Google Apps as an Alternative to Microsoft Office in a Multinational Company

The GAPS Project

Thesis presented in order to obtain the Bachelor’s degree HES

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Declaration

This Bachelor's project has been realized in the framework of the final exam of the Geneva School of Business Administration (HEG) in order to obtain the degree of Bachelor of Sciences in Business Information Systems. The student accepts the confidentiality agreement. The author, the Bachelor's project Supervisor, the juror, and the HEG, without compromising their worth, exclude any responsibility concerning the use of the conclusions and recommendations made.

« I declare that I wrote this thesis myself using the referenced sources. »

Geneva, May 31, 2010

Luc Bourquin
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Finally, I would like to thank my family for their patience and for their assistance.
Executive Summary

A large multinational Company is launching the GAPS Project to assess the suitability of Google Apps as an alternative to the current email, collaboration and office toolset. In order to make a decision, the company needs recommendations based on a complete project assessing the Google Apps offering, taking into account the company's specificities.

The company currently uses Microsoft Office with Exchange. Identified problems include the cost of licenses, their dependency on Microsoft, the complex licensing model, and concerns about the use of the current solutions by the contractors.

The GAPS Project describes the steps that the company should follow. In particular, a pilot phase should be conducted with users representing the diversity of the company's users in terms of geographical location and business lines. Success criteria have been defined. They include contractual aspects, business requirements, financial aspects, support, operational aspects, security, and user satisfaction. Pilot results will provide a classification of the company users according to the ability of Google Apps to provide solutions corresponding to their requirements.

Google Apps Premier Edition is a web application suite for businesses. It offers an email storage capacity of 25 GB per user and a Service Level Agreement describing 99.9% uptime guarantee.

Advantages for the company are new business opportunities, such as the real time editing feature and the ability to share a document with an external partner. The messaging service allows the company users to save time, thanks to the large storage capacity and to the well organized mailboxes. The licenses are less expensive than those of Microsoft. Google Apps can be made available to the contractors, as they don't require tools other than a messaging service.

However, advanced users would suffer from the lack of functionality and from compatibility issues, especially when opening Microsoft Office documents with rich content. Frequent travelers and users in locations with unreliable Internet connections would be less productive. Among the disadvantages, we note that a central administration team needs to be created, as the administrative control panel doesn't offer any granularity.
Depending on the potential number of Google Apps users, important savings can be realized as described in the financial analysis, taking into account the costs due to a mixed Google-Microsoft environment.
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Introduction

In the framework of my Bachelor’s degree studies, a large multinational company, the Company, asked me to help them decide whether Google Apps, a set of online services, could replace Microsoft Office for all or for some of its users. The potential changes would touch the heart of the company's information flow processes. Indeed, besides its messaging service, Google Apps includes productivity and collaboration tools. The objective was to ascertain whether the company, with more than 35,000 users, could realize significant benefits.

In order to make a decision, the company needs recommendations based on a complete project assessing the Google Apps offering. The project must take into account the specificities of the company. In this document we present such a project named the GAPS Project, an acronym for Google Apps Premier Starting. My IT instructor experience ensures that the requirements to maintain productivity intact are taken into account.

The first chapter describes the current problems that the company experiences with their current Microsoft solution, and the challenges to resolve them with Google Apps. Chapter 2 describes the organization and the steps of the project, from the elaboration phase to the deployment of Google Apps. The usability of Google Apps is explained in chapter 3, both from the end user and administrator perspectives. Chapter 4, Operational Aspects, includes integration aspects with their current applications and security concerns. A financial comparison, depending on the number of users adopting Google Apps, is made in chapter 5. The last chapter identifies the human factors influencing the success in the deployment of Google Apps.
1. Background

1.1 Company Environment

1.1.1 Company’s Profile

This study is applied to a multinational company with more than 50,000 employees offering services all over the world. The headquarters are located in Geneva, Switzerland. The company requested to stay anonymous in the public version of this thesis.

1.1.2 IT Department Organization

The IT department is headed by the Chief Information Officer (CIO), who reports to the CEO. Figure 1 shows the internal organization of the IT department.

![Figure 1: The IT Department Organization](image)

An IT manager is in charge of the “Infrastructure and Services” and “Contracts and Procurements” sections. He reports to the CIO.

Another IT manager is at the head of the Services section. He is in charge of the Web and collaborative services. This section includes the Internet web site, the intranet services, the messaging service and the standard software image for the computers.

1.1.2.1 The IT global organization

The head of the Information Technology department is based at the headquarters in Geneva. The IT Department provides recommendations and standards to all countries.
In each country, the person in charge of the IT function is the Country IT Manager, who reports to the Country Managing Director. Figure 2 illustrates the IT organization.

**Figure 2**
The IT Global Organization

![](image)

1.1.3 IT Services

1.1.3.1 Messaging and instant messaging

More than 35,000 employees have a mailbox. They use Microsoft Outlook connected to a Microsoft Exchange server (see the section Operational Aspects for more information). 60% of employees use a desktop computer, 40% use a laptop.

1.1.3.2 Office programs

The standard image that employees receive on their computers contains

- Windows XP SP3 Professional
- Internet Explorer 6
- Microsoft Office 2003 Standard SP3
- McAfee antivirus
- SMS Agent

It is a multilanguage image. Countries choose their specific user interface language (eg: French in France). Countries are free to add some specific software on top of the core image.

It is believed that the users are satisfied with Microsoft Office. There are no complaints concerning its functionality.

Internet Explorer 8 is also available and will soon be integrated in the standard image. Compatibility tests with company applications are currently in progress. Microsoft Office
2007 is available, although for the moment, very few computers have this version installed. It is deployed when required. The company skipped Windows Vista and is presently preparing the deployment of Windows 7.

The new image will contain:

- Windows 7
- Internet Explorer 8
- Microsoft Office 2007
- McAfee antivirus
- SCCM Agent

1.1.3.3 Sharepoint

Sharepoint is used for the intranet. On the company Portal, each Business and each Function has a section providing information for the employees. News can be seen in a central place. The Portal also provides necessary resources to allow workers accomplish their tasks.

Sharepoint is also used to create and work with team sites. Every team can create a site to store and share lists and libraries. It is possible to give permission to others (to read or edit) for a section of the site or for a file. When working with a shared file, it is possible to ensure that no one else tries to modify it at the same time with the check out / check in feature.

1.1.3.4 Mobile devices

Some employees use a smart phone to sync their emails, their contacts and their agenda. Various brands and models are used, but they must run the Windows Mobile operating system, which is the current the company standard.

An internal working group is in charge of reevaluating the situation at least once a year. It is currently assessing the Apple iPhone.

1.2 Current Problems

Although the users are satisfied with the products in place, some problems are pushing the IT managers to find an alternative.

1.2.1 The Cost of Licenses

Microsoft Office, Exchange and Sharepoint licenses are expensive. In short, the cost of licenses includes:

- End-user computer applications: MS Office, MS Communicator
Server applications: Exchange, Sharepoint, Instant Messaging (OCS)
Client Access Licenses (CAL) for Exchange, Sharepoint, Instant Messaging

Discounts are negotiated with Microsoft.

1.2.2 The Complex Licensing Model

Microsoft licensing options are complex:

- A service can be composed of two distinct products to choose from and to buy: the server application and the Client Access Licenses (CAL).
- The products often exist in several versions. We are not only speaking of releases, but also of editions. Example 1: Exchange Server 2007 CAL exists in Standard or Enterprise version. Example 2: Office Communication Server 2007 CAL also exists in Standard or Enterprise version. Only the Enterprise version includes audio and video conferencing.
- Some products can be bought by group (package). A group of products exists in different versions. Example: the Core CAL includes standard client access to Windows Server, Systems Management Server, Exchange Server and Sharepoint Server.
- The license models can change with each new version. Example: with the previous version of Office Communications Server (Live Communications Server 2005), the Core CAL was sufficient to install the client (Microsoft Office Communicator or MOC). With the new version (OCS 2007), this is no longer possible. An additional license must be purchased.
- Some new versions of a product are not compatible (or less compatible) with older versions of another product. This means that upgrading a product to a new version can imply upgrading another one. Example: the company experienced stability issues with computers having the new version of Office Communicator (MOC 2007). The problem was resolved by upgrading Office 2003 to Office 2007.

Time spent by the company IT managers understanding and negotiating contracts with Microsoft is estimated at 60 man-days per year.

1.2.3 The Microsoft Dependency

The company depends heavily on Microsoft. On the client side and on the server side, many applications are supplied by Microsoft:

- Messaging and instant messaging
- Office applications
- Information and collaboration solutions (Sharepoint)
- Operation systems
- Administration tools
- SQL database
The high dependence on Microsoft gives some power to Microsoft on the company to impose their terms. Because of this power, the company can be forced to follow Microsoft and adopt their products, even if the prices and migration efforts are high. This dependence makes it risky, difficult and costly to find and change to another supplier.

1.2.4 The Contractors' Problems

The company needs to give contractors an email address and corresponding messaging services. Currently, the company also offers them an unnecessary access to the company environment and the use of Microsoft Office. The number of contractors is estimated between 2000 and 3000.

The following problems concerning the contractors have been identified:

- The access to the company environment is a security issue.
- Identifying them in the system is difficult.
- The unnecessary features provided to the contractors generate a relatively important cost for the company.

1.3 Finding a Solution

Because of the problems described above, it is worth looking for an alternative to decrease or eliminate these problems.

Moreover, it is the role of the IT department to continuously explore solutions that could bring benefits to the company.

1.3.1 Other Solutions

In 2009, the IT department tested Open Office as an alternative to Microsoft Office. At the end of the test period, it was decided not to implement it. The main reasons were the following deployment and compatibility issues:

- Unlike Microsoft Office, Open Office does not allow preparing a core standard package and choosing the language on top. It is necessary to have a specific whole package for the whole application.
• It is not possible to apply patches; the application needs to be completely
reinstalled (unless using proprietary solutions such as StarOffice\(^1\) or Novell
Open Office\(^2\)).

• Compatibility issues were revealed during the test. The layout of some
documents was altered.

Microsoft is launching an online solution with Office 2010, but it would not resolve the
Microsoft dependency problem. Other online solutions such as Zoho\(^3\) or Acrobat.com\(^4\)
from Adobe exist. The overall viability of Google as a company and its leader position
in many domains make Google Apps a preferred choice.

1.3.2 The Google Solution
During the IT Council\(^5\) of November 2009, the IT managers from Geneva Headquarters
proposed to assess Google Apps. At that time, Google was actively contacting
to enterprises in order to sell Google Apps, a product covering e-mail, instant messaging
and office applications.

Even though moving from Microsoft to Google would be a major change, the attractive
pricing, the simplicity of the license models and the fact of having an option next to
Microsoft led to look more closely at Google Apps. It was decided to test Google Apps
Premier, the enterprise edition of Google Apps.

1.3.3 Early Adopters Feedbacks
Part of the Project consists in searching for Google Apps early adopters to receive their
feedback. Google references several multinational companies\(^6\). Furthermore, a part of
the Project Team met in Zurich the CIO of a company now implementing Google Apps
for 8000 employees worldwide. But the situation and the motivations of these
companies seem to be different: unlike the company described in this thesis, which has
a homogeneous environment, the companies referenced by Google are standardizing

\(^1\) [http://www.oracle.com/us/products/applications/open-office/index.html]
\(^2\) [http://www.novell.com/products/openofficewindows/]
\(^3\) [http://www.zoho.com/]
\(^4\) [https://acrobat.com/]
\(^5\) The IT Council coordinates the IT initiatives in the company.
their multiple messaging systems. Furthermore, they are not replacing Microsoft Office, at least in a first step.

1.4 **What is Google Apps?**

Google Apps is a web application suite\(^7\). With only a browser, it is possible to use multiple Google services over the Internet.

Google Apps uses the cloud computing\(^8\) technology in the sense that

- it uses several data centers.
- the customer doesn't know on which data centers the applications and documents are stored.
- it provides elastic, on-demand storage billed only for what is used (it depends on the number of accounts).

More precisely, Google Apps uses a SaaS (Software-as-a-Service) model: Google acts as a service provider by hosting applications and making them available to the end-user over the Internet.

Google Apps includes applications similar to traditional office suites, and additional ones: messaging application, instant messaging tools, calendars, word processing, spreadsheets, presentations and a web site editor.

The services are managed by Google, and data is stored on Google data centers. Unlike free consumer applications provided by Google, Google Apps features are more oriented for business purposes.

1.5 **Challenges**

1.5.1 **Selling the Solution**

It might be difficult to make the end users adopt Google Apps. First of all, it is inexpensive. The end users might not appreciate receiving a cheaper solution than before. It will be important to focus on the advantages the solution provides them.

Furthermore, Google is a “Cloud” service. Because of the “Cloud” word, people might have the feeling that their data is floating somewhere on Internet. Even without this “Cloud” word, people can fear that confidentiality is an issue because the information isn’t stored in a known central place as before. It will be very important to reassure them on security and confidentiality.

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1.5.2 Managing an Heterogeneous Environment

The current environment is very homogeneous: the same office suite and the same mail system are used worldwide.

Google Apps is a new product in the company, coming from a new vendor (Google). At least during the pilot phase, the new product has to be added to the list of products used presently in the company. Even after the pilot, if it is decided to use the product for a very large number of users, some users might need to stay on the present products. So in any case, Google Apps will have to cohabit with the other products.

A new product adds complexity. First of all, it is a product to manage: deciding where to buy it, controlling the licenses, managing support and training, checking the evolution. Secondly, compatibility and integration with other products in use is a big concern.

1.5.3 Facing Political Aspects

1.5.3.1 The Google versus China conflict

Using Google Apps implies working over the Internet. In China, the authorities have controlled access to Internet for years. They have the possibility to censure information. Recently, Google decided to redirect users from the Chinese version of the Google’s search engine to the Hong Kong version.9

The company employs many people in China, and it is most important for them to have reliable services. During the pilot, it will be crucial for us to test the possibility of using Google Apps in China in an absolutely dependable manner.

1.5.4 Managing New Security Challenges

It is very important for the company to be sure that personal data (communications, documents, etc) are safe. They must remain available to some and shouldn’t be seen by others. If the company uses Google Apps, all data are stored in Google data centers. Because of the Cloud computer technology, data are stored in several data centers. For the company, it will be impossible or difficult to know where data are stored. It is important to be sure that using Google Apps is safe: the documents must be available; data shouldn’t be seen by non-authorized people.

In particular, answers to the following questions have to be found.

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Concerning the fact that Google Apps uses the Internet to provide access to the end user:

- Is it possible for a hacker to access data? Could uninvited people read the documents?
- How easy is it for the end users to access their data? Is it fast enough to work online? Are documents always available?

Concerning the fact that data are stored in Google data centers:

- What happens if there is an incident in Google data centers? Can the end users recover their data quickly?
- How is information stored? Is it encrypted? Could a Google worker access information?
- In which country are data stored? (If it is in the United States, the authorities could access the data)

Concerning Google’s technology:

- Google is known for its search engine technologies and its capability to scan documents automatically and store information coming from documents or users. Does Google scan the mails?
2. The GAPS Project

2.1 Objectives

2.1.1 IT Mission and GAPS Project

The IT Department mission is to provide to the users information technology solutions corresponding to their needs at minimum cost. Furthermore, the IT Department mission is to provide solutions that give the company competitive advantages.

In this context, the GAPS (Google Apps Premier Edition) Project enables the IT department to fulfill its mission by helping to find a solution to resolve the current costs, license complexity and Microsoft dependency.

In addition, the GAPS Project has an important role in facilitating technology watch activity and anticipating new solutions consequent to the cloud computing expansion.

2.1.2 Project Goal

The goal of the Project is to assess the suitability of Google Apps as an alternative to the current email, collaboration and office toolset.

2.1.3 Project Objectives

To meet the Project goal, the following objectives have been identified:

- Make a complete comparison of the current development status of Google Apps with the current solutions in the company.
- Estimate the cost of implementing Google Apps in the company.
- Evaluate Google Apps benefits and limitations in real business conditions by running a 3 to 6 month pilot with about 50 users representing the diversity of the company users.
- Produce a decision-making report with recommendations concerning the adoption and deployment of Google Apps for the company.

2.1.4 Desired Benefits

The desired benefits for the company by adopting Google Apps are the following:

2.1.4.1 Cost savings

Cost savings will be made on the price of licenses, on the management of email services by the external provider, on solution deployment, on technical support, and on the time spent by those in charge of managing licenses.
2.1.4.2 *Increased pressure in dealing with Microsoft*

Having an alternative to Microsoft solutions creates more bargaining power in confronting Microsoft.

2.1.4.3 *Increased end users agility*

The increased agility comes from more availability and better collaboration. Documents will be indeed available from anywhere at any time. Also, the company will benefit from a new interesting sharing feature: real-time collaboration editing. Furthermore, sharing a document with a business partner outside the company will be more efficient.

2.1.4.4 *Increased administrator agility*

The increased agility for administrators comes from the faster process of creating or deleting an account. A new user will be operational within a few seconds.

2.2 **Scope**

2.2.1 **In the Scope**

The scope of the GAPS Project is defined as follows:

- The Project is applied to the company worldwide. We analyze the possibility of using Google Apps within the company environment. However, it can easily be adapted to other companies, in spite of the fact that the deployment and integration aspects depend on the company organization.
- The Project proposes the use of the actual company system (hardware, software, network), except where the pilot phase reveals a necessary change to be made. The content of the standard image used by the company computers is detailed further. The browser used for the Project is Internet Explorer 8.
- The Project focuses on Google Apps Premier edition.
- The Project considers replacing, for the concerned users, Microsoft Office (including email services) by Google Apps.

2.2.2 **Out of Scope**

As a consequence, the scope defines some aspects that will not be considered in the Project:

- The Project does not consider the possibility of providing for the same user Google Apps in addition to the (Microsoft Office) current solutions after the transition period.
- The Project doesn’t consider using a combination of existing solutions with Google Apps, such as Outlook with GMail or Exchange with GMail.
• The Project doesn’t consider using other browsers such as Google Chrome or Firefox.

• The Project does not analyze other possible alternatives to Microsoft Office, neither installed programs such as Open Office, nor online services such as Zoho. The Project does not analyze the Microsoft Office 2010 features.

2.3 **Deliverables**

The following results will be delivered during the Project:

2.3.1 **Customized Solution**

• A customized contract between the company and Google approved by both parties.

• A control panel setting preference list: the list refers to the administrator’s control panel. It describes which feature to enable and the successful setting values used at the company during the pilot.

• The company templates: the templates are standard documents containing corporate colors, styles and layouts. A template is provided for each of these applications: web sites, text documents and presentations.

• The company branding: the company logo and colors are applied on the login page. The company logo is also applied on the upper left corner of every end user application.

2.3.2 **User Guides**

• A Helpdesk Welcome Package\(^\text{10}\): this two page document is a guide for local helpdesks. It provides information for setting up the pilot users’ accounts.

• An End User Welcome Package\(^\text{11}\): this two page document is a guide for pilot end users. It provides the necessary information to enable them to start using Google Apps.

2.3.3 **Surveys**

• An End User Survey: a set of questions to receive feedback from the pilot users concerning their satisfaction with the use of Google Apps. The Project Team will collect their answers and analyze them.

• A Helpdesk Survey: a set of questions to receive feedback from the local helpdesks concerning their support to the pilot users. The Project Team will collect their answers and analyze them.

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\(^{10}\) See Annex 2

\(^{11}\) See Annex 1
2.3.4 Final Documents

- A user segmentation report: it describes a user classification into different groups, depending on their needs and the ability of Google Apps to provide solutions corresponding to their requirements. The report sorts the categories from good candidate to move on Google Apps to unlikely candidate to use Google Apps.
- A cost analysis document describing the return on investment (ROI).
- An impact analysis for Country Managing Directors describing the impact on end users, on the support and on costs.
- A set of recommendations for the company management, which can be used as a decision making report by the CIO.

2.4 Stakeholders

Table 1 lists the people affected by or having an influence on the Project and their motivation.

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Council</td>
<td>Have an alternative to Microsoft Office for company users, saving costs.</td>
</tr>
<tr>
<td>CIO</td>
<td></td>
</tr>
<tr>
<td>Project Senior Manager</td>
<td></td>
</tr>
<tr>
<td>Project Manager</td>
<td>Conduct the Project with success</td>
</tr>
<tr>
<td>Team members</td>
<td></td>
</tr>
<tr>
<td>Country IT Managers</td>
<td>Have a cheaper solution</td>
</tr>
<tr>
<td>Country Helpdesks</td>
<td>Support users effortlessly</td>
</tr>
<tr>
<td>Company users</td>
<td>Work with a user-friendly solution to achieve their business tasks.</td>
</tr>
</tbody>
</table>

2.5 Resources

2.5.1 People

Table 2 lists the people involved in the Project, their responsibilities and the percentage of their work time to spend on the Project Elaboration and Pilot phases.

<table>
<thead>
<tr>
<th>Who</th>
<th>Responsibilities</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision Making Level</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Google Apps as an Alternative to Microsoft Office in a Multinational Company
BOURQUIN Luc

2.5.2 Equipment and Facilities

There is no new equipment or facility needed for the Project.
2.5.3 Budget

During the Project Elaboration and Pilot phases, the following aspects were considered when estimating the Project costs:

- Google Apps licenses
- Internal resources (see table above)
- External resource (One IT intern)
- Other expenses

During the Deployment and Follow Up phases, the following aspects were considered when estimating the Project costs:

- Google Apps licenses
- Internal resources (IT managers, administration team, local helpdesks)
- Dedicated Google support contact
- Other expenses

2.6 Project Schedule

The following workflow (Figure 3) shows the Project steps.

Figure 3 
Project Steps
The following chart (Figure 4) shows the Project time frame. The left column shows the Project phases and their main activities. The horizontal bars, showing activities, can be discontinued. In this case, the total duration of an activity is longer than the effective working time.

At the time of this writing, the Project Elaboration phase is arriving at its end. The timing concerning the next phases is the expected timing.

Figure 4
Project Schedule

As can be seen, finalizing the contract was a long process.

2.7 **Project Elaboration**

During the Project Elaboration phase, the following tasks need to be achieved:

2.7.1 **Examine the Google Apps offering**

The Project Team members assess Google Apps offering.
They find and discuss with Google Apps early adopters. A part of the Project Team travelled to Zurich to consult with the CIO of a multinational company who signed up for 8000 employees worldwide.

The Project Team members look for a Google Apps integration partner. The company’s usual partner, which is a reseller for Microsoft products, is also a Google reseller. But they don’t provide expertise on accompanying a company adopting Google Apps. They did, however, sign a partnership with a French company that has this expertise.

### 2.7.2 Assess Company Environment

The Project Team members verify how well Google Apps works in the company's environment.

They make the technical configurations required in the company environment and through the Google Apps administration panel. They test Google Apps services and their features.

### 2.7.3 Finalize the Contract

The standard contract provided by Google needs to be customized to implement the company’s specific requirements. Here are some examples of points that need to be clarified:

- Is it possible to restore data mistakenly deleted by an end-user?
- How is the “monthly uptime percentage” of 99.9% calculated?
- Concerning Google’s helpdesk, what are the criteria used to determine the request’s category?

The customized contract will be valid for the pilot and for future deployment.

Because of Google, negotiating the contract is a lengthy process for several reasons:

- The study of the contract is difficult because the document sent by Google contains a number of hyper links to other documents which in turn also contain hyper links to other documents.
- There are long delays in receiving answers to the Project Team questions or meeting invitations.
- There is also a long delay in receiving Google’s approval for the final version of the contract (it must be validated by several people from Google). At the time of writing, the Project Team has been waiting a month.

Considering that the senior Project manager asked Google people several times to accelerate the process and that the company is a potentially big customer, Google’s delay is disappointing and may be a cause for concern.
2.8 Pilot Phase

2.8.1 Pilot Objectives

Concerning the pilot phase, the following objectives have been identified:

- Make 50 company users work with Google Apps in a real environment for a period of 3 to 6 months.
- Measure company users’ satisfaction and productivity with the Google Apps offering through a feedback survey.
- Classify company users according to their needs and the ability of Google Apps to provide solutions corresponding to their requirements.
- Quantify support needed by Google Apps users.

2.8.2 Pilot Scope

2.8.2.1 General aspects

The scope of the pilot is defined as follows:

- 50 company users will participate. They represent the diversity of the company users in terms of geographical location and business lines. The varied needs and expectations of the users bring a revealing and thorough feedback.
- The pilot users will experiment the features of Google Apps Premier edition.

2.8.2.2 Google Apps features

The following features will be tested during the pilot:

- GMail, Google Calendar, Google Docs (by all pilot users)
- Google Talk (only by those using instant messaging before)
- Google Apps Mobile (only by those using a mobile device before)
- Offline feature for GMail and Google Calendar with Google Gears
- Sharing and collaboration features, including real-time collaboration
- Anti-spam and antivirus tools

2.8.2.3 Other considerations

The following considerations need to be taken into account:

- Synchronization between Outlook and Google Apps will be made by installing the “Google Apps Sync” tool on the pilot users’ computers.
- The current company equipment will be used for the pilot. The computers can be laptops or desktops.
- The browser will be Internet Explorer 8.
- The version of Google Apps will be the version provided at the time of the pilot.
2.8.2.4 **Out of scope**

These features will not be implemented for the pilot:

- The free/busy information between Google Apps users and Outlook users
- The connector between Communicator and Google Talk
- The Single Sign On feature

2.8.3 **Pilot Process**

The pilot is divided into 3 phases.

2.8.3.1 **Pilot elaboration**

During the Elaboration phase, the following tasks are achieved in order to get the pilot ready to start:

- Electing pilot users
  A group of users representing the diversity of the company users will be chosen. The Project managers ask country IT managers to give some names, and a team member will collect names and create and maintain the pilot users list on an intranet page. The list contains the user names and some technical details.
- Defining success criteria
  The Project Team defines the conditions that need to be verified in order to add Google Apps to the company portfolio. Feedback surveys are prepared to collect data. See the “Success criteria” paragraph.
- Informing helpdesks and pilot users
  The Project Team prepares and educates the helpdesks staff and pilot users in order to run the pilot.

2.8.3.2 **Running the pilot**

During the Running phase, the following tasks are achieved in order to run the pilot:

- Launching the pilot
  The Project Team gives the pilot users an access to Google Apps.
- Answering helpdesks
  The Project Team answers questions coming from the local helpdesks. If necessary, the Project Team contacts Google.
- Feedback (pilot users)
  The Project Team distributes surveys
- Feedback (administration, feedback from helpdesks)

2.8.3.3 **Pilot evaluation**

During the Evaluation phase, the following tasks are achieved in order to evaluate the pilot:
• Analyze feedbacks
  From the data collected by the feedback surveys, it is possible to define user categories. Thus the results can be shown by category.

• Take a decision on the continuation of the pilot.
  If necessary, the Project Team takes a corrective action and goes back to 2.8.3.2 (Running the Pilot). Examples of corrective actions are: configuration changes and training organization.

• Decommission Google Apps
  After the pilot running, the pilot users will stop using Google Apps services and roll back to the standard Microsoft solutions. The local helpdesks will help the end users to do this. The local helpdesks will receive the decommissioning procedure elaborated by the Project Team. The decommissioning is a sensitive step: it is important to keep user’s data (mails, calendar information, documents…).

• Evaluate the success of the Pilot
  The Project Team checks the results of the pilot against the success criteria. They create the necessary deliverables including the recommendations. The CIO takes a decision concerning the continuation of the Project.

The flowchart below (Figure 5) shows the support escalation process during the pilot.

![Figure 5: Pilot Escalation Process](image)

The role of the local helpdesks is to support the pilot users. If they need support, they question the Project Team.

2.8.4 Success Criteria

The success criteria are the conditions that need to be verified in order to add Google Apps to the company portfolio.

While some criteria are objectively measurable, others are more subjective. Some criteria are eliminatory.

2.8.4.1 Success criteria categories

The success criteria can be classified into the following categories:
To determine if the success criteria are met, indicators coming from different sources are used: pilot users and helpdesks feedback surveys, information provided by Google, Project Team researches.

Depending on their importance, criteria were weighted by the Project Team members. Table 3 lists the success criteria by category.

Table 3

<table>
<thead>
<tr>
<th>Category</th>
<th>Subject</th>
<th>Success Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractual aspects</td>
<td>Agreement</td>
<td>The company and Google agree on a customized contract</td>
</tr>
<tr>
<td></td>
<td>Compliance with contract commitment</td>
<td>The contractual points were respected during the pilot</td>
</tr>
<tr>
<td>Business requirements</td>
<td>Compliance with corporate policies (Legal, IT, CorpCom…)</td>
<td>Google Apps is compliant with at least 90% corporate policies</td>
</tr>
<tr>
<td></td>
<td>Compatibility with Microsoft Office documents</td>
<td>The average score of the related question(s) is at least 4/5.</td>
</tr>
<tr>
<td></td>
<td>Other business requirements</td>
<td>Google Apps is compliant with at least 90% of the other business requirements</td>
</tr>
<tr>
<td>Financial aspects</td>
<td>Helpdesk cost</td>
<td>The average number of pilot users call to the helpdesk is 5 maximum during the last month of the pilot.</td>
</tr>
<tr>
<td></td>
<td>Critical Mass</td>
<td>The critical mass (see Financial Aspects) would be reached</td>
</tr>
<tr>
<td></td>
<td>Total Cost</td>
<td>The new solution will cost at least 30% less than the current available solution.</td>
</tr>
<tr>
<td>Support</td>
<td>Online resources</td>
<td>The average score of the related question(s) is at least 4/5.</td>
</tr>
<tr>
<td></td>
<td>Support from Google</td>
<td>The company has an interlocutor from Google within maximum 24 h.</td>
</tr>
<tr>
<td>Operational aspects</td>
<td>Integration</td>
<td>Google Apps integrates well enough in the company environment.</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Deployment</td>
<td>Google Apps is easy enough to implement.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>There is a roll back possibility.</td>
</tr>
<tr>
<td></td>
<td>Administration</td>
<td>Google Apps is easy enough to administrate.</td>
</tr>
<tr>
<td>Security</td>
<td>Availability</td>
<td>The contract guarantees availability 99.9% of the time.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The average score of the related question is at least 4/5.</td>
</tr>
<tr>
<td></td>
<td>Confidentiality</td>
<td>The contract guarantees users' data confidentiality.</td>
</tr>
<tr>
<td></td>
<td>Integrity</td>
<td>The contract guarantees users' data integrity.</td>
</tr>
<tr>
<td>User satisfaction</td>
<td>Usability</td>
<td>The average score of the related question(s) is at least 4/5.</td>
</tr>
<tr>
<td></td>
<td>Stability</td>
<td>The average score of the related question(s) is at least 4/5.</td>
</tr>
<tr>
<td></td>
<td>Intuitiveness</td>
<td>The average score of the related question(s) is at least 4/5.</td>
</tr>
<tr>
<td></td>
<td>Functionality</td>
<td>The average score of the related question(s) is at least 4/5.</td>
</tr>
<tr>
<td></td>
<td>Performance</td>
<td>The average score of the related question(s) is at least 4/5.</td>
</tr>
<tr>
<td></td>
<td>Compatibility with Microsoft Office documents</td>
<td>The average score of the related question(s) is at least 4/5.</td>
</tr>
</tbody>
</table>

### 2.8.4.2 Success factors

The following factors cannot be measured prior to the final decision but have an important impact on the continuation of the Project:

- Support from country managers: it is important that country managers be interested in Google Apps. The expected saving must be realized.
- Support from an integration partner: helpful support from a Google integration partner will have a positive impact on the adoption of the new solution.
- Accurate positioning of Google Apps: to ensure positive continuation of the Project, the Project Team must identify accurately the positioning of Google Apps in comparison to Microsoft Office.
- Human factors: subjective feelings from all stakeholders can influence the Project positively or negatively (see the Human Factors section).
2.9 Decision Process

If the success criteria have been met, the following recommendations will be made.

The final decision concerning these recommendations will be done by the CIO.

- Include Google Apps in the company portfolio?
  If the success criteria are met, the Project Team will recommend including Google Apps in the company portfolio. If they are not, the Project Team will decide if it is worth staying up to date with the evolution of Google Apps. If the answer is positive, they will recommend the ideal moment to analyze Google Apps offering again.

If the Project Team recommends including Google Apps in the portfolio, the following recommendations will also be made.

- Provide Google Apps for whom?
  The Project Team members will describe for which category of users they recommend providing Google Apps.

- Mandatory or optional use of Google Apps?
  The Project Team will describe for each selected category of users whether the use of Google Apps should be optional or mandatory.

- Rollout Google Apps as described in the recommendations?
  The Project Team will recommend the timing and the process of Google Apps rollout.

The Project Team recommendations will be submitted to the IT Council. The CIO will make the final decisions.

2.10 Deployment

The deployment of Google Apps consists in adding Google Apps to the company IT portfolio. The country IT managers will be informed that the new solution will be available from a certain date. They will be responsible for providing the solution to their users. The role of the corporate IT managers is to coordinate the deployment.

The deployment process is detailed in the Operational Aspects chapter.

2.11 Follow Up

After the deployment of Google Apps, it is important to follow the evolution of the new solution with the following activities:

- Monitor the operating aspects and the use of Google Apps
- Verify the operating status of Google Apps services. The Google Apps dashboard can help achieve this task.
- Provide the necessary documentation or training. For example, it might be necessary to organize training sessions on specific topics.
- Organize regular feedback to a selection of end users and support
• Track and anticipate Google Apps changes
  Google Apps is a product in constant evolution. Moreover, changes
  concerning the features are made without the customer’s approval. For
  these reasons, it is important to watch the product’s evolution in order to
  make a decision when it is necessary.
3. Using Google Apps

3.1 Google Apps Offering

3.1.1 Overview

Google Apps is a web application suite (Figure 6). It includes communication, collaboration and productivity applications. The following applications are included in Google Apps:

- **GMail**: an email service with tasks and a built-in instant messaging, voice and video chat tool
- **Google Calendar**: a calendaring tool with sharing features and room and resource scheduling
- **Google Docs**: a set of office productivity applications including word processing, spreadsheets, and presentations. Documents are saved online.
- **Google Sites**: a website creating tool providing a collaboration environment
- **Google Video**: a video sharing service within the company
- **Google Groups**: a discussion group application with mailing list management

![The Google Apps Logo](source: Google)

Administrator features are provided through the administrative control panel.

For businesses, two editions exist: Premier and Standard. Only the Premier edition is conceivable for the company. Unlike the Standard edition, the Premier edition includes:

- a 25 GB mail storage space
- unlimited users, whereas the Standard edition is limited to 50 users
- customer support 24/7
- a Service Level Agreement guaranteeing 99.9% uptime
- integration and migrating tools
• business and security features

Annex 4 shows a comparison between both editions. The pricing details are described in the Financial Analysis section.

3.1.2 Storage Capacity

With GMail, the company users’ storage capacity will increase to 25GB. The benefit of so large capacity is that users never need to clean their mailbox. As a consequence, they save time. Old emails can be found using the search and organizing features. Table 4 compares the storage capacity of the current solution with Google Apps.

Table 4
Storage capacity comparison

<table>
<thead>
<tr>
<th>Category</th>
<th>Current solution</th>
<th>Google Apps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mailbox</td>
<td>300MB or 600MB</td>
<td>25GB</td>
</tr>
<tr>
<td>Documents</td>
<td>500MB (Personal drive capacity)</td>
<td>1 GB upload limit</td>
</tr>
<tr>
<td>Web sites</td>
<td>2 GB/teamsite</td>
<td>10GB for the whole domain + 500MB per user (Max attachment size: 50MB)</td>
</tr>
<tr>
<td>Videos</td>
<td>N/A</td>
<td>3GB per user (shared with the entire domain)</td>
</tr>
</tbody>
</table>

3.1.3 Security Features

The Premier edition provides access to security and archiving solutions provided by Postini, a service owned by Google. Table 5 compares the security features.

Table 5
Security Features Comparison

<table>
<thead>
<tr>
<th>Feature</th>
<th>Current provider</th>
<th>Google Apps Premier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spam and virus filtering</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>End users' archiving</td>
<td>Yes</td>
<td>No*</td>
</tr>
<tr>
<td>Administrative journaling</td>
<td>Yes</td>
<td>Yes, it's possible with the Message Discovery option for an extra cost. Google calls this feature Archiving.</td>
</tr>
</tbody>
</table>

*Google Apps doesn't provide archiving for end users. Users have a large email storage capacity but don't have a separate place to archive their data.
3.1.4 Service Level Agreement

The Service Level Agreement (SLA) is a part of the contract between the company and Google Apps. It formalizes the services performance objectives and requirements. The SLA covers the main applications (GMail, Google Calendar, Google Talk, Google Docs, Google Groups and Google Sites), but not the GMail Labs features or Gmail voice and video chat.

The following table (Table 6) compares the Google’s SLA with the one now in use in the company. The term *downtime* is used to refer to periods when the system is unavailable. The SLA doesn’t include planned downtime.

Table 6
SLA Comparison

<table>
<thead>
<tr>
<th>Category</th>
<th>Current provider</th>
<th>Google Apps Premier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability</td>
<td>99.8% of uptime in a given month</td>
<td>99.9% of uptime in a given month</td>
</tr>
<tr>
<td>Downtime definition</td>
<td>A certain percentage defined by a formula based on the number of impacted users and duration</td>
<td>user error rate &gt;5% (measured on server side error rate)</td>
</tr>
<tr>
<td>Minimum downtime</td>
<td>No</td>
<td>10 minutes</td>
</tr>
<tr>
<td>Penalty for non-compliance</td>
<td>Monetary amounts</td>
<td>Time credit: days added to the end of term</td>
</tr>
<tr>
<td>Penalty amount</td>
<td>Monetary amount based on measured downtime</td>
<td>&lt; 99.9%: 3 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 99.0%: 7 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 95.0%: 15 days</td>
</tr>
<tr>
<td>Maximum penalty</td>
<td>Yes</td>
<td>15 days/month</td>
</tr>
<tr>
<td>Automatic penalty</td>
<td>Yes</td>
<td>No (customer must notify Google)</td>
</tr>
<tr>
<td>User’s mistake disaster recovery</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>SLA exclusions</td>
<td>Issues caused by factors outside of provider’s control</td>
<td>Issues caused by factors outside of Google’s control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Experimental features under Google Labs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Offline feature</td>
</tr>
<tr>
<td>Maximum mail delivery</td>
<td>Yes (measured on an average)</td>
<td>No</td>
</tr>
<tr>
<td>time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scheduled downtime</td>
<td>2h/month to be approved by the company</td>
<td>12h/year announced at least 5 days before</td>
</tr>
</tbody>
</table>
With a large uptime guarantee, Google’s provides an SLA that ensures performance. However, not providing restore after an accidental deletion is a security concern for the company.

### 3.2 End User Perspective

Google Apps is continuously improving. New features are added regularly. This section describes the features available at the time of writing.

#### 3.2.1 Functionality

##### 3.2.1.1 Notable features

Table 7 identifies interesting features as observed by the Project Team.

**Table 7**

<table>
<thead>
<tr>
<th>Application</th>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>All applications</td>
<td>Customization</td>
<td>Users can choose the language of the interface (about 40 languages).</td>
</tr>
<tr>
<td></td>
<td>Access from anywhere</td>
<td>Since Google Apps is an online suite, users can manage and access their documents from anywhere (smart phones included).</td>
</tr>
<tr>
<td></td>
<td>Search</td>
<td>Google search technology, fast and accurate, is built in, so users can find business content simply with the familiar Google search box. Common searches can be preserved by building a filter.</td>
</tr>
<tr>
<td>GMail</td>
<td>Threads</td>
<td>Gmail groups all replies with their original message into a “conversation”.</td>
</tr>
<tr>
<td></td>
<td>Labels</td>
<td>Labels act a lot like folders, but messages can have multiple labels. By default, labels cannot be hierarchically organized (Outlook 2007 has a similar concept with categories).</td>
</tr>
<tr>
<td></td>
<td>Instant messaging</td>
<td>Integration of IM and email on a single page.</td>
</tr>
<tr>
<td></td>
<td>Voice and video conferencing</td>
<td>Voice and video on the same platform as email and IM.</td>
</tr>
<tr>
<td>Google Calendar</td>
<td>Meeting</td>
<td>The meeting organizer can empower invitees to invite others.</td>
</tr>
<tr>
<td>Google Docs - Overall</td>
<td>Saving</td>
<td>The auto-save feature makes sure no data is lost in case of problem.</td>
</tr>
<tr>
<td></td>
<td>File storing</td>
<td>Google Docs can be used to store any type of files.</td>
</tr>
<tr>
<td>Spreadsheets</td>
<td>Forms</td>
<td>Users can create forms to collect survey data. Forms can be published on web pages.</td>
</tr>
</tbody>
</table>
Input automatically populates the associated spreadsheet.

Scripts
It is possible to use scripts to automate repetitive tasks within the spreadsheet or to automate simple tasks across Google products. Scripts must be written by advanced users because they are coded in Javascript.

Presentations
Charts
Charts or spreadsheets cannot be embedded.

Google Sites
Site creation
Users can create all types of websites: team, project, departmental, training, wikis, and more.

Rich content embedding
Documents, spreadsheets, slide shows, videos or gadget can be displayed all in one place (for example on the existing intranet or on a Google site).

Google Groups
Group management
Groups are online communities sharing information via email or web discussions. Users can easily create and manage groups. Members can create alerts.

Reply on behalf of a group
Groups can serve as a central point to receive communications, and members can reply on behalf of the group.

Google Video
Video
It is possible to publish videos within the company. It can be useful to make executive communications more visual or trainings more engaging.

<table>
<thead>
<tr>
<th>Application</th>
<th>With individuals</th>
<th>Company-wide</th>
<th>Internet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Google Calendar</td>
<td>Share a calendar with the Project Team</td>
<td>Share a useful calendar. It can easily be embedded into web pages</td>
<td>Publicize external company events</td>
</tr>
</tbody>
</table>

3.2.1.2 Collaboration features

Google Apps offers many collaboration features. It is possible to share documents with individuals (external or internal users), with all company users, or to publish documents on the Internet. The document’s owner can choose the permission level: owner, contributor or reader. Google Docs also provides a real-time collaboration feature. With this feature, all users see changes immediately and simultaneously. Table 8 describes collaboration features and examples of use.

Table 8
Collaboration Features
<table>
<thead>
<tr>
<th>Application</th>
<th>Features</th>
<th>Other Features</th>
</tr>
</thead>
</table>
| Google Docs | Collaborate with co-workers with any type of file. File versioning is done automatically. Send an invitation with a link to your document. Collaborate with external partners. Let multiple users work together, editing online at the same time. Deliver presentations to remote audiences. Create web forms and collect survey data. Publish documents and spreadsheets as internal web pages for easy employee review. Share a document on Internet Collect survey data with web forms. | The collaboration features make Google Docs a very good option for collaborating. Compared to Microsoft Office and Sharepoint in the company, some features provide new business opportunities:  
- **Real-time collaboration:** The real time collaboration feature can make users more productive, as they can avoid emailing a document back and forth. In addition, they need not wait for the co-worker to finish his editing. Furthermore, collaborating is more dynamic and interactive. The instant messaging tool is integrated in every Google Docs application.  
- **External partner collaboration:** The collaboration with external partners is more productive. Instead of emailing or going through the heavy process of setting up an extranet, a user can invite any external partner to read or to edit a document. There is no risk of incompatible software. They can also use the real time collaboration feature. The user can also set up a web site to share all types of documents. There is no need of IT support to set up external file sharing.  
- **Video sharing** |
| Google Sites | Share a site internally with external users such as partners or clients. Share documents and videos with your team in a central place. Publish non-sensitive information. |  
| Google Groups | Moderate messages with content approval before message distribution. Share content with a group instead of individuals. The group owner manages who has access to the content. Collect data from outside the company with a group discussion. |  
| Google Videos | Publish videos to make trainings more engaging. Users can rate the video. Make executive communications more visual. Publish a video to be seen by partners. They can write comments. |  

3.2.1.3 Other features

Other features include:
Mobile access: Google Apps provides a two-way synchronization between email, calendar and contacts on a mobile device and Google Apps. It is compatible with the corporate standard (Windows Mobile) and the Apple iPhone.

Offline feature: the offline capability is implemented by dropping a replica of the application code and a local cache of the user’s data into the user’s computer. The data is uploaded when the Internet connection is restored. For the time being, it is available for mails, the calendar and the contacts. It should be available for documents in a near future. There is a feature called “Flaky Connection Mode”. When it is enabled, data will sync automatically in the background when possible, depending on the Internet connection.

3.2.1.4 Missing features

Many features existing in Microsoft Office are not available in Google Apps. Table 9 outlines the main missing features identified by the Project Team.

<table>
<thead>
<tr>
<th>Application</th>
<th>Category</th>
<th>Issue</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>All applications</td>
<td>Offline</td>
<td>The offline feature is not available for Google Docs.</td>
<td>High</td>
</tr>
<tr>
<td>Google Calendar</td>
<td>Meeting</td>
<td>Optional and required attendees are not differentiated.</td>
<td>Low</td>
</tr>
<tr>
<td>Gmail</td>
<td>Importance levels</td>
<td>Importance levels such as High priority or Low priority do not exist</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Follow-up flags</td>
<td>Doesn’t have multiple types of flags with reminders, just stars and labels</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Follow-up flags for contacts do not exist.</td>
<td>Low</td>
</tr>
<tr>
<td>Distribution lists</td>
<td></td>
<td>Distribution lists cannot include addresses that are not in the Contacts</td>
<td>Medium</td>
</tr>
<tr>
<td>Out of office</td>
<td></td>
<td>Cannot indicate start and end time (only dates)</td>
<td>Medium</td>
</tr>
<tr>
<td>Mail options</td>
<td></td>
<td>No Delivery Receipts, Read Receipts, Sensitivity Flags or Voting Buttons</td>
<td>Medium</td>
</tr>
<tr>
<td>Signature</td>
<td></td>
<td>No ability to define several signatures</td>
<td>Medium</td>
</tr>
<tr>
<td>Contacts</td>
<td></td>
<td>No ability to choose how contacts appear in the list (Display As field)</td>
<td>Medium</td>
</tr>
<tr>
<td>Tasks</td>
<td></td>
<td>Tasks do not offer reminders or email routing.</td>
<td>Medium</td>
</tr>
<tr>
<td>Notes</td>
<td></td>
<td>The Outlook sticky notes do not exist.</td>
<td>Low</td>
</tr>
<tr>
<td>Journal</td>
<td></td>
<td>There is no Outlook Journal equivalent (a tool to record activities)</td>
<td>Low</td>
</tr>
<tr>
<td>Google Docs</td>
<td>Views</td>
<td>Cannot split screen</td>
<td>Low</td>
</tr>
<tr>
<td>-------------</td>
<td>-------</td>
<td>---------------------</td>
<td>-----</td>
</tr>
<tr>
<td>Formatting</td>
<td>There is no equivalent to the format painter tool</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Check out feature</td>
<td>The check out feature does not exist.</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Undo</td>
<td>It is not possible to undo several actions.</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Saving</td>
<td>It is not possible to close the document without saving.</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Print screen</td>
<td>&quot;Print screen&quot; pasting is not available.</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Text documents</td>
<td>Automated spell checking</td>
<td>The spell checker is not automatic.</td>
<td>Low</td>
</tr>
<tr>
<td>Auto-correct feature</td>
<td>No auto-correct feature</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Formatting</td>
<td>No paragraph marks or other hidden formatting symbols</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Formatting</td>
<td>There are no user-defined styles.</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Grammar checking</td>
<td>No grammar checking</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Tables</td>
<td>In tables, the cursor is not aligned.</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Views</td>
<td>An outline view is not available.</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Presentations</td>
<td>Images</td>
<td>Images from documents cannot be pasted into presentations.</td>
<td>Medium</td>
</tr>
<tr>
<td>Charts</td>
<td>Charts cannot be copied from Google Spreadsheets and pasted into Google documents.</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Special effects</td>
<td>There are no animations or transition effects available.</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Master slide</td>
<td>Master slides are not available.</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Decorative text</td>
<td>Decorative texts (WordArt) are not available.</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Spreadsheets</td>
<td>Macros</td>
<td>No macro recording. Macros can only be written in JavaScript.</td>
<td>High</td>
</tr>
<tr>
<td>Print</td>
<td>Ability to select the print area is lacking.</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Charts</td>
<td>Charts cannot be copied from spreadsheets and pasted into Google Docs</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Google Sites</td>
<td>Alerts</td>
<td>It is not possible to receive alerts on a daily basis (only at each change).</td>
<td>Medium</td>
</tr>
</tbody>
</table>

In addition, a lot of advanced features are missing, such as cross-referencing and watermarks in Word, or pivot tables and goal seek in Excel.
3.2.2 Compatibility

Google Apps compatibility with file formats currently in use in the company is an important success criterion. The following observations were made by the Project Team when working with some aspects not compatible with Microsoft (MS) Office files.

3.2.2.1 Opening MS Office files

The following observations were made:

- Concerning the files stored on the computer, it is not possible to open them directly as the offline feature doesn’t support documents. They must first be uploaded to Google Docs.
- Concerning the MS Office files received in GMail as attachments, we were always able to view them, but the layout was often altered. Some of these files could not be edited. We had first to download them on the computer, and then upload them on Google Docs.
- Concerning files available in a Sharepoint site, they could not be opened directly. In order to view them, we also had first to download them on the computer, and then upload them on Google Docs.

3.2.2.2 Compatibility of documents from MS Office to Google Apps

The table below identifies the issues that the Project Team encountered when converting MS Office documents into Google Apps (conversion is necessary to edit the document).

**Table 10**

<table>
<thead>
<tr>
<th>Application</th>
<th>Feature</th>
<th>Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>Password protection</td>
<td>We were unable to open password-protected documents.</td>
</tr>
<tr>
<td>Presentations</td>
<td>Special effects</td>
<td>All animation and transitions in the original PowerPoint show were lost.</td>
</tr>
<tr>
<td></td>
<td>Layout</td>
<td>The position of some objects was modified.</td>
</tr>
<tr>
<td>Text documents</td>
<td>Formatting</td>
<td>Document formatting in Word was altered in Google docs (font types, document layout, and tables)</td>
</tr>
<tr>
<td></td>
<td>Footers</td>
<td>The position of the footers was changed.</td>
</tr>
<tr>
<td></td>
<td>Revision tools</td>
<td>The “tracked changes” were incompatible.</td>
</tr>
<tr>
<td></td>
<td>Watermarks</td>
<td>Some watermarks do not appear.</td>
</tr>
<tr>
<td></td>
<td>Multilevel numberings</td>
<td>Multilevel numberings were converted in single level numbering.</td>
</tr>
<tr>
<td></td>
<td>Page breaks</td>
<td>The position of the page breaks was slightly</td>
</tr>
<tr>
<td>Category</td>
<td>Project Team’s observation</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Services availability</td>
<td>We didn’t encounter any availability issues during our tests. Google provides an information page concerning the services’ availability: <a href="http://www.google.com/appsstatus">http://www.google.com/appsstatus</a></td>
<td></td>
</tr>
<tr>
<td>Google Docs</td>
<td>We observed delays when typing and scrolling down through large documents. If the delay is caused by the computer’s ability of running JavaScript, performance could be better with other browsers such as Google Chrome. Other browsers are however not in the Project’s scope.</td>
<td></td>
</tr>
<tr>
<td>Search feature</td>
<td>We are satisfied by the search feature in GMail and in the Docs list. For us, it was fast and accurate.</td>
<td></td>
</tr>
<tr>
<td>File loading time</td>
<td>We were satisfied by the file loading times. Examples: Upload to Google Sites: 15 sec for 5MB, 55 sec for 18MB. Download from Google Sites: 25 sec for 5MB, 70 sec for 18MB.</td>
<td></td>
</tr>
</tbody>
</table>

We conclude that because of the compatibility issues, some users are not good candidates to adopt Google Apps. Examples: finance specialists who rely on Excel macros integrated in the files they receive, legal specialists who cannot bear any alterations in documents.

### 3.2.3 Performance

As users’ productivity depends on Google Apps performance, this is an important success criterion. It will be evaluated by the pilot users through the feedback survey. Performance includes the speed and the availability of Google Apps services.

Table 11 describes the observations that have already been made by the Project Team. Performance can depend on the user’s environment. The environment currently used by the Project Team includes:

- Google Apps edition: Standard
- Browser: Internet Explorer 8
- Internet connection speed: 20Mbits/sec

**Table 11**

**Performance Observations**
Concerning the relative slowness that the Project Team experienced in some cases, the pilot results will provide information on a possible impact on the productivity.

### 3.2.4 End User Perspective Conclusion

Many advantages have been found. Google Apps offers collaboration features which can lead to new business opportunities, such as real time editing and the ability to share a document with an external partner. The messaging service allows the company users to save time, thanks to the large storage capacity and to the well organized mailboxes.

However, one should not recommend the adoption of Google Apps to some types of users. Advanced users would suffer from the lack of functionality and from compatibility issues, especially when opening Microsoft Office documents with rich content; frequent travelers and users in locations with unreliable Internet connections would be less productive.

### 3.3 Administration

#### 3.3.1 Administration Features

The ability to administrate Google Apps is one of the success criteria. It will be evaluated in real conditions during the pilot. Nevertheless, the Project Team already made the following observations (Table 12) concerning the features provided through the administrative control panel.

<table>
<thead>
<tr>
<th>Category</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>End-user services</td>
<td>It is possible to set up and manage each service.</td>
</tr>
</tbody>
</table>
| User accounts       | It is possible to create and manage user accounts. 
                       | There is only one level of administrative control. A user is either a standard user, either a full rights administrator. |
| Sharing controls    | It is possible to limit the ability to share content outside the company domain (Google Sites, documents, |
videos…). See Figure 7.

<table>
<thead>
<tr>
<th>Branding</th>
<th>It is possible to apply the corporate logo on the applications’ pages. Concerning the colors, we were able to apply corporate colors on the login pages only.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring</td>
<td>It is possible to monitor the use of the services, the usage of user accounts. Reports show activity levels, disk space usage, and active and suspended accounts.</td>
</tr>
<tr>
<td>Security</td>
<td>There is a link to the Postini services console. It is possible to manage some security features: anti-spam, antivirus and retention policies.</td>
</tr>
</tbody>
</table>

**Figure 7**

Google Docs Settings through the Control Panel

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### 3.3.2 Support

Concerning the support provided by Google, the Project Team identified the following support features:

- Google provides helpful online help and training for end users and administrators.
- There is a page providing real-time available status information for Google Apps services (Status Dashboard, see Figure 8).
- Google provides access to support by phone and web. However, some early adopters of Google Apps reported that it was difficult to receive an answer from Google.\(^\text{12}\)

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\(^\text{12}\) http://features.techworld.com/applications/3207690/is-google-apps-good-enough-for-business/
3.3.3 Administration Conclusion

A main Project Team concern is a lack of administrative control granularity. It is not acceptable that country administrators have access to administrate other countries. To avoid allowing too many administrators to have excessive system-wide control, it is necessary to change the business processes concerning the account management. A solution is to centralize the Google Apps administrative tasks. For financial reasons, the administrative team could be located in the Philippines where the company holds operations (see the Provisioning section).

Another concern is the apparently slow response time of Google Apps phone support. A solution is to subscribe, for an extra cost (70,000 USD), to the Premium support. A named Technical Account Manager would be assigned to the company.
4. Operational Aspects

4.1 Current Situation

4.1.1 Messaging Infrastructure

The messaging system of the company uses MS Exchange servers with Outlook clients.

4.1.1.1 The server side

There are 2 data centers (Figure 9), both using MS Exchange 2007:

- One is based in France. It is used by Europe, Africa and Middle East.
- The second is based in the United States. It is used by North America, Latin America, Asia and the Pacific.

![Company Messaging Infrastructure](image)

The data center located in France also hosts the server used for Communicator. It uses Office Communicator Server 2007. The server is used by all regions.

The company has more than 35,000 mailboxes. Half of them are in the USA data center, the other half in the French data center. More than 6000 users use Communicator.

The data center infrastructure and services are fully managed by an external provider. It guarantees:
- A Service Level Agreement (SLA) which defines a mail delivery performance, a fault management and an availability of 99.8%.
- MS Forefront Online Protection for Exchange used as anti-spam and antivirus.
- Two types of quota: Standard (300 MB) and Large (600 MB)
- A backup function
- A tracking function

4.1.1.2 The client side

The computers are managed with SMS (Microsoft Systems Management Server 2003). The following versions are usually installed:

- Windows XP SP3 professional
- Outlook 2003 (Part of Office 2003 SP3)
- Communicator 2005 (on demand)

98% use the Outlook's cache mode. 90% access through the WAN, and 10% have an Internet access: RPC over HTTPS or HTTPS (Outlook Web Access)

4.1.2 Account Provisioning

The following paragraphs describe how user accounts are managed in the company.

The user account architecture is divided into 2 parts (Figure 10): an Active Directory tree that is owned by the company, another one that is owned by an external provider.

The company tree has a domain per region: AMR (Americas), EAME (Europe and Middle East) and APAC (Asia and Pacific). Each domain contains an OU (Organizational Unit) per country.

The user accounts are managed by the IT administrators of the countries.
4.1.2.1 Creating an account

- 1) The administrator creates the user and his privileges in the company Active Directory tree, in the specific domain, in the country Organizational Unit. He sets the Exchange attribute (and if needed the Instant Messaging attribute).
- 2) IIFP (Microsoft Identity Integration Server 2003 Feature Pack) automatically synchronizes the company AD with the external provider AD.
- 3) The external provider AD tree is updated in 20 minutes. The mailbox is created for the user. The following SMTP addresses are generated: firstname.lastname@company.com and firstname_lastname@company.com.

4.2 Integration

4.2.1 Integration Challenges

The integration of Google Apps with the existing IT infrastructure has an important role in the success of the deployment of Google Apps. In order to maintain business productivity, the company applications must communicate with one another. In the company, Google Apps should communicate with the Active Directory, with Sharepoint, and with Exchange (Figure 11).

Some integrating tools will need to be deployed and maintained. The upfront cost to deploy these connectors and the maintenance cost have to be considered in the financial analysis (see the Financial Analysis section).
4.2.2 Integration with Exchange

Thanks to Exchange, users can view their colleagues’ free/busy calendar information. In order to keep this feature in a mixed environment, Google provides an integration tool: Google Calendar Connector\(^{13}\). It allows Google Apps to interoperate with the Exchange servers through the bi-directional sharing of free/busy calendar information.

As this tool needs to be installed in the Exchange environment, the company will assign this task to its external provider.

4.2.3 Active Directory

Google Apps provides a set of integration features for the Active Directory.

Google Apps Directory Sync is a tool to synchronize user accounts in the Active Directory with the Google Apps directory. It is a one-way synchronization tool. A change in the Active Directory is automatically reflected in Google Apps. The tool needs to be installed on a separate server.

It can also be used to automatically provision users and groups based on the user data in the Active Directory.

An advantage of this tool is the Single Sign-On feature. It allows users to authenticate into Google Apps using the existing authentication system. To authenticate users, the server sends requests to the existing Active Directory.

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\(^{13}\) [http://www.google.com/support/a/bin/answer.py?hl=en&answer=33322](http://www.google.com/support/a/bin/answer.py?hl=en&answer=33322)
4.2.4 Integration with Sharepoint

Google Apps cannot communicate directly with Sharepoint. However, the Active Directory synchronizes data with both applications.

We conclude that a drawback of the Active Directory integration tools is that it requires deploying and maintaining a separated dedicated server. However, if Google Apps is adopted, the Project Team recommends deploying the integration options described above.

4.3 Provisioning

Because of the lack of granularity concerning the administration control levels, an administrative team will be in charge of managing the Google Apps accounts for the company worldwide. When an affiliate helpdesk member needs to create an account (or achieve another identity management task, such as a rename, a relocation, a suspension or a deletion), he asks the central administration team to do it. If needed, the administration team will ask Headquarters to transfer the required payment to Google (Figure 12).

4.3.1 Scalability and Elasticity

An advantage of using cloud computing should be the scalability and the elasticity capacities, and the ability to be charged only for used resources.

Concerning Google Apps, besides the fact that the cloud platform scales up or down depending on the load of users working at the same time, it is useful to analyze the ability of adding or removing a large number of users (Table 13).
### Table 13
Scalability and Elasticity Comparison

<table>
<thead>
<tr>
<th>Category</th>
<th>Current solution</th>
<th>Google Apps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required time to increase the number of users</td>
<td>2000 users: 3 months</td>
<td>Immediately</td>
</tr>
<tr>
<td></td>
<td>10,000 users: 6 months</td>
<td></td>
</tr>
<tr>
<td>Ability to remove users (financial aspect)</td>
<td>2000 users: immediately</td>
<td>The company must pay the account fee until the term</td>
</tr>
<tr>
<td></td>
<td>10,000 users: the contract stipulates that the company</td>
<td>(max 1 year)</td>
</tr>
<tr>
<td></td>
<td>must keep a minimum of 30,000 users</td>
<td></td>
</tr>
</tbody>
</table>

Google Apps provides a vast scalability: it is possible to add a large number of users immediately. Currently, the company needs to wait several months. Concerning the ability to remove users, a set of 2000 users for example, it is easier with the current solution, because the current provider charges per month, while Google Apps charges per year.

#### 4.4 Deployment

As described in chapter 2, the deployment of Google Apps consists in adding Google Apps to the company IT portfolio. The country IT managers will be informed that the new solution will be available from a certain date. They will be responsible for providing the solution to their users. The role of the corporate IT managers is to coordinate the deployment.

The required deployment tasks are also described in chapter 2.

To migrate data, the Google Apps Migration for Exchange can be used. It is a server-side tool that migrates email, contacts and calendar data from the Exchange servers to Google Apps.

#### 4.5 Security

With the current system, users’ office documents are stored within the company infrastructure and emails are stored in the external provider environment. If the company uses Google Apps, users’ messages and documents will be stored in Google datacenters. This section describes the security aspects in terms of availability, integrity and confidentiality.
4.5.1 Availability

Availability is an important aspect. A decrease in productivity and revenue losses could be consequences of lack of availability. The Project Team identified the following aspects that reduce the risk of availability issues:

- The SLA guarantees availability 99.9% of the time.
- Data is replicated to secondary data centers in real time. This action ensures safety from data center failures. Moreover, an automated failover capability prevents downtime when individual machines and data centers fail.
- There are no concerns about the provider's viability; Google is an internet leader.

4.5.2 Integrity

The following aspects reduce the risk of an integrity issue:

- Google uses custom-built servers with only the necessary software components, which reduces exploit risks. Furthermore, the homogeneous server architecture enables rapid updates and configuration changes across the entire network when necessary.
- Google makes sufficient server backups to ensure a disaster recovery.

4.5.3 Confidentiality

The following aspects reduce the risk of a confidentiality issue.

Concerning the storage aspect:

- The locations of the data centers are kept discreet. Moreover, access to data centers is limited to only authorized select Google employees.
- Data are fractured and obfuscated across multiple servers and disks, making it human-unreadable.
- With Google Apps, users are less likely to store data locally on unsecured end-points like laptops or thumb drives that can be stolen.

Concerning Google’s privacy policy:

- Google’s privacy policy ensures good privacy, even if it says that they can "reveal user data as required by law or in order to protect their systems".
- Customers retain ownership of data.
- Data retention: After an account is terminated, or when an end-user deletes data in Google Apps, data are deleted from the servers.

Concerning the traffic over the Internet

- Custom information sharing rules are available through the control panel to determine how broadly employees are allowed to share with Google Docs, Google Calendar and Google Sites.
Google provides custom outbound mail filtering tools that prevent sensitive information from being distributed.

Google provides enforced SSL connections to ensure HTTPS access (the SSL option must be enabled in the administrative control panel). They prevent hijacking by protecting the cookie session. However, SSL access is not available for the Start Page and for Google Videos.

### 4.5.4 Other considerations
- Google uses mail filtering tools provided by a service (Postini) having good customer references, such as Merill Lynch.
- Google has the SAS70 Type II certification.

### 4.5.5 Security Concerns
The Project Team identified the following security concerns:

- There is no built-in possibility to force a partner to transfer and deliver emails using the TLS\(^{14}\) protocol over SMTP.
- Data can be stored in any country where Google maintains datacenters. Storing data in the United States is a risk for the company. Indeed, authorities can easily grant access to data.
- In China, the authorities control the internet access. Some sites are completely blocked. Users working with Google services like Google Apps report that the services are sometimes unavailable\(^{15}\).

### 4.5.6 Conclusion on Security
In conclusion, Google provides many security advantages. Availability is apparently high (the pilot will confirm it, in particular for China). Thanks to the distribution of data in several data centers, the disaster recovery capacity also looks high, much higher than in the current situation. The servers built by Google are probably much more difficult to attack than a Windows based server. Our main concern is about the protection given by Google to the company data. How much can the company trust the data protection granted by the contract?

### 4.6 Updates
In contrast with Microsoft Office, there is no need to update Google Apps by deploying service packs or security fixes. The updates are automatically made by Google. An advantage of this method is the time saved for IT administrators. A drawback is that

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\(^{14}\) Transport Layer Security, an network protocol successor to Secure Sockets Layer (SSL)

feature changing can make the end users lose time understanding how the new feature works or, if a feature disappears, finding a way to work differently.

4.7 **Network**

As Google Apps is an online service, the network has an important role for its users. To work efficiently, the network must be reliable and designed to support this cloud computing approach.

4.7.1 **Increased Traffic**

The company network is presently reliable. But if Google Apps is adopted, the network traffic would increase, especially the Internet access. In addition to the current use (for example for messaging, web browsing), Internet will also be used for office work, uploading and downloading files and offline synchronization. Some collaborating features, which can be used by all users, will require even more traffic: file sharing, real time collaboration, voice and video messaging, video sharing.

4.7.2 **Performance Risk**

Because of the increased traffic, performance issues could appear. A slow time response for example would impact end users productivity.

Within the Google Apps cloud, Google provides fast connections between its datacenters. Performance issues are more likely to appear between end users and the datacenters if there are bottlenecks.

4.7.3 **Company Network**

The following figure shows a simplified picture of the current company network architecture. Each country network is linked to the corporate network (WAN). The WAN is connected to the Internet by several access points (Service Integration Points or SIP) around the world: one is located in Europe, one in Asia and one in USA. The company is currently increasing the number of SIP’s.
The SIP’s are potential bottlenecks. They could contribute to a performance problem. Moreover, some countries, such as some African countries, are more likely to suffer from relatively slow response time. Their Internet connection is less direct and generates a higher latency. For those countries, the offline feature of Google Apps can be very useful.

4.7.4 Network Solution

Pilot results will provide an estimation of how many users could adopt Google Apps. With this estimation, the company network team will calculate the traffic increase and provide recommendations on the actions to take concerning the SIPs. Depending on the number of users, they might recommend enlarging the SIPs capacity. These actions will ensure that the WAN infrastructure supports the use of Google Apps without impacting performance.
5. Financial Analysis

**Note:** As the prices that the company negotiated with Microsoft and the external provider are confidential, the amounts in this chapter are intentionally altered. Nevertheless, the approach and method remains valid and applicable to any company who can replace the numbers with their own figures.

### 5.1 Current Solution

The cost of the current Microsoft solution in the company includes the following elements:

- The Microsoft Office licenses cost 200 USD per user per year.
- The archiving cost is 50 USD per user per year.
- The cost of the messaging services managed by the external provider is 100 USD per user per year.
- The support requires 1 Full Time Equivalent (FTE), i.e. 100,000 USD, per 2000 users per year.

### 5.2 New Solution

The cost of the new solution includes the following elements.

#### 5.2.1 Google Apps Licenses

- The price of the Google Apps accounts is 50 USD per user per year for the Premier edition. Google doesn't provide volume discounts.
- An extra cost is required for archiving: 13 USD per user per year.

#### 5.2.2 Support

- The estimate of the cost required to support Google Apps is 1 FTE per 1000 users per year. It includes the administration team in Manila.
- An additional cost is related to the integration aspects in a mixed environment. It includes the required support to maintain the integration tools and manage compatibility issues. Our estimate is
  - 1 FTE per 3000 Google Apps users per year and
  - 1 FTE per 2000 Microsoft users per year.
- The cost of a dedicated Google Technical Account Manager is 70,000 USD per year.

#### 5.2.3 Deployment

- The deployment of Google Apps in the company requires an estimated one-time cost of 100,000 USD. It includes the required training cost and the implementation of the following integration tools: the connector with Exchange (for free/busy information), the connector between
Communicator and Google Talk, the integration with the Active Directory and the Single Sign On feature.

5.3 **Cost Comparison**

Table 14 compares the operational costs of 4 scenarios: the current solution (Microsoft only), Google only and 2 scenarios in a mixed environment. The average cost per user depends of the number of users. The deployment cost is included in the first year.

The following considerations are taken into account:

- Since the slow increase of users from one year to another is not relevant here, the calculations are based on the assumption that the total number of users remains constant (approximately 35,000 users).
- Microsoft Office is not installed on Google Apps users’ computers.
- The cost of instant messaging features is not considered.
- The cost of the network optimization is not considered because the low impact on the cost is not relevant here.
- The cost due to a possible users’ productivity change is not considered.

Table 14:

<table>
<thead>
<tr>
<th>Category</th>
<th>Microsoft only</th>
<th>Google only</th>
<th>Mixed environment (Google 25%)</th>
<th>Mixed environment (Google 75%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licenses</td>
<td>$200</td>
<td>$50</td>
<td>$163</td>
<td>$88</td>
</tr>
<tr>
<td>External messaging</td>
<td>$100</td>
<td>Included</td>
<td>$75</td>
<td>$25</td>
</tr>
<tr>
<td>services</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Archiving</td>
<td>$50</td>
<td>$13</td>
<td>$41</td>
<td>$22</td>
</tr>
<tr>
<td>Support</td>
<td>$50</td>
<td>$35</td>
<td>$48</td>
<td>$39</td>
</tr>
<tr>
<td>Integration</td>
<td>$0</td>
<td>$0</td>
<td>$31</td>
<td>$44</td>
</tr>
<tr>
<td>Deployment</td>
<td>$0</td>
<td>$3</td>
<td>$3</td>
<td>$3</td>
</tr>
<tr>
<td><strong>Total for Year 1</strong></td>
<td><strong>$400</strong></td>
<td><strong>$101</strong></td>
<td><strong>$360</strong></td>
<td><strong>$221</strong></td>
</tr>
<tr>
<td><strong>Total from Year 2</strong></td>
<td><strong>$400</strong></td>
<td><strong>$98</strong></td>
<td><strong>$357</strong></td>
<td><strong>$218</strong></td>
</tr>
</tbody>
</table>
The following chart (Figure 14) shows the average cost per user for the first year for the scenarios described above.

**Figure 14**

*Average cost per user (USD/year)*

In any of the 3 Google scenarios, the cost reduction is appreciable.

### 5.4 Critical Mass

Considering the financial aspects, deploying Google Apps is worthwhile only if a certain number of users adopt it: the critical mass of users. The theoretical critical mass (the one covering the initial expenses) is calculated here.

The following chart (Figure 15) shows the cost per user for Year 1 as a function of the number of users. The theoretical critical mass is the number of users at the point where the cost of the new solution is the same as the current solution.
The "Microsoft Only" line shows the cost per user with the current solution. The "Microsoft in a mixed environment" line shows the cost for a Microsoft user if Google Apps is adopted. The "Google in a mixed environment" line shows the cost of a Google Apps user in a mixed environment. The "Average cost" line shows the average cost of a company user in function of the number of Google Apps users.

The theoretical critical mass is met when 3750 users adopt Google Apps.
5.5 **Savings**

Let us examine the savings for 2 scenarios: For each scenario, a table and a chart are presented.

5.5.1 **Scenario 1**

In this scenario, approximately 10% of the users adopted Google Apps (3550 Google users).

<table>
<thead>
<tr>
<th>Table 15</th>
<th>Savings for Scenario 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average cost per user</td>
<td>Year 1</td>
</tr>
<tr>
<td>$402</td>
<td>$399</td>
</tr>
<tr>
<td>Cumulative savings amount</td>
<td>-$59,550</td>
</tr>
<tr>
<td>Cumulative savings %</td>
<td>-0.42%</td>
</tr>
<tr>
<td>ROI</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 16**

Savings for Scenario 1 (~10% Google Users)

Savings are realized after 2 years.
5.5.2 Scenario 2

In this scenario, 50% of the users adopted Google Apps (17,500 Google users).

Table 16
Savings for Scenario 2

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average cost per user</td>
<td>$291</td>
<td>$288</td>
<td>$288</td>
<td>$288</td>
</tr>
<tr>
<td>Cumulative savings amount</td>
<td>$3,832,500</td>
<td>$7,765,000</td>
<td>$11,697,500</td>
<td>$15,630,000</td>
</tr>
<tr>
<td>Cumulative savings %</td>
<td>37.69%</td>
<td>38.37%</td>
<td>38.60%</td>
<td>38.72%</td>
</tr>
<tr>
<td>ROI</td>
<td></td>
<td></td>
<td></td>
<td>1 year</td>
</tr>
</tbody>
</table>

Figure 17
Savings for Scenario 2 (50% Google Users)

Savings are realized after 1 year.

Depending of the number of Google Apps users, important savings can be realized. We must take into account the deployment cost and the costs due to a mixed Google-Microsoft environment. They include the deployment and maintenance of integration tools and the management of compatibility issues.
6. Human Factors

This section identifies the main human factors that can influence the decision to adopt Google Apps. These factors can be objective or subjective, rational or irrational, conscious or unconscious. Besides the defined success criteria, there are a number of factors that can influence positively or negatively the stakeholders. These factors can have important implications in the decision making process. Depending on the factors, certain actions should be taken in order to prevent a decision based on irrational aspects that could turn out to be a mistake.

The text below lists factors classified in categories, the influence they can have on stakeholders depending on their perception, and, when available, the required actions to take.

6.1 Contractual Aspects

The lengthy process to agree on the contract can influence the Project Team and the decisional people. They can be disappointed by the slow reaction time of Google. It is important to evaluate during the pilot how fast Google manages the company’s requests. Furthermore, Google’s respect of the contract will have an influence. The Project Team will give particular attention to respect of the availability promised by Google.

6.2 Business Requirements

With Google Apps, it is possible that some current business requirements are not met. The CIO can be influenced by this aspect. He may worry about extra costs to achieve compliance, or the possible impact of different requirements. The Project Team will provide a complete list of business requirements that cannot be met with Google Apps in order to arrive at an objective decision.

6.3 Financial Aspects

The CIO is concerned about the cost of the solution. The Project Team will provide a financial analysis showing the possible savings depending on the number of Google Apps users. As the way it is presented can have an influence, the Project Team will provide an objective and realistic report.

The country managers will be interested in deploying Google Apps to their users only if they are informed and convinced of the benefits. Thus, it is important to announce to
them before deployment that Google Apps will be available, for which category of users it is recommended, and what savings can be had. Furthermore, in the cross charging process, savings must be obvious.

The **end users** could be frustrated by receiving a cheaper solution. The perceived quality of a product can be proportional to its price\(^\text{16}\). It will be important to communicate the advantages the solution provides them, such as the collaboration features.

### 6.4 Support

If Google Apps requires a lot of support during the pilot, helpdesks and end users will be negatively influenced.

Concerning the **helpdesks**, it is important to provide them with clear instructions on how to set up the pilot users accounts (Helpdesk Welcome Package\(^\text{17}\)). Concerning the **end users**, another Welcome Package will show them how to start using Google Apps and where to find help\(^\text{18}\). Furthermore, web conference training will be provided at the beginning of the pilot. Training and documentation will also be provided if Google Apps is deployed.

In order to provide effective answers to helpdesk requests, a support escalation process must be planned.

### 6.5 Security

The term “cloud computing” can be scary for all stakeholders. They might fear that confidentiality is an issue because the information isn’t stored in a known central place as before. It will be very important to reassure them on the confidentiality provided by Google. Moreover, we recommend avoiding the word “cloud” when communicating with stakeholders.

### 6.6 User Satisfaction

Advanced users might suffer from the fact that many advanced MS Office features are not available in Google Apps. The Project Team must provide a segmentation report

\(^{17}\) See Annex 2  
\(^{18}\) See Annex 1
showing which user categories are good candidates to move to Google Apps. It is also important to highlight the features that can bring new business opportunities, such as the collaboration features. The help documentation and training are important.

A factor that can help the introduction of Google Apps is previous experience. The employees are often familiar with GMail, because they use it in a private context.

6.7 Google

The image that end users have of Google can influence their motivation in adopting Google Apps. For many users, Google now has a good image as an Internet leader and friendly search engine. However, an event, such as a revelation concerning an unethical attitude of Google, could reverse their perception. Others could be reticent at the outset in view of the growing power of that company.

For the CIO, having a solution next to Microsoft is appealing. It can decrease the company dependency on Microsoft. Moreover, the adoption of Google Apps could give a modern, innovative image of the company.

6.8 Change Management

Fear and resistance to change may characterize some end users’ attitudes. Reasons include the fear of loss, the non-understanding of the change and its implications, and the difficulty of coping with the new solution. In addition, the CIO may fear that the users will become less productive when changing to the new solution. Once again, showing the benefits of the new solution and providing enough training will facilitate the change.
Conclusion

The GAPS Project has enabled us to evaluate the advantages and disadvantages to the company of replacing Microsoft Office by Google Apps.

Many advantages have been found. Google Apps offers collaboration features which can lead to new business opportunities, such as real time editing and the ability to share a document with an external partner. The messaging service allows users to save time, thanks to the large storage capacity and to the well organized mailboxes. The licenses are less expensive than those of Microsoft. Google Apps can be made available to the contractors, as they don’t require tools other than a messaging service.

However, one should not recommend the adoption of Google Apps to some types of users. Advanced users would suffer from the lack of functionality and from compatibility issues, especially when opening Microsoft Office documents with rich content; frequent travelers and users in locations with unreliable Internet connections would be less productive. Among the disadvantages, we note that a central administration team needs to be created, as the administrative control panel doesn’t offer any granularity.

In order to take a decision on the possible adoption of Google Apps, the Project steps, as described in this document, should be followed. In particular, the company should conduct a pilot. The results will provide a classification of the users according to the ability of Google Apps to meet their requirements. Depending of the potential number of Google Apps users, important savings can be realized as described in the financial analysis, taking into account the costs due to a mixed Google-Microsoft environment.

We conclude that overall the Project brings an added value to the company in the sense that having an alternative solution decreases the dependency to Microsoft. Furthermore, having other solutions in hand increases the company agility. We also conclude that it is necessary to periodically evaluate the continuously changing IT world by conducting projects such as the GAPS Project. This will ensure the long-term sustainability of IT activities, with the ability to anticipate changes and to choose the best IT solutions for the company.
Glossary

AD | Active Directory, a component of Microsoft Windows that provides distributed user management and authentication.

CIO | Chief Information Officer

Cloud Computing | Internet-based computing, whereby shared resources, software and information are provided to computers and other devices on-demand. Cloud computing is broken down into three segments: "applications," "platforms," and "infrastructure."

Cookie | A message passed from a web server to a web browser which is stored on the user's local hard drive in a small text file.

E-discovery | Refers to any process in which electronic data is sought, located, secured, and searched with the intent of using it as evidence in a civil or criminal legal case.

Elasticity | The ability of a system to dynamically acquire or release compute resources on demand.

GAPS | Google Apps Premier Start Project

GMail | Email service provided by Google.

Hijacking | A security attack on a user session over a protected network

IIFP | Microsoft Identity Integration Server 2003 Feature Pack, a tool providing synchronization between AD and Exchange servers.

IT Council | Group consisting of business IT managers, regional IT managers and corporate IT representatives. The IT Council coordinates the IT initiatives in the company.

JavaScript | Client-side scripting language.

Pilot | Small-scale test-plant commissioned or initiated to check the conditions and operational details before full scale launch.

Postini | E-mail and Web security and archiving service owned by Google since 2007.

SaaS (Software as a Service) | Software distribution model Service in which applications are hosted by a service provider and made available to the end-user over the network, without requiring him to run the application on his own computer.

Scalability | The ability of a computing system to grow relatively easily in response to increased demand

SharePoint | Microsoft SharePoint is a collection of products and software elements that includes web browser-based collaboration functions.

SLA | A service-level agreement (SLA) is a contract between a network service provider and a customer that specifies, usually in measurable terms, what services the network service provider will furnish.

SMS | Systems Management Server, a Microsoft product to manage remotely Microsoft-based computer systems.

SMTP | Simple Mail Transfer Protocol, a protocol for sending e-mail messages between servers.
SSL  Secure Sockets Layer, a protocol that provides secure communications on the Internet.
TSL  Transport Layer Security, a network protocol successor to SSL.
References


SCHADLER, Ted. Tier Your Workforce To Save Money With Cloud-Based Corporate Email. Forrester Research, 2009.


Annex 1
Welcome Package for End Users
Annex 2
Welcome Package for HelpDesks
<table>
<thead>
<tr>
<th>Main category</th>
<th>Subcategory</th>
<th>Subject</th>
<th>No.</th>
<th>Affirmation</th>
<th>Comment</th>
<th>Rating</th>
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<tbody>
<tr>
<td>OVERALL</td>
<td>OVERALL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Usability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intuitiveness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Availability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Online help</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FUNCTIONALITY</td>
<td>EMAIL</td>
<td>Set of features</td>
<td>17</td>
<td>I can perform 100% of my messaging tasks with Gmail.</td>
<td>Which features do you miss?</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Virus filtering</td>
<td>8</td>
<td>I didn't receive any virus.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spam filtering</td>
<td>9</td>
<td>I didn't receive any spam.</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Labels</td>
<td>10</td>
<td>I can easily access and manage my messages and labels.</td>
<td></td>
<td></td>
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<tr>
<td>GOOGLE DOCS</td>
<td>Set of features - Docs</td>
<td>11</td>
<td>I can perform 100% of my office tasks with Google Docs.</td>
<td>Which features do you miss?</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Text Documents</td>
<td>12</td>
<td>It's comfortable for me to work with a text document.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Text Documents - Formatting</td>
<td>13</td>
<td>It's easy for me to format.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Text Documents - Spellchecker</td>
<td>14</td>
<td>I am satisfied with the spellchecker.</td>
<td></td>
<td></td>
<td></td>
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<td>Spreadsheets</td>
<td>15</td>
<td>It's comfortable for me to work with a spreadsheet.</td>
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<td></td>
<td></td>
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<td></td>
<td>Spreadsheets - tables</td>
<td>16</td>
<td>I can easily create a table.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Spreadsheets - functions</td>
<td>17</td>
<td>I can easily add formulas and functions.</td>
<td></td>
<td></td>
<td></td>
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<td>Presentations</td>
<td>18</td>
<td>I can easily add and format slides.</td>
<td></td>
<td></td>
<td></td>
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<td>Presentations - contents</td>
<td>19</td>
<td>I can easily add information and images.</td>
<td></td>
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<tr>
<td></td>
<td>Presentations - formatting</td>
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<td>I can create and format my presentations.</td>
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<tr>
<td></td>
<td>Collaboration - sharing</td>
<td>21</td>
<td>I can easily share a document with someone else.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Collaboration - editing</td>
<td>22</td>
<td>It's useful to have the possibility to work on the same document at the same time.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>Printing</td>
<td>23</td>
<td>I can print my work easily.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Compatibility Microsoft - Google</td>
<td>24</td>
<td>It's easy to work with an uploaded document made with Microsoft Office.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>GOOGLE SITES</td>
<td>Google Sites</td>
<td>25</td>
<td>I can easily create a site.</td>
<td></td>
<td></td>
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<td></td>
<td>Google Sites - Sharing</td>
<td>26</td>
<td>I can easily give permissions to others to view or edit the site.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Instant Messaging - voice</td>
<td>27</td>
<td>Using Google Talk is comfortable for me.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Instant Messaging - video</td>
<td>28</td>
<td>Using Google Talk with voice and video is comfortable for me.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OFFLINE</td>
<td>Offline - Gmail</td>
<td>29</td>
<td>I can easily work with Gmail offline.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Offline - calendar</td>
<td>30</td>
<td>I can easily work with the calendar offline.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTHER</td>
<td>Migration</td>
<td>31</td>
<td>It's easy to move to the new user interface.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Set up</td>
<td>32</td>
<td>The setup is easy and quick.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>MOBILE</td>
<td>Mobile (data synchronization)</td>
<td>33</td>
<td>I am satisfied using my mobile phone for messaging.</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>SHAREPOINT</td>
<td>SharePoint</td>
<td>34</td>
<td>I can easily work with resources on SharePoint sites.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BENEFITS</td>
<td>Benefits</td>
<td>35</td>
<td>What is better with Google Apps compared to the solutions in place?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
<td>36</td>
<td>I can use Gmail as a replacement of Outlook.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

End Users Feedback Survey
## Annex 4

### Google Apps Editions Comparison

<table>
<thead>
<tr>
<th></th>
<th>Standard Edition</th>
<th>Premier Edition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Price</strong></td>
<td>Free</td>
<td>50$/user/year</td>
</tr>
<tr>
<td>Maximum users</td>
<td>50</td>
<td>none</td>
</tr>
<tr>
<td>Email storage per user</td>
<td>7GB</td>
<td>25GB</td>
</tr>
<tr>
<td><strong>User applications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gmail</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Google Calendar</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Google Docs</td>
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<td>Yes</td>
</tr>
<tr>
<td>Google Sites</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Google Video</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Google Groups</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Business features</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BlackBerry interoperability</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>MS Outlook interoperability</td>
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<td>Yes</td>
</tr>
<tr>
<td>Gmail ads turn-off option</td>
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<td>Yes</td>
</tr>
<tr>
<td>Email delegation</td>
<td>No</td>
<td>Yes</td>
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<td>Calendar resource scheduling</td>
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<td>Yes</td>
</tr>
<tr>
<td>Docs domain templates</td>
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<tr>
<td><strong>Business Controls</strong></td>
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<td>SSO</td>
<td>No</td>
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</tr>
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<td>Forced SSL</td>
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</tr>
<tr>
<td>Custom password</td>
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<tr>
<td><strong>Business support and reliability</strong></td>
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</tr>
<tr>
<td>99.9% uptime guarantee SLA</td>
<td>No</td>
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</tr>
<tr>
<td>24/7 support</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Administrative tools</strong></td>
<td></td>
<td></td>
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<tr>
<td>Email migration</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>Directory sync with LDAP</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Email routing and gateway</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>User provisioning API</td>
<td>No</td>
<td>Yes</td>
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### Annex 5
#### Project Tasks List

<table>
<thead>
<tr>
<th>PHASE</th>
<th>Task category</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PROJECT</strong></td>
<td><strong>ELABORATION</strong></td>
<td>Examine the Google Apps offering</td>
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<td></td>
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<td>Examine Google Apps features</td>
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<td></td>
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<td>Discuss with Google Apps early adopters</td>
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<td></td>
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<td>Find Google Apps integration partners</td>
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<td></td>
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<td>Create Google company domain</td>
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<td></td>
<td>Assess the company environement</td>
<td>Configure Google Apps through the administration panel</td>
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<td>Test with 4 users</td>
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<td>Prepare integration</td>
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<td></td>
<td>Customize and assess contract</td>
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<td></td>
<td>Finalize contract</td>
<td>Upgrade to Premier edition</td>
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<td></td>
<td>Company - Google</td>
<td>Test Premier edition</td>
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<tr>
<td><strong>PILOT</strong></td>
<td>Prepare the pilot</td>
<td>Pilot users enrollment</td>
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<tr>
<td></td>
<td></td>
<td>Define success criteria</td>
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<td>Create accounts</td>
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<td></td>
<td>Create User Welcome Package</td>
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<td>Create Helpdesk Welcome Package</td>
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<td></td>
<td>Create User feedback survey</td>
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<td>Create Helpdesk feedback survey</td>
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<td></td>
<td>Create corporate templates</td>
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<td></td>
<td>Inform helpdesks</td>
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<td></td>
<td></td>
<td>Organize a training</td>
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<td></td>
<td>Run the pilot</td>
<td>Distribute users' credentials</td>
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<td>Support local helpdesks</td>
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<td></td>
<td>Evaluate the pilot</td>
<td>Distribute surveys</td>
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<td>Analyse survey results</td>
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<td>Decommission the pilot</td>
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<td>Create user segmentation report</td>
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<td>Create cost analysis</td>
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<td>Create impact analysis</td>
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<td>Create recommendations</td>
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<td></td>
<td></td>
<td>Make a decision (CIO)</td>
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<tr>
<td><strong>DEPLOYMENT</strong></td>
<td>Prepare the deployment</td>
<td>Elaborate the procedures</td>
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<tr>
<td></td>
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<td>Purchase a dedicated Google support contact</td>
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<td>Plan the rollout</td>
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<td>Create the administration team</td>
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<td>Inform Country Managing Directors and Country IT Managers</td>
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<td></td>
<td></td>
<td>Inform helpdesks</td>
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<tr>
<td>Launch Google Apps</td>
<td>Inform Country IT Managers</td>
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<tr>
<td>Evaluate the deployment process</td>
<td>Evaluate the deployment's process</td>
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<tr>
<td>Calculate the return on investment</td>
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<tr>
<td>Monitor the operating aspects and the use of Google Apps</td>
<td>Organize a feedback survey for end users and support staff after using Google Apps for a month</td>
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<tr>
<td>Verify the operating status of Google Apps services.</td>
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<td>Provide the necessary documentation or training</td>
<td>Track and anticipate Google Apps changes</td>
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<td>Organize regular feedback to a selection of end users and support</td>
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