers a broad range of technologies that enable users and distributed teams to work collaboratively over long distances, using the Internet as a transport medium. Product classes in this sector include synchronous and asynchronous technologies such as web conferencing, collaborative authoring (e.g. wikis, blogs), and web-based document sharing. Since web-based collaboration is a new and still emerging field, its definition is not very stable yet.

However, according to market studies, the market for web-based collaboration products and services generated revenues of \$931 million in 2006 and is expected to grow to \$2,644 million in 2010 (Frost & Sullivan, 2006b).

3.2 Competitors

3.2.1 Microsoft

Microsoft is clearly the most dominant competitor in the relevant segments of the software market. It is the only company next to IBM that can offer a full range of products for all segments discussed here.

In the enterprise e-mail server market, Microsoft is the clear market leader with its current product Microsoft Exchange 2003 SP2. The new version, Exchange 2007, is expected to be released soon. In the North-American market, Microsoft's market share is currently 42% (Frost & Sullivan, 2006a). Microsoft is also clearly dominant in the e-mail client market with Outlook, part of the ubiquitous Microsoft Office suite.

In instant messaging, Microsoft has a strong consumer offering with MSN Messenger (now called Windows Live Messenger) and also an enterprise-level product with Windows Live Communications Server. Microsoft currently has a 28% market share in the enterprise IM space (Frost & Sullivan, 2006a).

Finally, in web-based collaboration, Microsoft has several products. The most important is certainly SharePoint Server 2007, a product that covers enterprise search, document management, and information sharing. SharePoint is also available in a simpler version (Windows SharePoint Services) as a free add-on to Windows Server. A big strength of SharePoint is its strong integration with the Microsoft Office suite. However, since the product is very complex, it is not very easy to roll out in large organizations. Another product, Microsoft Live Groove, is a client-installed collaboration product that enables shared workspaces, information sharing and conferencing. It does not require a server and is available on a subscription basis.

Microsoft is planning to serve the SMB market with Office Live. This fully hosted product offers e-mail functionality, information sharing, web site management and some basic CRM and accounting functionality. Office Live is available on a subscription basis.

Strengths	Weaknesses
<ul style="list-style-type: none"> • Broadest product range • Strong integration between products • Positive effects from desktop dominance (Windows, Office) 	<ul style="list-style-type: none"> • Full feature set only available when using latest versions of Microsoft products exclusively • Expensive maintenance • Needs a lot of training

3.2.2 IBM

With a market share of 35%, IBM's Lotus Notes/Domino product suite is the second-strongest player in the enterprise e-mail market. As part of the suite, IBM offers the Lotus Sametime IM client, which has a market share of 33% in the enterprise IM market. The Lotus product range integrates particularly well with IBM's other enterprise software products, such as IBM WebSphere Portal.

Under the IBM Workplace strategy, IBM offers a number of vertical collaboration solutions for specific industries or corporate functions. IBM Workplace Services Express is a product that offers entry-level collaboration functionality to small-to-medium-size businesses or departments.

IBM's product strategy is complex and does not always seem to be very consistent. For instance, there are several features that are available in several of IBM's distinct product lines.

Strengths	Weaknesses
<ul style="list-style-type: none"> • Broad product offering • Vertical solutions • Strongest off-line capabilities 	<ul style="list-style-type: none"> • Very complicated, not fully integrated product offering • Very complicated pricing • User interface, including web access, generally seen as not state-of-the-art

3.2.3 Novell

Novell's GroupWise e-mail product still has a market share of 13% and is therefore number three in the market but still bigger than all smaller players combined (with 10%). Novell is positioning its GroupWise 7 product as a more cost-effective and open alternative to Microsoft Exchange.

Based on GroupWise, Novell also offers IM and workgroup collaboration functionality. Its marketing strategy focuses on openness and low cost. Novell also integrates several open source products into its offering, including the web-based mail and calendaring product "Hula".

Strengths	Weaknesses
<ul style="list-style-type: none"> • Strong commitment to open standards • Clear pricing structure 	<ul style="list-style-type: none"> • Doesn't cover all areas of functionality • Expensive for smaller deployments • Limited credibility, strategy not really clear

3.2.4 Mirapoint

According to its web site, Mirapoint Inc. has a user base of 100 million inboxes, which would make it number two in terms of e-mail seats behind Microsoft. However, with revenues of approx. \$50 million (Gartner Group, 2006), the company is quite small. The explanation for this is the very low price point per seat that Mirapoint is able to offer based on its business model.

Mirapoint sells messaging appliances that bundle hardware with messaging and security software. Its entry-level product, Message Server M50, provides a complete e-mail solution for companies with between 100 and 500 users. The basic appliance with 50 user licenses

costs around \$14,000, and additional web-mail users can be added for as little as \$12.90 (compared to \$67 per Microsoft Exchange user). This big cost advantage has enabled Mirapoint to gain market share in the ISP, educational, and government market. Also big corporations such as Ford, Mitsubishi Motors or Illinois Tool Works are Mirapoint customers.

According to a study by the Radicati Group (Radicati Group, 2004), a Mirapoint deployment has a very strong TCO advantage over Microsoft Exchange, since not only capital expenditures are lower, but maintenance is far simpler due to Mirapoint's all-in-one appliance model.

Strengths	Weaknesses
<ul style="list-style-type: none">• Lowest TCO, according to industry analysts• Easy deployment due to appliance model• Based on open standards	<ul style="list-style-type: none">• Limited functionality• Integration issues• Small vendor with limited credibility in the enterprise space

3.3 Pricing

Pricing for the big vendors' product suits is quite opaque. The price level depends on the product version, on the size of the company, on the product range that a customer buys, on the type of licensing agreement, and on server capacity. In addition to this, vendors are known to give special discounts particularly to big customers.

For instance, Microsoft sells Small Business Server (for companies with less than 50 users) with five client licenses for \$781 (with Software Assurance contract). Additional users cost on average \$98 per seat. Exchange Standard Edition (50-500 users) costs \$699, and every user adds \$67. Finally, the unlimited Exchange Enterprise Edition costs \$3,999 with \$67 per user. IBM's pricing is based on the computing power of the server and on the type of client access technology, and Novell only charges an amount per user.

To make the pricing strategies more comparable, we have tried to calculate the pricing for typical scenarios that smaller and medium-sized businesses might encounter. These calculations are based on official list prices for the U.S. market (Microsoft, 2006; IBM, 2006; Novell, 2006; Mirapoint; 2006). A reliable calculation for a bigger enterprise is virtually impossible, since various influence factors and discounts tend to differ widely.

Small business scenario

(messaging, including maintenance contracts)

	5 users	10 users	20 users
Microsoft	\$781	\$1,471	\$2,851
IBM	\$1,936	\$2,441	\$3,451
Novell	\$815	\$1,630	\$3,260

Medium-sized business scenario

(assuming one server, full client license, maintenance contracts, no discounts)

	50 users	100 users	500 users
Microsoft	\$4,049	\$7,399	\$34,199
IBM	\$6,481	\$11,531	\$51,931
Novell	\$8,150	\$16,300	\$81,500
Mirapoint (web-based, incl. hardware)	\$14,800	\$16,156	\$25,480

Quite obviously, the price difference for the top three players is not very big. Although Novell claims to be the most cost-efficient, it is actually the most expensive in most cases, although in a typical real-world case this might be different.

The appliance-based solution by Mirapoint has its break-even point against Microsoft Exchange at slightly more than 230 users and is clearly cheaper for larger deployments. However, these pricing examples cover only capital expenditures and maintenance fees and not total cost of ownership.

3.4 Customer Segments

3.4.1 Company Size

The most typical segmentation for this market is by company size. Figures collected by the Radicati Group (Radicati Group, 2006) show that while large and very large corporations account for more than two thirds of all corporate e-mail seats in 2006, the growth rate for smaller companies is clearly higher. However, in absolute terms, very large enterprises will buy the most new e-mail seats in the years to come.

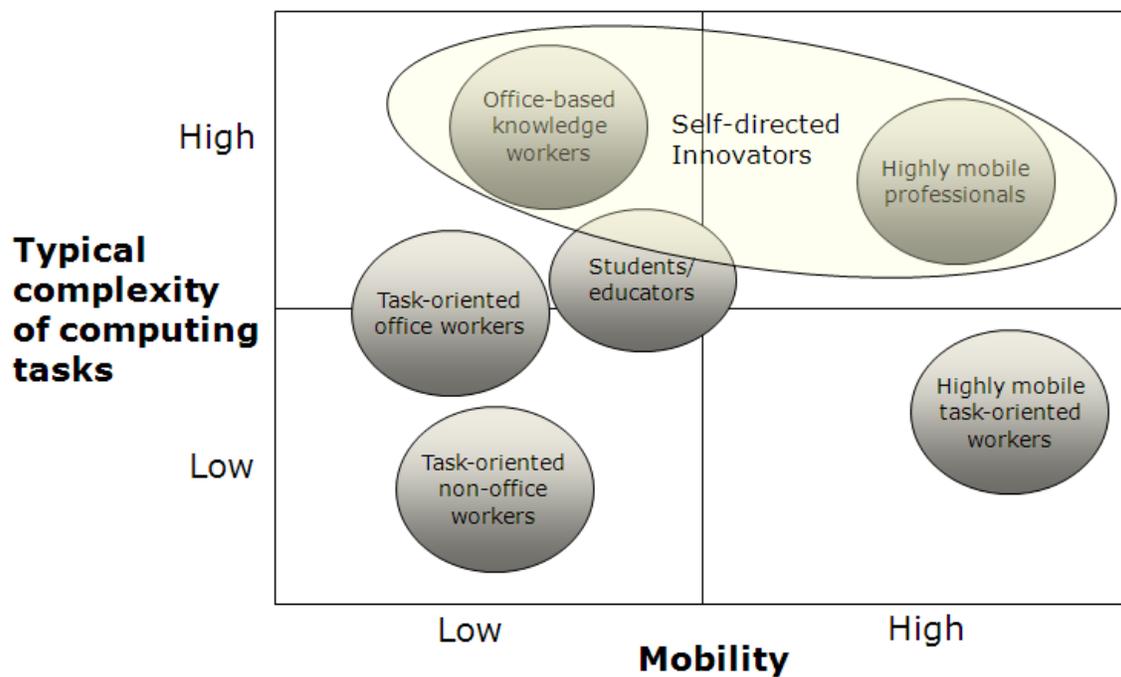
(million seats)	2005	2006	2007	2008	2009	Growth 2005-2009	Growth 05-09 units
Small (1-100 employees)	68	72	80	86	98	44%	30
Share	19%	19%	20%	20%	21%		
Medium (100-1,000 employees)	54	57	60	69	74	37%	20
Share	15%	15%	15%	16%	16%		
Large (1,000-10,000 employees)	96	102	104	112	116	21%	20
Share	27%	27%	26%	26%	25%		
Very large (10,000+ employees)	139	147	156	164	177	27%	38
Share	39%	39%	39%	38%	38%		
Total	357	378	400	431	465	30%	108

3.4.2 End User Type

An alternative perspective on customer segmentation is the type of end user that actually uses the product. Most large companies have very different types of job roles and work environments. For instance, the computing needs of a member in the strategy department are fundamentally different from those of a clerical employee or a factory worker. These very different types of users exist in the same company and same industry however.

To approach the already quite mature market in a more creative way, it could therefore be interesting to address the specific needs of these different user types. Companies nowadays wish to communicate with every employee by e-mail and intranet, but in many cases it isn't cost-justifiable to buy full Microsoft Exchange or Lotus Notes licenses for every employee. Web-based options for the established products are often hard to use and not always much cheaper.

We therefore created the following end user-type matrix that uses the complexity of computing needs and the need for mobility to cluster end users:

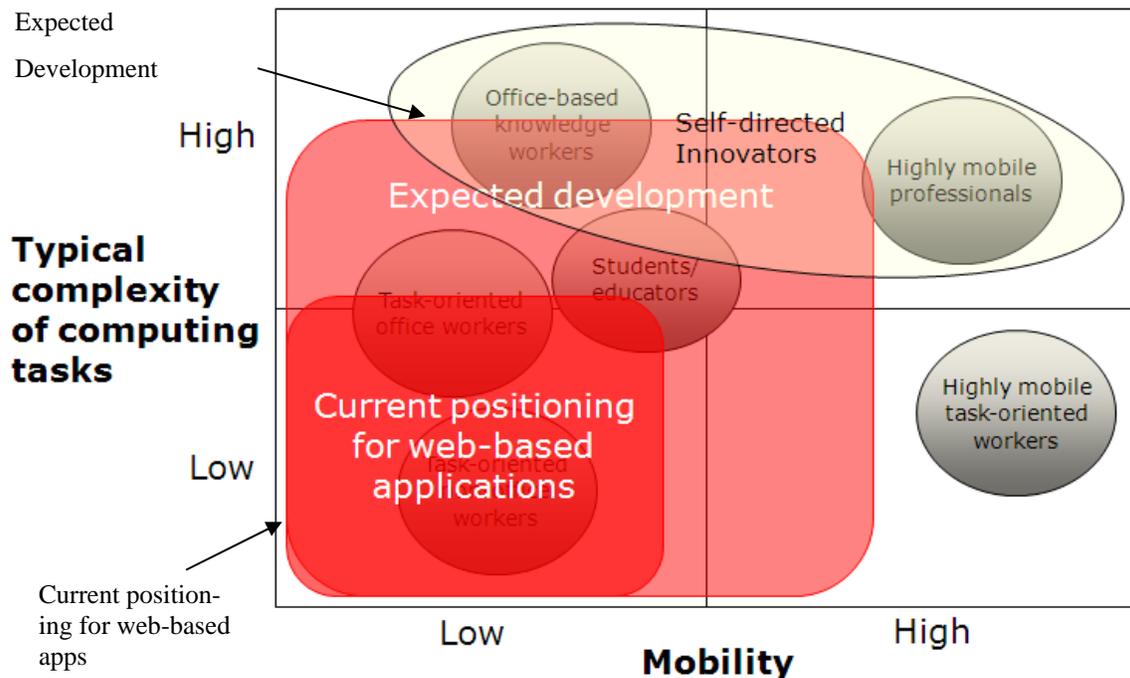


Google's main target group, the self-directed innovators, comes in two variations: There are highly mobile professionals that spend much of their time traveling and therefore need strong offline capabilities (for instance, to work on an airplane). Office-based knowledge workers have less need for mobility, since they spend most of their time in an office with fixed broadband infrastructure.

Highly mobile task-oriented workers, such as field service technicians or logistics staff, have less complex computing needs but a very high need for mobility. On the other hand, task-oriented office workers have little need for mobility and computing needs of medium complexity. These people often spend most of their day on a computer, but frequently using only one task-focused application. Finally, task-oriented non-office workers, for instance factory workers or front-line service personnel, typically use little IT functionality.

When compared to the leading products in the e-mail, IM, and collaboration space, web-based products such as Google Apps still have some limitations. Web-based software can only be used while connected to the Internet with a broadband connection. This obviously limits mobility, since offline use is currently not a viable option.

In addition to this, web-based messaging and calendar solutions do not yet offer the same kind of advanced enterprise-level capabilities that people know from Microsoft Exchange or Lotus Notes. For instance, advanced enterprise-level meeting scheduling is not easily available on web-based products. Furthermore, the high-level rich text editing capabilities that PC-based client software offers is not possible on the same level even in the latest AJAX-based web clients.



We therefore believe that the current generation of web-based applications covers a part of the market that has low-complexity computing needs and low mobility. This is of course not the same for every product category. For instance, collaboration using web-based products is probably already almost as effective as client-based solutions.

It is also obvious that web-based applications will evolve to cover more of the total market over time. Just the developments of the last 12 months have already opened several new target markets for web-based applications, but in the high-end segment of the market, the difference in functionality is still big.

However, web-based products clearly have a huge advantage in terms of simplicity (lower training costs) and smaller need for infrastructure (lower costs for deployment, immediate availability). These factors should be used to position a product against the incumbent vendors.

3.5 Partners / Complementors

All established vendors use partner companies to deploy their products. Service partners, typically system integrators or value added resellers (VARs) install and configure the product in an optimized way for the specific customer situation. They also integrate the products with other parts of the IT infrastructure. This is particularly important for user management (connection to directory servers etc.) and content exchange.

Independent software vendors (ISVs) make software products that complement a software platform and add functionality. Examples include anti-virus software, archiving and backup, or specialized vertical solutions.

Both IBM and Microsoft have huge partner networks with hundreds of certified partner companies worldwide that offer services and add-on products for a broad variety of market segments (Microsoft, 2006; IBM, 2006). These companies not only add value to the product itself but also serve as a major sales channel.

The availability of a partner network is often a major factor for a customer's product decision in the enterprise space. Big companies rely on system integrators to help them deploy and maintain a complex system, and therefore the availability of major partners is a precondition for success in the enterprise market

In order to match the incumbents' partner networks and third-party offerings, Google needs the following:

- A network of system integration partners of various sizes in various geographies. Google has already built such a network for the Google Enterprise Search product and should extend this network further.
- Some of the top-tier system integrators (such as Accenture, HP, EDS, CSC, maybe even IBM) as partners. A commitment of this kind of firm is a strong signal to the market. So far, Google only has BearingPoint as a partner in this top-tier group.

- A network of independent software vendors and other third-party developers that add value to the platform. Google is already building a developer community around the OneBox concept and should extend this activity further.
- A credible migration strategy for customers that want to migrate their existing messaging systems to Google's products.
- A responsive in-house professional services group that can support partner companies when tough problems arise.

4 Delivery Models

4.1 Software as a Service (SaaS)

Software as a Service would allow Google to provide its enterprise customers with a fully hosted solution, much like what Google has done for Internet users with Gmail, Google Docs and Spreadsheets, and other Google online applications.

This approach would be equivalent to the planned Google Apps for Enterprise product and is discussed here for reference.

Advantages to Google:

- Leverages existing Google technology and infrastructure. The company has proven itself to be one of the leaders in building highly scalable, reliable, efficient, and easy-to-use online applications. Furthermore, Google's numerous datacenters already provide the infrastructure for deploying web-based applications.
- Leverages existing Google applications. Improvements to these existing applications would likely benefit the enterprise version.
- Exhibits economies of scale.
- High margins and recurring revenue. Google encounters extremely low marginal costs in setting up new accounts, and pricing for SaaS typically utilizes a subscription model.
- Low cost of support and maintenance. Since all of the software code and data resides with Google, it is much easier to diagnose and resolve potential issues. Fixes to the application can be propagated to production servers instantly without requiring client interaction.

Customer Value

- Low IT and infrastructure costs. Because SaaS is a fully hosted solution, customers do not incur any IT costs that would be traditionally associated with self-hosted applications, such as maintenance of internal servers. This is extremely favorable for smaller companies that do not have a large IT budget, since Google could potentially take care of most IT needs.
- Lowest entry costs and rapid deployment. The SaaS pricing model makes enterprise applications affordable for smaller companies. Instant and automated account setup gives customers quick access to business applications.

- High reliability. In some cases, Google's datacenter reliability may even be greater than a company's own servers, since Google's infrastructure offers a layer of redundancy.

Disadvantages and Challenges

SaaS, being an emerging distribution model, has many challenges to overcome. The key disadvantages and challenges are summarized here, but are discussed more thoroughly in the following section.

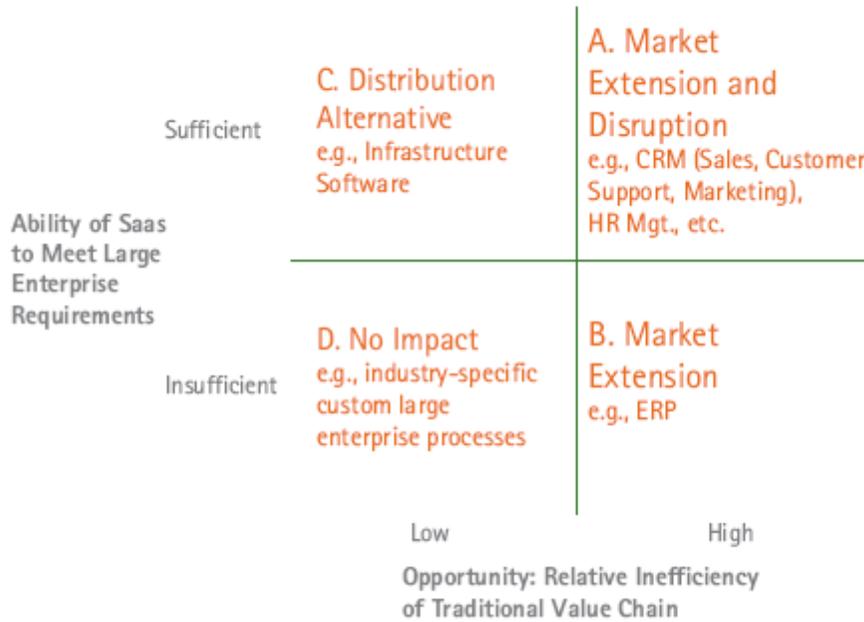
- Security and privacy concerns. As all customer data must also be stored on Google's servers, customers with sensitive data may be hesitant to trust Google with this data. Many large enterprises require full control over company data at all time.
- Applications unable to meet requirements. Currently, web-based applications are limited in functionality and do not provide the rich interface that a full desktop or thin-client application could offer. Furthermore, these web-based applications are constrained by browser technology. While Google Docs could be good enough for consumers, the AJAX-driven application cannot compete with Microsoft Word in functionality and experience.
- Hosted applications require Internet access. There currently is no technology that enables offline use of these hosted applications. This could be inconvenient for those who travel frequently, as internet access could be unavailable in certain places, such as remote locations or on airplanes.
- Difficult to integrate with other applications. SaaS applications may offer little or no integration with other applications, especially with existing applications that are hosted behind the corporate firewall. This is a barrier to adoption by larger companies that have an existing IT infrastructure.
- Multi-tenant shared architecture could bring down service. Because Google datacenters could be targets of Internet attacks, such as DDOS, a service outage during critical business hours could have devastating financial consequences for customers.

Will Enterprises Adopt SaaS?

The question is should Google go with SaaS or appliance as its enterprise distribution model? From the standpoint of Google's expertise and technology, it would seem that the obvious choice is SaaS. However, SaaS is an emerging technology and raises many concerns with enterprises.

As an enterprise increases in size, the complexity in its requirements and business processes also increase. Since SaaS applications lack customization and support for very complex

functionality, SaaS may not be a good fit with medium and large enterprises. Over time, vendors can increase the functionality in their applications. However, according to a Gartner report in 2005, less than 10 percent of users will use an on-demand service through 2010 (Gartner, 2005).



“The opportunity for SaaS depends on the relative inefficiency of on-premise alternatives. In other words, the greater the share of resources and time devoted to downstream activities (such as installation, configuration and maintenance...), the more attractive SaaS will be.” (Accenture, 2005)

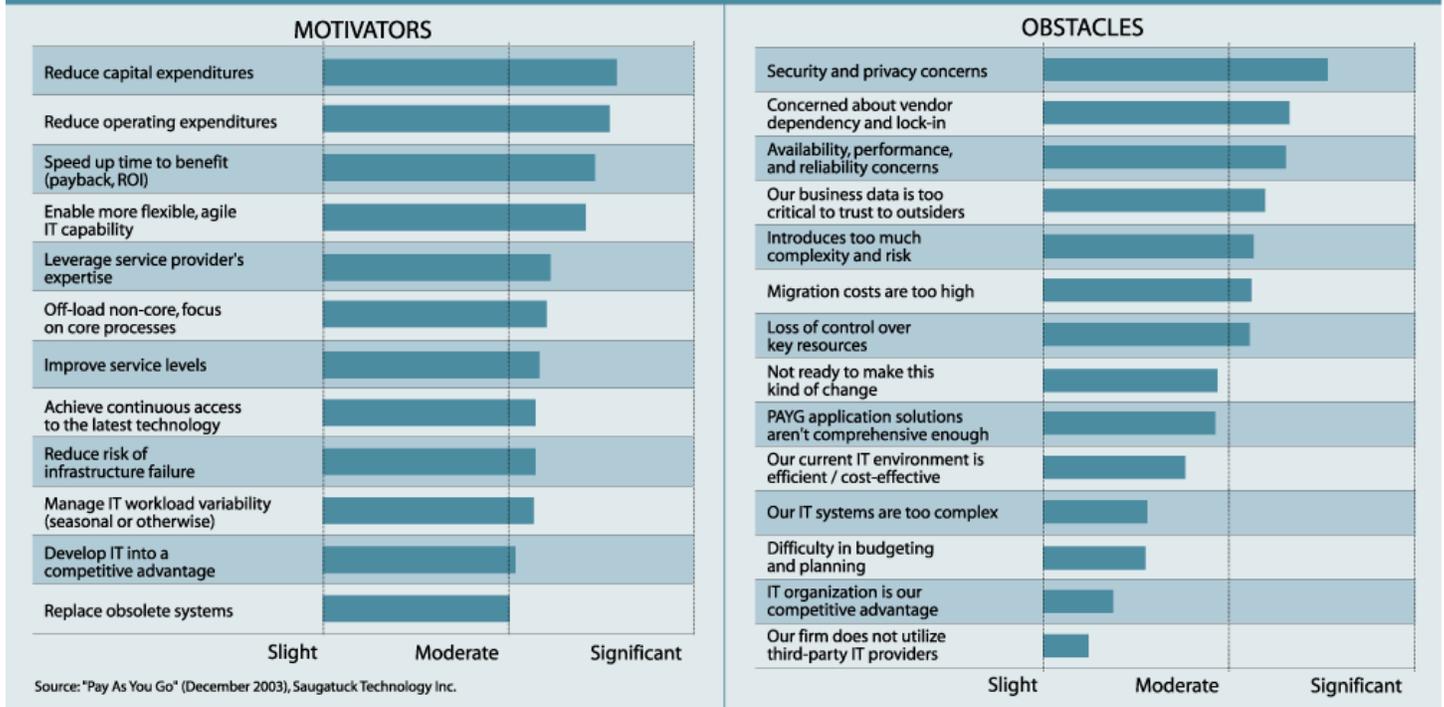
Source: Accenture

Another barrier to enterprise adoption of SaaS exists in enterprises that already have an established IT infrastructure. Because most medium and large enterprises have made significant investments in enterprise software solutions that tailor to their business needs, it would be extremely difficult for a new SaaS offering to find a place within this tightly integrated environment. According to an Accenture whitepaper, “SaaS wins its deals when customers must replace existing solutions for internal reasons, such as a merger, the redesign of processes or the obsolescence of their existing solutions. As a result, the overall revenue impact of SaaS on the enterprise software remains modest.” (Accenture, 2005)

Lastly, enterprises are highly concerned about security and privacy. In a study of SaaS adoption by Saugatuck Technology, which surveyed over 300 businesses, security and privacy topped the list of significant concerns with outsourced services (Saugatuck, 2003). According to Chris Swenson, a software research director at NPD, most companies will not give up control of e-mail or calendars if they can afford to run them internally. Instead, those who will are small groups such as non-profits, schools, and churches, which cannot afford in-house solutions (Garrett, 2006).

Outsourcing Motivators and Obstacles

In a survey of more than 300 businesses, Saugatuck Technology asked which concerns were significant motivators and obstacles to outsourcing. Respondents rated each item on a scale of 1 (not a motivator/obstacle) through 5 (critical motivator/obstacle). The bar



While it seems that SaaS has an uphill battle to get into enterprises, companies do recognize that the service model is here to stay and are waiting to see how the industry evolves. The Gartner Group recommended in its 2005 report on the adoption of SaaS that “enterprises should recognize that SAAS is moving out of the early-adopter phase and is fast becoming a more viable alternative for different types of application requirements. As SaaS applications improve and more companies begin testing the waters, acceptance should progress, although it will take time for companies to accept these hosted applications (Gartner, 2005).”

4.2 Hardware/Software Appliance

Appliances combine proprietary software with commodity server hardware as a sealed appliance. Due to the typical form factor of the servers used for appliance deployments, this model is sometimes referred to as the “pizza box model”. Customers purchase the appliance, add network and power connections, configure the appliance, and then the appliance does its magic and adds its functionality to the network.

Advantages to Google (versus SaaS)

- Behind the corporate firewall. Having Google technology behind the firewall means IT administrators can keep all corporate data secure and have full control of architecture and interactions.
- Integration with corporate intranet. Because the server may be able to access other servers behind the firewall, Google can offer integration with other business applications and servers.

Customer Value

- Self-contained, plug-and-play dedicated server. Having the entire appliance self-contained means that IT administrators only need to worry about configuring the appliance's functionality and not worry about maintaining the underlying software for the appliance.
- Potentially scalable. Google could design the appliance such that additional capacity could simply be added in the form of chaining multiple appliances together.
- Lower total cost of ownership. Independent of the specific business model, appliances tend to have lower maintenance costs, leading to lower overall TCO.

Disadvantages and Challenges

- Setup and maintenance costs can vary. Depending on the business model chosen, the appliance model could require knowledgeable IT staff for maintenance and infrastructure that the appliance can plug into. Integration with other applications may incur high costs.
- Appliance development is not Google's specialty, although there is some previous experience with the Google Search Appliance. Developing for appliances can be considerably different from developing applications for highly scalable and powerful web farms.
 - Does not leverage existing Google applications. Existing Google apps, such as Docs and Spreadsheets, must be ported and optimized to run on one server instead of many, which may require considerable architectural changes.
 - Follows traditional software development model. Unlike Google's own hosted applications, in which changes can be propagated to all servers instantly, appliance development requires significant testing for each release, with changes constrained by IT administrators approving and installing patches.

- Constrained by hardware upgrade cycles. Once an appliance is purchased, customers expect to be able to use that appliance for multiple years. This constrains development to be compatible with the hardware that was used and makes it difficult to introduce new functionality.
- Competitive environment. Appliances and server software is a very competitive market (see market analysis above). Since Google loses a significant amount of technology advantages by developing for appliances, producing an appliance solution may bring limited success if more experienced competitors have superior offerings.

4.3 Virtual Appliance

Virtual appliances are a hybrid between a fully sealed hardware appliance and packaged software. Instead of selling customers physical equipment with software, a virtual appliance distribution model fully virtualizes the server hardware that would otherwise be used in a hardware appliance. Customers would receive a disk image, which would then run on a virtualization layer and thus create a virtual appliance.

Advantages to Google

- Highly scalable and high performance. Server power expands with processing power allocated to the virtual machine. Virtualization technology allows one virtualized server to utilize the capacity of multiple servers, emulating a server farm.
- Low cost of distribution. Because hardware costs have been removed, Google can enjoy low marginal costs of distributing virtual appliances. This could also allow Google to explore other pricing models, such as an advertising-based revenue model.
- Not constrained by traditional software development model and hardware cycles. Because virtual appliances are fully contained in a disk image, updates to the virtual image require only the updated image to replace the old image. Furthermore, there are no fixed hardware constraints, since the hardware running the software is virtualized.
- Potential for ISV partnerships. Google could partner with ISVs to produce customized versions of the virtual appliance, allowing greater market reach and depth of functionality.

Customer Value

- Leverages existing IT infrastructure. As with hardware appliances, virtual appliances also sit behind the firewall, allowing potential integration with other applications and services. In addition, companies with robust redundancy systems can easily backup

the data that is stored by the virtual appliance and the virtual appliance itself, as all are simply files residing on disk.

- Leverages unused server capacity. Since customers now supply the hardware that the appliance runs on, companies can leverage unused server capacity to power the virtual appliance. This also exhibits economies of scale, where companies can have many servers pooled to run multiple applications and virtual appliances.

Disadvantages and Challenges

- Performance dependent on underlying hardware. If a customer uses unreliable server hardware or has a poorly designed IT infrastructure, the virtual appliance may also become unreliable. Frustrated customers may pin the blame on Google instead of their own equipment.
- Easy to transfer files leads to piracy. Because virtual appliances are files that can easily be copied, companies may run unlicensed virtual appliances. There also exists the slight possibility of reverse engineering attempts on the technology.

4.4 Packaged Software

This is the traditional packaged software distribution model in place for most of the software market today. Application software can offer the richest user experience, functionality, and customizability. The industry and market size are huge. However, competition is very big, with established players such as Microsoft. Packaged software is not Google's specialty, and the model in general clashes with Google's culture and competitive advantages. Therefore, analysis of this model is provided here for completeness.

Advantages to Google

- Richness of application (installed server software, desktop software). Desktop software can offer the best user experience, leveraging the computer's hardware, operating system, and graphics system for high performance, functionality, and usability. Installed server software can often be more easily integrated with other applications.
- Attractive margins. Traditional software licensing models typically have the most attractive gross margins and, depending on the model, can generate some recurring revenue based on maintenance fees.

Customer Value

- Application customizability. Packaged software can typically be extended with add-on modules or third-party applications that leverage software APIs.
- High performance and availability. Desktop software uses local computer resources, so load is not concentrated on a few servers. Furthermore, desktop software can be used offline and even while detached from the corporate network.

Disadvantages

- High development and testing costs. Traditional packaged software takes a significant amount of resources and time to develop. In addition, separate versions need to be developed and extensively tested depending on the host platform.
- Not Google's expertise. Aside from a few specialty applications, such as Google Earth and Desktop Search, Google does not develop packaged software.
- Highly competitive market. Companies such as Microsoft have been making packaged software since the beginning of the software industry. These companies have significant code libraries and refined development processes which create significant barriers to entry. Furthermore, these companies tend to have full packaged software suites, in which each piece of the suite complements other pieces and increases the value of the bundle as a whole. Thus, customers incur high switching costs to include another company's product.
- Piracy. Packaged software incurs extremely high rates of piracy, which may translate to lost potential revenue, especially in other countries.

4.5 Summary

The following table summarizes the advantages and disadvantages of the different model from a user perspective:

	Incumbents (MS, IBM)	Google Apps hosted	Google Apps appliance	Google Apps virtual appliance	Google Apps installed software
Collaboration functionality	0	+	+	+	+
Messaging/ calendaring functionality	+++	+	+	+	+
Availability, reliability	++	0	+	++	++
Control, security, confidentiality	+++	--	-	+	++
Low TCO	---	+++	++	+	-
Flexibility and fast deployment	--	+++	+	+	--
Open standards	-	+	+	+	+
Integration with rest of enterprise	++	---	--	--	+
Simplified pricing	---	++	++	+	0

Overall, there is no single best deployment model. However, based on the discussion above, we think that both the hardware appliance and virtual appliance models are the most promising for a behind-the-firewall deployment for Google Apps.

5 Business Models

In evaluating the applicability of Google Apps for the Enterprise, we evaluated several different business models. We will highlight these different models, as well as look at the specific advantages and disadvantages of each.

5.1 Advertising Model

Over 98% of Google's existing revenue is generated via advertising, using either Google AdWords or the AdSense network of partners. It is therefore logical to look at this model first for Google Apps for the Enterprise. In this model, product advertisers would reserve screen space in the banner or margins of the search page or the margins of the application. Based upon the results of queries, a percentage of users will choose to click on the advertising links; each "click" generating \$.20 or more of revenue for Google (depending upon whether the advertisement is provided directly by a Google customer using AdWords or a Google channel partner using the AdSense network offering). For end users, the Apps would be subsidized by this revenue stream, so end user and enterprise fees would be \$0.

The assumption that we make is that the Google Apps for Enterprise can have ads embedded in the look and feel (LAF) of the applications without dramatically affecting their functionality. If this were not the case, it would be difficult to see where advertising based applications would be feasible without a significant re-design of the Google Apps.

Advantages of the Advertising Model

The principle advantages of advertising as a business model for this project are (1) that Google Apps will use the same revenue generation means as the rest of the company, (2) that revenue is generated over the lifetime of the use of the application, and (3) Google will be able to "convert" a large percentage of traditional consumer advertisers into a sponsorship basis for this new offering. This model empowers Google to utilize the "Long Tail" in revenue collection and generate considerable sums aggregated over a wide number of searches or information retrievals using the Apps. In contrast to models such as software licensing, this is a powerful strategy for avoiding the boom and bust cycle of software license purchase negotiations and also a way of reducing the sales cycles for incremental revenue generation.

Disadvantages of the Advertising Model

Web based advertising, though accepted in the consumer internet world, has yet to see success in the enterprise. CIO's and CEO's of target companies most likely will have concerns about (1) security due to the network "chattiness" of advertising links and (2) reduced productivity of employees, as a result of the distraction of advertising while in the midst of work. The latter is a particularly fatal flaw in the use of advertising for enterprise applications. As a result of being distracted by banners and links surrounding an application, an information worker might reduce his productivity, or even worse make errors. Whether it

is through reduction in productivity or increases in errors, an advertising-based revenue model is potentially a dead end with enterprises.

An advertising model also does not address one of the core strategic weaknesses of Google – lack of guaranteed recurring revenue. Since Google’s advertising contracts are not long term binding contracts, a customer can cancel with less than 30 days notice. Should there be a substantial downturn in small or large business advertising, it is possible that Google’s revenue stream would be threatened.

5.2 License Model

In the license model, the enterprise would pay a one-time license fee for a perpetual right to use Google Apps. To supplement the initial license revenues, customers would pay 15% of the license fee per annum for technical support and updates. The license would be paid either on a per seat/user bases, or as will be discussed below, potentially on a per-site basis.

Advantages of the License Model

The license model generates revenue in significant “chunks”; for productivity applications this could be in the hundreds or thousands of dollars per seat. For large enterprises, software licensing deals can reach multiple millions of dollars. These large purchases can single-handedly help a public company to meet or exceed its quarterly number, generating additional billions in market capitalization. In addition to the initial purchase, the license model also creates a predictable revenue stream in the form of the 15% maintenance fee; this also goes almost entirely to the bottom line and would insulate Google from the vagaries of the advertising-based model.

Disadvantages of the License Model

One of the downsides of the license model is the amount of time necessary to negotiate a license. During the rise of client server applications and well into the Internet Bubble, software license negotiations generally took 6 months or less¹. Since 2001, the time to negotiate and receive customer approval for a software license proposal has ballooned, in certain cases to over a year. This length in negotiation time has a serious side effect for vendors; it is difficult to predict if/when/for how much a software license agreement will be completed, and often the decision timeframe is too long to positively affect the operating results of the vendor.

In addition, CIO’s have started to defer to centralized purchasing departments for software licenses. Purchasing officers have themselves subsequently learned that vendors of information goods tend to discount heavily at the end of the quarter, since the discount is being applied to the 80% or higher margin that information goods generate. Therefore, by

¹ Team Analysis

waiting until the last several days of the fiscal quarter of the vendor, enterprises have learned that they can generate huge savings.

A license model would expose Google to this decision cycle and the resultant swings in/out of profitability based on the level of discounting. A potential method of addressing the implications of a license model is through a form of economic bundling such as site licensing. In the case of the site license, the customer would make an estimate of use and pay a capped fee that provides for all users of the application at that “site” (generally defined to be a single geographic location, division, or occasionally for an entire enterprise). By providing Google Apps in a site license-only model, it is possible the recurring maintenance benefits of license sales can be achieved without the up/down of software license sales.

5.3 Subscription Model

The software subscription model can best be described as renting. With no upfront fee, enterprise customers commit to a period for the right to use an application for a certain number of seats. A common length of a subscription is three years (Salesforce.com, 2005). The subscription model is often used hand in hand with SaaS, as the subscription term can be most accurately measured if the application is hosted by the vendor, rather than tracking software installed at the customer site.

Advantages of the Subscription Model

One of the major advantages of the subscription model is predictability. Once a subscription is signed, the vendor company can be relatively sure of where and when future revenue will be generated. The subscription method creates the type of forward visibility that appeals to both shareholders and market analysts alike. In addition, subscriptions take away the incentive to discount by the vendor; the wild frenzy of enterprise software discounting at the end of the fiscal quarter is replaced by calmer, more long-term thinking and behavior. For Google, this solves the strategic concern around having predictable, recurring revenue, while avoiding the downsides of enterprise software licensing.

Disadvantages of the Subscription Model

Despite the consistency of the subscription revenue stream, one of the major flaws of this model is renewals. If a customer chooses not to renew at the end of the term or exercises a termination clause in the subscription (for example, tied to system uptime), the vendor has little leverage. The fundamental flaw, therefore, is lack of “stickiness.” Whether it is through dissatisfaction or the emergence of a newer, better vendor, the subscription model does give the power to switch. The onus, therefore, for Google in this scenario would be to deliver a consistently good user experience, as well as superior underlying systems management.

5.4 Usage-Based

The premise underlying usage-based pricing is that the end user reduces risk by not paying an upfront fee, while at the same time not committing to a long-term subscription. This is truly a “pay as you go” approach to utilizing the Apps.

Advantages of the Usage-Based Model

The advantage to end users and enterprises of this model is the reduction of out-of pocket fees to \$0. This empowers users to the degree to which they can anticipate the level of use of the application.

Disadvantages of the Usage-Based Model

For both users and the vendors, the primary disadvantage of this model is lack of forward visibility of cost for the user and revenue for the vendor. Users will find it difficult to budget the Total Cost of Ownership (TCO) of the Apps; Google would have the additional challenge of having to predict future user revenue based on past behavior. In addition, technical metering and recording the usage of applications would be a difficult endeavor. In order for Google to utilize this method, there would be an impact on the internal Google infrastructure through the requirement to use service control technologies.

5.5 Open Source

A more provocative step for Google would be to jumpstart adoption by providing an open source, introductory version of the Google Apps. A low end installed version could be made available to enterprises to generate interest and receive feedback from potential users as to which features and functions are most desired by the enterprise customer base. Users would be free to modify the functionality of the open source version, provided they release the changes to an open source community managed by Google. The SaaS, hosted version could then be modified to include those new features and support the widest possible user base. Should individual enterprises want proprietary features, this could generate services revenue that would be shared between the Google Enterprise and PSO Business units. Google would then be in a position to harness the collective wisdom and input of a far larger development team than its own as well as be responsive to customer needs. Because Google’s proprietary advantage lies not in the software code of the Apps but the integrated solution, this is an alternative that should be studied in greater depth.

5.6 Conclusion: Subscription model best for Google today; research Open Source

Of the models discussed above, the subscription model appears to be the most logical pricing scheme for Google Apps. The subscription approach creates the predictable recurring

revenue stream that would diversify Google away from too high a reliance on advertising. In addition, the subscription model would enable small to medium-sized enterprises to begin adoption. Potentially, many of these small businesses would evolve into customers for the Google Search Appliance and generate considerable incremental revenue. The open source approach should also be considered, if only as a means of generated enterprise feedback, and as a means of strengthening customer bonds. In the next section, in addition to more specific recommendations, an economic analysis will demonstrate the potential revenue impact of this conclusion.

5.7 Revenue Projection

The market for enterprise e-mail, IM, and web-based collaboration is currently going through a potentially very disruptive phase. However, predictions about adoption rates for web-based solutions and SaaS vary widely. It is therefore very difficult to quantitatively predict the developments in this market for the next few years.

In order to present a scenario as a discussion basis, we nevertheless calculated a revenue projection based on the data available.

5.7.1 Assumptions

We assume the following input factors, based on market data and analyst predictions:

- The number of e-mail boxes in large (1,000-10,000 employees) and very large (10,000+) enterprises will grow from 249 million in 2006 to 310 million in 2010 (Radicati Group, 2006).
- In 2010, 10% of large and very large enterprises will use hosted SaaS solutions for their messaging needs (Gartner, 2005).
- The pricing for outsourced SaaS inboxes with additional services will remain relatively constant between \$6-\$8 per user/per month, depending on customer size.
- For an installed solution, there will basically be two viable business models: A classical software license (upfront fee + 15% maintenance fee annually) and a subscription-based model (a fixed fee per user per month).
- We expect that Google will be able to charge a significant premium over existing competitors when choosing the license model due to better functionality. This would result in a per-user license fee for new seats of approximately \$35. We assume an upgrade cycle of three years for major new versions, resulting in upgrade costs of 60% of the original license price for users.
- In the case of an installed solution (appliance-based) with a subscription-based model, we assume that the subscription fee will be \$4-\$5 per user per month, depending on customer size. There are no publicly available pricing models for this

case yet, but this price point would roughly correspond with existing competitors' TCO situations (Radicati Group, 2004), factoring in Google's superior functionality.

- In terms of market share, we assume that Google will be able to sell 30% of newly deployed SaaS seats in 2010, and will win a 15% total market share for installed solutions. This would mean that Google would be the leading player in the SaaS market and displace Novell as the third-largest player in the market for installed solution. This is a scenario that we think is realistic, given the current competitive situation.

We didn't have any cost data available for these calculations, so we concentrate fully on top line growth opportunities.

5.7.2 Hosted Solution (SaaS)

Based on the assumptions discussed above, we calculated the following projection for the Google Apps for Enterprise hosted solution. These figures are for large and very large enterprises only.

Hosted Solution (SaaS)	2006	2007	2008	2009	2010
Total potential market (seats)	2,490,000	4,792,268	9,223,224	17,751,067	34,163,800
Google market share (new deployments)	0%	5%	15%	23%	30%
Google market share (total SaaS seats)	0%	2%	8%	15%	22%
New seats sold by Google	-	115,113	664,643	1,961,404	4,923,820
Total seats for Google	-	115,113	779,757	2,741,161	7,664,981
Percentage of large enterprises in customer base	0%	20%	25%	30%	35%
Average subscription revenue per user per year	\$ 96.00	\$ 91.20	\$ 90.00	\$ 88.80	\$ 87.60
Total subscription revenue per year	\$ -	\$ 10,498,340	\$ 70,178,117	\$ 243,415,075	\$ 671,452,303

Since Google can fully leverage existing code and infrastructure, this should be a very attractive market segment, although it is not very big in terms of number of seats. The key assumption here is the adoption rate of SaaS-based messaging solutions in big enterprises.

5.7.3 Installed Solution

For an installed solution, we calculated the impact of two different business models. Based on our assumptions about Google's potential market share in this segment, Google should be able to sell 51 million seats by 2010. Given the pricing models discussed above, this would result in revenues of \$2.74 billion for a subscription-based model and \$1.23 billion for a license-based model.

15.567 The Economics of Information · Team Project Paper · Goeldi, Jones, Lo
Google Apps for Enterprise Installed Solution

Installed Solution	2006	2007	2008	2009	2010
Total potential market (seats)	246,510,000	253,668,639	261,035,165	268,615,615	276,416,200
Google market share (total installed seats)	0%	1%	4%	10%	15%
New seats sold by Google	-	2,536,686	7,904,720	18,956,841	22,505,589
Total seats for Google	-	2,536,686	10,441,407	29,398,248	51,903,837
Percentage of large enterprises in customer base	0%	20%	35%	40%	60%

Business models for installed solution

Subscription-based model

Average subscription revenue per user per year	\$ 60.00	\$ 57.60	\$ 55.80	\$ 55.20	\$ 52.80
Total subscription revenue per year	\$ -	\$ 146,113,136	\$ 582,630,489	\$ 1,622,783,282	\$ 2,740,522,573

-- or --

License model (per seat)

Average license price per new seat	\$ 42.72	\$ 41.22	\$ 40.09	\$ 39.71	\$ 38.21
Total license revenue for new seats	\$ -	\$ 104,552,066	\$ 316,884,424	\$ 752,814,080	\$ 859,893,535
Maintenance revenue (15% on installed base)	-	-	15,682,810	63,215,474	176,137,586
Upgrade revenue (3 year version cycle)	-	-	-	62,731,240	190,130,654
Total Revenue	\$ -	\$ 104,552,066	\$ 332,567,234	\$ 878,760,793	\$ 1,226,161,775

This big difference in revenues corresponds to a number of factors:

- For a subscription-based model, customers will expect a much higher level of service, including free upgrades and probably some level of remote system management. In fact, this model is a kind of “behind-the-firewall SaaS” from a customer perspective. This obviously has strong implications on the cost side.
- The license-based model, on the other hand, does not assume free upgrades for major new versions. Assuming an upgrade cycle of three years, the financial results of future upgrades will only be strongly visible after 2010.
- In the license-based model, there will be some opportunities to charge for additional services, but these additional revenue streams are very hard to quantify and therefore not included here. We believe that in a subscription-based model, customers will not be willing to pay additional services fees.

5.7.4 Summary of Revenue Projection

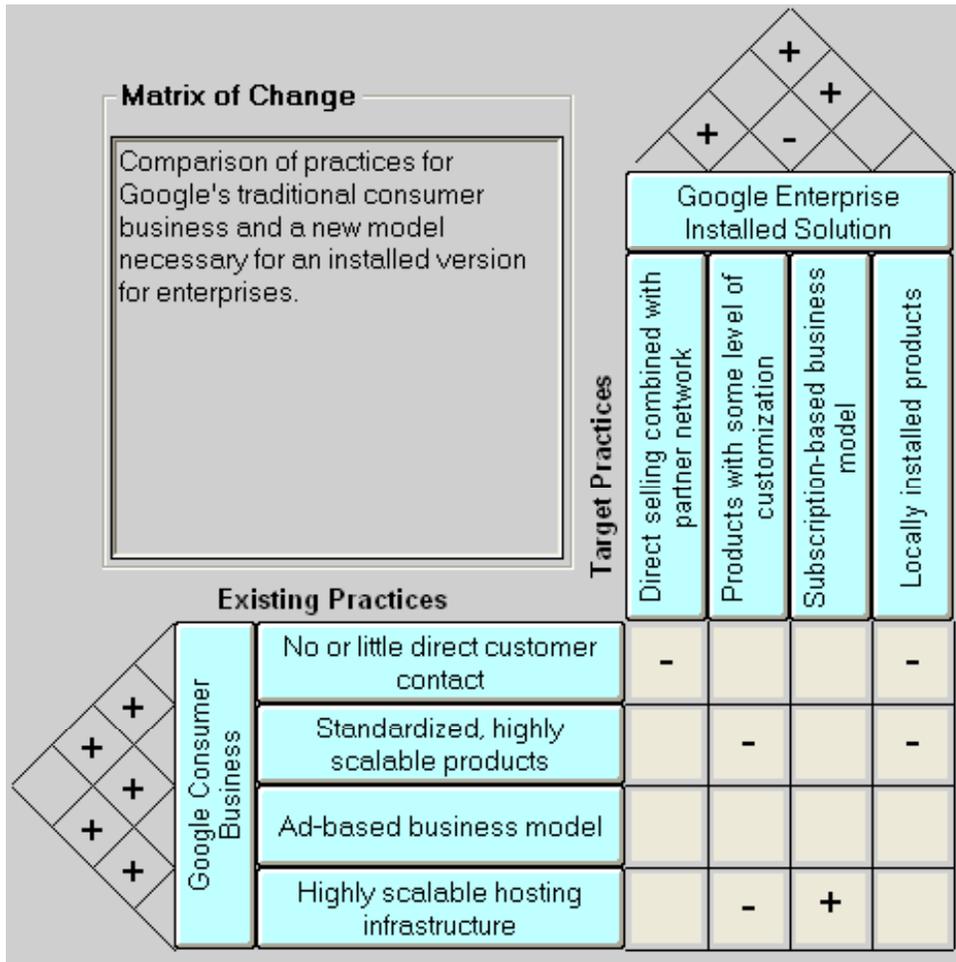
Overall, there is a lot of agreement in most analyst reports that big enterprises will be quite reluctant to adopt SaaS for messaging and collaboration quickly. The reasons have been discussed extensively in this paper.

The comparatively low share of SaaS adopters could still generate an attractive revenue stream for Google, since the company’s position in this market is strong. We also believe that given all synergies with existing offerings, the profitability for this offering will be attractive.

However, the bigger market opportunity in terms of additional revenue is to offer an installed solution of Google Apps for Enterprise. The revenue projection shows that a subscription-based model would be more attractive in terms of revenue growth.

5.8 Necessary Organizational Change

Quite obviously, offering an installed solution for enterprises would be a departure from Google's current business model. We therefore used the "Matrix of Change" (Brynjolfsson and Short, 2006) to analyze the fit with the company's current model.



Both the existing model (Google's consumer-oriented business) and the enterprise model have a lot of mutually reinforcing practices in themselves. However, since the models are very different, there are not many synergies, and there are even practices that are clearly antagonistic.

We therefore think that a move to an installed enterprise solution will not only be a major technical project but also a major organizational challenge. Enterprise customers expect either strong direct support or an extended network of partner companies that can offer services. They also typically want a high degree of customization, although this is not necessarily a key point for messaging and collaboration products. These aspects are particularly strongly opposed to the key principles in Google's current core business.

6 Summary: Recommendations

Given the range of choices and the wealth of corporate resources, it would be quite easy for Google to embark on a massive set of internal changes in order to deploy Google Apps for the Enterprise. It is the opinion of our team that this would be unwise. Despite Google's dominant strategic position in consumer advertising and search, the Company is exposed to more entrenched rivals in the enterprise. The course of action recommended by this team is the following:

- ❑ Do NOT compete with Microsoft or IBM in the traditional installed software market segments with classical license models.
- ❑ Rather, focus on pure hosted SaaS solutions for small-medium sized enterprises
- ❑ Explore appliance models for larger enterprises. These appliances should include:
 - Hardware-appliances for medium-large companies that want easy installation
 - Software/Virtual appliances for large companies that need customizability
- ❑ Utilize standards where possible to ease integration with existing customer infrastructure. This will entail Google taking a stronger role in more enterprise-centric standards bodies.
- ❑ Use subscription-based models to disrupt and co-opt software license based competitors. Using this business model should convert key users to a hosted Google solution and avoid the dilution of resources that would ensue if Google were to take installed software players head on.

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