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**Service Organization Controls (SOC) 3 Report**

**Report on the G Suite, Other Google Services and  
Supporting Services System**

**Relevant to Security, Availability, Processing Integrity, and  
Confidentiality**

**For the Period 1 May 2016 to 30 April 2017**

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**Management's Assertion Regarding the Effectiveness of Its Controls  
Over the G Suite, Other Google Services and Supporting Services System  
Based on the Trust Services Principles and Criteria for Security, Availability,  
Processing Integrity, and Confidentiality**

30 June 2017

We, as management of, Google Inc. ("Google") are responsible for designing, implementing and maintaining effective controls over the G Suite, Other Google Services and Supporting Services System (System) to provide reasonable assurance that the commitments and system requirements related to the operation of the System are achieved.

There are inherent limitations in any system of internal control, including the possibility of human error and the circumvention of controls. Because of inherent limitations in Security controls, an entity may achieve reasonable, but not absolute, assurance that all security events are prevented and, for those that are not prevented, detected on a timely basis. Examples of inherent limitations in an entity's Security's controls include the following:

- Vulnerabilities in information technology components as a result of design by their manufacturer or developer
- Ineffective controls at a vendor or business partner
- Persistent attackers with the resources to use advanced technical means and sophisticated social engineering techniques specifically targeting the entity

We have performed an evaluation of the effectiveness of the controls over the system throughout the period 1 May 2016 to 30 April 2017, to achieve the commitments and system requirements related to the operation of the System using the criteria for the security, availability, processing integrity, and confidentiality (Control Criteria) set forth in the AICPA's TSP section 100A, *Trust Services Principles and Criteria for Security, Availability, Processing Integrity, Confidentiality, and Privacy*. Based on this evaluation, we assert that the controls were effective throughout the period 1 May 2016 to 30 April 2017 to provide reasonable assurance that:

- the System was protected against unauthorized access, use, or modification to achieve Google's commitments and system requirements
- the System was available for operation and use, to achieve Google's commitments and system requirements
- the System processing is complete, valid, accurate, timely, and authorized to achieve Google's commitments and system requirements
- the System information is collected, used, disclosed, and retained to achieve Google's commitments and system requirements

based on the Control Criteria.



Our attached description of the boundaries of the G Suite, Other Google Services and Supporting Services System identifies the aspects of the G Suite, Other Google Services and Supporting Services System covered by our assertion.

Very truly yours,

**GOOGLE Inc.**



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## Report of Independent Accountants

To the Management of Google Inc.:

### Approach:

We have examined management's assertion that Google Inc. ("Google") maintained effective controls to provide reasonable assurance that:

- the G Suite, Other Google Services and Supporting Services System was protected against unauthorized access, use, or modification to achieve Google's commitments and system requirements
- the G Suite, Other Google Services and Supporting Services System was available for operation and use to achieve Google's commitments and system requirements
- the G Suite, Other Google Services and Supporting Services System processing is complete, valid, accurate, timely, and authorized to achieve Google's commitments and system requirements
- the G Suite, Other Google Services and Supporting Services System information is collected, used, disclosed, and retained to achieve Google's commitments and system requirements

during the period 1 May 2016 through 30 April 2017 based on the criteria for security, availability, processing integrity, and confidentiality in the American Institute of Certified Public Accountants' TSP Section 100A, *Trust Services Principles and Criteria, for Security, Availability, Processing Integrity, Confidentiality, and Privacy*. This assertion is the responsibility of Google's management. Our responsibility is to express an opinion based on our examination.

Our examination was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants. Those standards require that we plan and perform our examination to obtain reasonable assurance about whether management's assertion is fairly stated, in all material respects. An examination involves performing procedures to obtain evidence about management's assertion, which includes:

- (1) obtaining an understanding of Google's relevant security, availability, processing integrity and confidentiality policies, processes and controls,
- (2) testing and evaluating the operating effectiveness of the controls, and
- (3) performing such other procedures as we considered necessary in the circumstances.

The nature, timing, and extent of the procedures selected depend on our judgment, including an assessment of the risk of material misstatement, whether due to fraud or error. We believe that the evidence obtained during our examination is sufficient and appropriate to provide a reasonable basis for our opinion.



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Our examination was not conducted for the purpose of evaluating Google's cybersecurity risk management program. Accordingly, we do not express an opinion or any other form of assurance on its cybersecurity risk management program.

**Inherent limitations:**

There are inherent limitations in the effectiveness of any system of internal control, including the possibility of human error and the circumvention of controls. Because of inherent limitations in its internal control, those controls may provide reasonable, but not absolute, assurance that its commitments and system requirements related to security, availability, processing integrity and confidentiality are achieved.

Examples of inherent limitations of internal controls related to security include (a) vulnerabilities in information technology components as a result of design by their manufacturer or developer; (b) breakdown of internal control at a vendor or business partner; and (c) persistent attackers with the resources to use advanced technical means and sophisticated social engineering techniques specifically targeting the entity. Furthermore, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions or that the degree of compliance with the policies or procedures may deteriorate.

**Opinion:**

In our opinion, Google's management assertion referred to above is fairly stated, in all material respects, based on the aforementioned criteria for security, availability, processing integrity and confidentiality.

*Ernst & Young LLP*

30 June 2017



## System Description of the G Suite, Other Google Services and Supporting Services

### Google Overview

Google Inc. (“Google”) is a global technology service provider focused on improving the ways people connect with information. Google’s innovations in web search and advertising have made Google’s web site one of the most viewed Internet destinations and its brand among the most recognized in the world. Google maintains one of the world’s largest online index of web sites and other content, and makes this information freely available to anyone with an Internet connection. Google’s automated search technology helps people obtain nearly instant access to relevant information from their vast online index.

Google offers Internet-based services and tools that user entities can access to communicate, collaborate, and work more efficiently. The following Google product offerings automatically save all work performed by user entities in the cloud and enable user entities to work securely, regardless of where they are in the world and what device they are using.

The following are the services hereafter collectively described as “G Suite”:

	<b>G Suite Core Services</b>	<b>G Suite Basic</b>	<b>*G Suite Business</b>	<b>G Suite Business (Team Managed)</b>	<b>G Suite for Education</b>
Gmail	✓	✓	✓		✓
Calendar	✓	✓	✓		✓
Classroom	✓				✓
Contacts	✓	✓	✓		✓
Docs	✓	✓	✓	✓	✓
Drive	✓	✓	✓	✓	✓
Forms	✓	✓	✓	✓	✓
Groups	✓	✓	✓		✓
Hangouts	✓	✓	✓	✓	✓
Sheets	✓	✓	✓	✓	✓

	<b>G Suite Core Services</b>	<b>G Suite Basic</b>	<b>*G Suite Business</b>	<b>G Suite Business (Team Managed)</b>	<b>G Suite for Education</b>
Sites	✓	✓	✓		✓
Classic Sites	✓	✓	✓		✓
Slides	✓	✓	✓	✓	✓
Talk	✓	✓	✓		✓
Tasks		✓	✓		✓
Vault	✓	✓	✓		✓
Admin Console		✓	✓		✓
Apps Script		✓	✓		✓
G Suite Admin SDK		✓	✓		✓
G Suite Product APIs		✓	✓		✓
Inbox by Gmail	✓	✓	✓		✓
Cloud Search	✓	✓	✓		
Keep	✓	✓	✓		✓
Hangouts Chat	✓	✓	✓		
Hangouts Meet	✓	✓	✓		✓
Google+	✓	✓	✓		

\*G Suite Business is the premium version of G Suite Basic. In addition to everything available in G Suite Basic, it includes unlimited storage space and Vault for everyone in the user's organization. It also offers additional Google Drive administration, auditing, and reporting features.



Google social and communication services, hereafter described collectively as “Other Google Services”, include:

- Google Now
- Google+
- Chrome Sync
- Chrome Device Management
- App Maker
- Cloud Identity
- Jamboard

Google supporting services and dependencies, hereafter described collectively as “Supporting Services”, include:

- Gmail Delivery
- Gmail Frontend / Middleware
- Gmail Medley
- Gmail Spam

Google’s product offerings including G Suite, Other Google Services and Supporting Services provide the unique advantage of leveraging the resources of Google’s core engineering team while also having a dedicated team to develop solutions for the corporate market. As a result, these Google offerings are positioned to innovate at a rapid rate and provide the same level of service that users are familiar with on google.com.

G Suite, Other Google Services and Supporting Services are targeted to small and medium businesses and large corporations alike. These products provide what business organizations typically require, including the following:

- Multi-user collaboration
- No special hardware or software required by the enterprise
- Security and compliance features
- Seamless upgrades

The products are comprised of communication, productivity, collaboration and security tools that can be accessed from virtually any location with Internet connectivity. This means every employee and each user entity they work with can be productive from anywhere, using any device with an Internet connection.

The G Suite, Other Google Services and Supporting Services covered in this system description consist of the following services:

### *Gmail*

Gmail is a cloud-based email service providing web browser and mobile interfaces. Gmail provides customizable email addresses which include the user entity’s own domain, mail search tools and integrated chat. Users can compose and manage email, filter for spam and viruses. It is fully integrated with other Google services such as Calendar, Groups, Google+ and Drive.





### *Calendar*

Calendar is a cloud-based calendaring service providing web browser and mobile interfaces. Calendar is an application that enables individuals and corporations to coordinate and schedule people, meeting rooms and other resources. Users can create events, send invitations, share schedules and track RSVPs. It is fully integrated with other Google services such as Gmail, Drive, Google+ and Hangout.

### *Classroom*

Classroom is cloud-based school communication and assignment management tool. It allows users to create and join classroom groups as teachers and students, distribute and grade assignments as a teacher, or view and submit assignments as a student. Classroom is only available to G Suite for Education users.

### *Contacts*

Contacts is a cloud-based contacts service providing web browser and mobile interfaces. It allows users to import, store and organize contact information about people and businesses with whom they communicate. Not only can each contact contain basic information such as names, email addresses and phone numbers, they can also include extended information like physical address, employer, department or job title. Users can also create personal groups of contacts to email many people at once. It is fully integrated with other Google services such as Gmail, Drive, Google+ and Groups.

### *Docs*

Docs is an online word processor that lets users create and format text documents and collaborate with other users in real time. Documents can be private or shared, and multiple people can edit the same document at the same time. Comments can also be left in the document, and documents can be exported to other file formats.

### *Drive*

Drive is a cloud-based storage solution, where users can create, share, collaborate and keep their files. It provides the sharing controls for files and folders, including Google Docs, Sheets and Slides, as well as any other file type. Drive comes with desktop and mobile apps, making it much easier to upload, synchronize and access files from any device. It is fully integrated with other Google services such as Groups, Hangouts and Gmail.

### *Forms*

Forms is an online data collection tool that lets users collaboratively build and distribute surveys, polls and quizzes. Forms provides real-time analysis of structured form response data through integration with Google Sheets.

### *Groups*

Groups is a cloud-based rostering service providing web browser and mobile interfaces. It allows online creation and management of user groups. Groups users can engage in discussions about a specific subject; organize meetings, conferences or social events among members of a group; find people with similar hobbies, interests or background; share file and calendar events; read groups posts through email, the online interface or both; and more. It is fully integrated with other Google services such as Gmail, Drive, and Calendar.

### *Hangouts*

Hangouts is a real-time communication and messaging application that allows users to send and receive messages, photos and videos and make one-to-one and group video calls of up to 25 users at a time. It is available on mobile and desktop devices and is fully integrated with Google products such as Gmail, Drive, Google+ and Calendar.

### *Sheets*

Sheets is an online spreadsheet application that lets users create and format spreadsheets and simultaneously work with other users. Spreadsheets can be private or shared, and multiple people can edit the same spreadsheet at the same time. Comments can also be left in the spreadsheet, and spreadsheets can be exported to other file formats.

### *Sites*

Sites is a cloud-based publishing service providing web browser and mobile browser interfaces. It allows the creation of site pages to share and collaborate on documents, videos, schedules and more. It can be published as an internal or an external facing web site. It is fully integrated with other Google services such as Drive and Groups.

### *Classic Sites*

Classic Sites is a cloud-based publishing service providing web browser and mobile browser interfaces. It allows the creation of site pages to share and collaborate on documents, videos, schedules and more. It can be published as an internal or an external facing web site. It is fully integrated with other Google services such as Drive and Groups.

### *Slides*

Slides is an online presentation application that allows users to show off their work in a visual way and present to audiences. Presentations can be private or shared, and multiple people can edit the same presentation at the same time. Comments can also be left in the presentation, and presentations can be exported to other file formats.

### *Talk*

Talk is an application that enables text, video and voice communications. Users can initiate a chat, invite friends to a chat and place phone calls to any landline or mobile phone number included in Gmail contacts.

### *Tasks*

Tasks is an online application that allows users to create task lists and tasks. It is integrated with Gmail and the Google Calendar applications.

### *Vault*

Vault is corporate solution that provides additional storage and searching tools to manage critical information and preserving important corporate data. Vault helps protect user entities with easy-to-use searches so they can quickly find and preserve data to respond to unexpected customer claims, lawsuits or investigations during the electronic discovery (eDiscovery) process. Additionally, Vault gives G Suite user entities the extended management and information governance capabilities to proactively archive, retain and preserve Gmail and on-the-record chats. With the ability to search and manage data based on terms, dates, senders, recipients and labels, Vault helps user entities find the information they need, when they need it.

### *Admin Console*

Admin Console, formerly Google Apps Admin Console, is a cloud-based user and device administrative service used to configure the different applications, perform user management, utilize admin tools, etc. Users can initiate transactions such as creating user accounts to give users access to various G Suite services, and managing Google services settings.

### *Apps Script*

Apps Script is a JavaScript cloud scripting language that provides easy ways to automate tasks across Google products and third party services. Users can define the set of transactions their scripts can initiate and process.

### *G Suite Admin SDK*

The Administrative Tools for G Suite within the Admin Software Development Kit (“SDK”) are used to manage users, groups, devices and apps, create custom usage reports and migrate email and groups to G Suite.

- [Admin Settings API](#)

The Admin Settings Application Program Interface (“API”) allows administrators of G Suite domains to retrieve and change the settings of their domains in the form of Google Data API feeds. These domain settings include many of the features available in the Admin Console.

- [Directory API](#)

G Suite and reseller administrators can use the Directory API to manage Mobile and Chrome OS devices, groups, group aliases, members, organizational units, users and user aliases.



- Domain Shared Contacts API

The Domain Shared Contacts API allows client applications to retrieve and update external contacts that are shared to all users in a G Suite domain.

- Email Audit API

The Email Audit API allows G Suite administrators to audit a user's email, email drafts and archived chats.

- Calendar Resource API

The Calendar Resource API allows Google Apps administrators to retrieve and manage the Google Calendar resources of their domains in the form of Google Data API feeds.

- Email Settings API

The Email Settings API allows website administrators to offer their users co-branded versions of a variety of personalized Google applications, such as Google mail.

- Groups Migration API

The Groups Migration API lets account-level administrators migrate emails from public folders and distribution lists to Google Groups discussion archives.

- Groups Settings API

The Groups Settings API allows account-level administrators to manage the group settings for their G Suite account.

- Enterprise License Manager API

The Enterprise License Manager API allows administrators to assign, update, retrieve and delete user licenses.

- Reports API

The Reports API lets the account administrators to customize usage reports

- Reseller API

The Reseller API can be used by authorized reseller administrators and reseller's service integrators to place customer orders and manage G Suite monthly post-pay subscriptions.

- SAML-based SSO API

SAML-based Single Sign-On (“SSO”) service provides partner companies with full control over the authorization and authentication of hosted user accounts that can access web-based applications like Gmail or Google Calendar.

### *G Suite Product APIs*

- Gmail REST API

The Gmail REST API is a RESTful API that can be used to access Gmail mailboxes and send mail. For most web applications (including mobile apps), the Gmail API is the best choice for authorized access to a user's Gmail data for G Suite users.

- Drive REST API

The Drive REST API is a RESTful API that can be used to Create, Open, Search, and Share contents in Google Drive for G Suite users.

- Calendar API

The Calendar API is a RESTful API that allows client applications to access and edit Google Calendar data for G Suite users.

- Contacts API

The Contacts API can be used to create new contacts, edit or delete existing contacts and query for contacts that match particular criteria for G Suite users.

- Tasks API

The Tasks API provides access for searching, reading and updating Google Tasks content and metadata for G Suite users.'

- Sites API

The Sites API allows client applications to access, publish, and modify content within a Google Site, create and delete sites. The API is available to both Google Account and G Suite users.

- Sheets API

The Sheets API enables developers to create applications that read and modify the data in Google Sheets.

- Apps Activity API

The Apps Activity API allows client applications to retrieve information about a user's G Suite activity. Currently, the API supports retrieving activity from the Google Drive



service regarding changes to a user's Google Drive files. This provides additional functionality on top of the existing Drive API for an app to perform tasks such as displaying activity on a user's files, tracking changes to specific files or folders and alerting a user to new comments or changes to files.

### *Inbox by Gmail*

Inbox by Gmail is the next generation Gmail inbox designed to help people keep track of everything they need to get back to at a later time. It is available on Android, iOS and web.

### *Cloud Search*

Cloud Search is a cloud-based service providing search and assist capabilities across our Google Apps for Work customers. Cloud Search will provide users in the workplace a place to ask questions and get proactive assistance. Cloud Search integrates with the applications you use – both first- and third-party. It is fully integrated with other Google services such as Gmail, Drive, Calendar, and Groups.

### *Keep*

Keep is a cross-platform product for taking notes to capture ideas, auto-organize them, and suggest actions to get things done. Keep can help record to do items, make lists, record audio notes, or take photos. Reminders can be added to remind the user of a note at a certain time or place. It syncs across all devices so it's accessible wherever the user is.

### *Hangouts Chat*

Hangouts Chat is a cloud-based cross-platform enterprise communication product. This product provides real-time persistent channels giving the team a central place to discuss specific topics. Textual chat will be threaded to help organize discussion. Productivity content like Docs, Keep Notes, and Calendar events will be seamlessly embedded allow users to interact with items from within the conversation.

### *Hangouts Meet*

Hangouts Meet is a new meetings experience that redesigns the 'at work' meeting experience over real-time video. It employs the technology in Hangouts multi-way video calls in a form targeted for the enterprise. The new meeting experience includes a new visual design for web, meeting rooms (Chromebox for meetings) and mobile (iOS and Android) amongst several other features.

### *Google+*

Google+ is a social networking platform that is fully integrated with other Google products. Users create and are able to manage their own Google+ profile. Google+ allows users to create and share content with each other. It also enables users to select and organize people into groups for optimal sharing across various Google products and services.



### *Google Now*

Google Now provides personalized and contextual suggestions and recommendations via mobile, desktops and wearable devices. Google Now delivers customized and highly relevant information users care about automatically based on the settings they choose. Simple cards bring the information such as weather, traffic and stock prices that users want to help manage the users' day.

### *Chrome Sync*

Chrome Sync is a service that synchronizes Chrome browser data with Google servers, allowing users who are signed into Chrome to maintain the same browsing experience across devices. It uses real time updates to allow signed-in users to use and modify bookmarks, passwords, settings, and other data across any device running Chrome Browser.

### *Chrome Device Management*

Chrome Device Management is a license based administrative console that allows enterprise administrators to manage Chrome devices in their domain from a single place. It allows for admins to configure Chrome features for users, set up device access to VPNs and Wi-Fi, force install Chrome apps and extensions, etc., and apply configurations to specific groups of users, or to the entire organization.

### *App Maker*

App Maker is a cloud-based low code application development tool that lets organizations quickly build and deploy custom apps tailored to their needs. Apps built with App Maker are run on the same secure and scalable platform that powers G Suite apps such as Gmail, Drive and Docs.

### *Cloud Identity*

Cloud Identity offers identity management capabilities to customers. This services is primarily a standalone offering that enables identity management for the cloud. The service offers single sign-on ("SSO"), provisioning, directory administration, multi-factor authentication, endpoint management, and reporting.

### *Jamboard*

Jamboard is a digital whiteboard device with a 55 inch 4k UHD touch display, intended for real-time team collaboration using tools to help create and share ideas. It offers drawing tools, handwriting and shape recognition, pre-made stickers, sticky notes, and easily integrates with other tools - clip content from the web using Google Search, insert a Google Doc, Sheet or Slide, or add images from Drive or a smartphone. A "jam" is accessible on smartphones and tablets, it can project into a Hangouts video meeting, and all work is saved directly in Google Drive.





### *Gmail Delivery*

Gmail Delivery is the supporting service responsible for routing and delivery of mail messages for Gmail and other Google services.

### *Gmail Frontend / Middleware*

Gmail Frontend / Middleware is the stack of supporting services and devices responsible for serving up the user interfaces and web services for Gmail and its clients.

### *Gmail Medley*

Gmail Medley is the backend server supporting Gmail that interfaces with the frontend to serve up messages through a “medley” of functions: encoding and detection of language, message parsing, spell checking, document conversion, etc.

### *Gmail Spam*

Gmail Spam is the supporting service performing anti-spam work to keep unwanted or malicious email messages from reaching Gmail users, by using various filtering and detection methods.

## **Infrastructure**

G Suite, Other Google Services and Supporting Services runs in a multi-tenant, distributed environment. Rather than segregating user entity data to one machine or set of machines, data from all user entities is distributed amongst a shared infrastructure. For G Suite, Other Google Services and Supporting Services System, this is achieved through a Google distributed file system designed to store extremely large amounts of data across many servers. Customer data is then stored in large distributed databases, built on top of this file system. Where applicable, alternate storage procedures are documented and in place for backing up and recovering customer data.

### *Data Centers and redundancy*

Google maintains consistent policies and standards across all data centers for physical security to help protect production and corporate servers, network devices and network connections within Google data centers.

Redundant architecture exists such that data is replicated in real-time to at least two (2) geographically dispersed data centers. The data centers are connected through multiple encrypted network links and interfaces. This provides high availability by dynamically load balancing across those sites. Google uses a dashboard that provides details such as resource footprint, central processing unit capacity, and random-access memory availability to monitor resource availability across their data centers and to validate that data has been replicated to more than one location.

### *Authentication and access*

Strong authentication and access controls are implemented to restrict administrative access to



G Suite, Other Google Services and Supporting Services System production systems, internal support tools, and customer data. Machine-level access restriction relies on a Google-developed distributed authentication service based on Transport Layer Security (“TLS”) certificates, which helps to positively identify the resource access requester. This service also offers transport encryption to enhance data confidentiality in transit. Data traffic is encrypted between Google production facilities.

Google follows a formal process to grant or revoke employee access to Google resources. Lightweight Directory Access Protocol (“LDAP”), Kerberos, and a Google proprietary system which utilizes Secure Shell (“SSH”) and TLS certificates help provide secure and flexible access mechanisms. These mechanisms are designed to grant access rights to systems and data only to authorized users.

Both user and internal access to customer data is restricted through the use of unique user IDs. Unique user IDs, strong passwords, One-Time-Passwords (“OTP”) and periodic reviews of access lists are implemented to help ensure access to customer data is appropriate and authorized. Access to production machines, network devices and support tools is managed via an access group management system. Membership in these groups must be approved by respective group administrators. User groups are annually reviewed.

#### *Change Management*

Change Management policies, including security code reviews and emergency fixes, are in place, and procedures for tracking, testing approving, and validating changes are documented. Changes are developed utilizing the code versioning tool to manage source code, documentation, release labeling and other functions. Google requires all code changes to be reviewed and approved by a separate technical resource, other than the developer, to evaluate quality and accuracy of changes. Further, all application and configuration changes are tested prior to migration to production environment.

#### **Data**

Google provides controls at each level of data storage, access, and transfer. Google has established training programs for privacy and information security to support data confidentiality. All employees are required to complete these training programs annually. All product feature launches that include new collection, processing, or sharing of user data are required to go through an internal design review process. Google has also established incident response processes to report and handle events related to confidentiality. Google establishes agreements, including non-disclosure agreements, for preserving confidentiality of information and software exchange with external parties.

#### **Network Architecture and Management**

The G Suite, Other Google Services and Supporting Services System architecture utilizes a fully redundant network infrastructure. Google has implemented perimeter devices to protect the Google network from external attacks. Network monitoring mechanisms are in place to prevent and disconnect unauthorized access to the Google network from unauthorized devices.



## People

Google has implemented a process-based service quality environment designed to deliver the G Suite, Other Google Services and Supporting Services System products to customers. The fundamentals underlying the services provided are the adoption of standardized, repeatable processes; the hiring and development of highly skilled resources; and leading industry practices. Google's repeatable process model includes key infrastructure and product related processes and controls over security, availability, process integrity, and confidentiality.

Formal organizational structures exist and are available to Google employees on the Company's intranet. The intranet provides drill-down functionality for identifying employees in the functional operations team. Google has developed and documented formal policies, procedures, and job descriptions for operational areas including data center operations, security administration, system and hardware change management, hiring, training, performance appraisals, terminations, and incident escalation. These policies and procedures have been designed to segregate duties and enforce responsibilities based on job functionality. Policies and procedures are reviewed and updated as necessary.