Google Clouds for Public Administration: An Innovation in the Cyber World

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Abstract
This paper analyzes how to use a newly launched ‘Google Sites for suitability as a knowledge management and training tool in Public Administration. The cost of software purchase and its maintenance is a big issue for government and public sectors. The emergence of high speed internet has given rise to new concepts like software as a service. SaaS (Software as a Service) has a new way out, the software is made and maintained by the software firm and used by the organizations. If the software is provided by Google then it has double benefit for any organization. Paper discusses different factors like privacy, scalability, support, Technology, ease of use, provision of essential services, Internal communication facilities, searching capabilities, accessibility control and administration, licensing location, management and Cost of 'Google Sites' for implementing it as a KM and training tool in Public Administration environment.

Keywords: SaaS; Cloud Computing; Google Apps; Innovative Cyberworld; Knowledge Management.

Introduction
Software as a service (SaaS) is an application delivery model where a software vendor develops a web-native software application. It hosts and operates the application for the use by its customers over the Internet[1]. One of the biggest distinctions about this business model is that customers do not pay for owning the software itself but rather for using it. It helps the organization to get advantage of Information Technologies without concerning the technical and implementation issues.
Developing software or purchasing a readymade one is costly affair for any organization. Total implementation cost of software including the hardware, networking and human efforts goes much beyond the expectations of CIO (Chief Information Officers) of any organization. The cycle of need, purchase, development, implementation and maintenance is long one in which most of the public administration sector either fails or they succeed partially. Being in the remote place, not accessible by the big giants like Microsoft, Oracle, Sun Microsystems or IBM, they go to some small and medium software companies having less expertise in implementation and development of such type of latest concepts like Knowledge Management. Results are partial success or total failures. If the knowledge is organized, managed and used properly with the minimal cost, it can give you better results in terms of more and more innovations and intellectual property.

SaaS technology reduces total cost of software development by eliminating the initial capital expenditure to buy and develop software in-house. It also reduces operational cost by reducing software maintenance.

Google Sites
'Google Sites' was launched by Google on February 2008. The new service is a part of Google Apps and allows us to create web sites collaboratively. We can work together on a Site to add file attachments, information from other Google applications (like Google Docs, Google Calendar, YouTube and Picasa) and new free-form content. Creating a site together is as easy as editing a document, and we always control who has access, whether it's just ourself, our team, or our whole organization.

Google offers templates, a rich-text editor, 10GB of storage for each Google Apps account and integration with other Google services so we can embed gadgets, calendars, spreadsheets, presentations, photo slideshows and videos for training program in Public Administration environment. We can invite people to collaborate or just view a site and we can also publish the site so that anyone can view it”.

What is SaaS?
Simply SaaS can be defined as “Software deployed as a hosted service and accessed over the internet[2]”.

Software are generally sold on one time licensing model, but SaaS applications are sold frequently using subscription model. The customers pay an ongoing fee for using the applications. Fee structure may vary depending on the number of users of the number of geographical sites that organization has.

Many vendors provide application programming interfaces (API) that expose the applications data and functionality to developers for use in creating composite applications. A variety of security mechanisms can be used to keep sensitive data safe in transmission and storage. Applications providers might provide tools that allow customers to modify the data schema, workflow and other aspects of the application's operation for their use.

Deploying Application in SaaS
With SaaS, the job of deploying an application and keeping it running from day to day
(testing and installation patches, managing upgrades, monitoring performance, ensuring high availability, and so forth) is handled by the provider. By transferring the responsibility for these "overhead" activities to a third party, the IT department can focus more on high-value activities that align with and support the business goals of the enterprise. Instead of being primarily reactive and operations-focused, the chief information officer (CIO) and IT staff can more effectively function as technology strategists to the rest of the company, working with business units to understand their business needs and advise them on how best to use technology to accomplish their objectives? Far from being made obsolete by SaaS, the IT department has an opportunity to contribute to the success of the enterprise more directly than ever before.

**SaaS Application License**
SaaS applications are distinguished by three factors Licensing, Location and Management. Mostly this type of software follows per user license Deployment of the solution is another issue. For example, they may have a black box kind of thing placed in your IT environment, which will catch the queries and send it across the network to company’s server.

The management of application, provided by the IT firm, is mostly done by that firm only. The customer will only use it through browser or API supplied by the vendor. The SLA (Service Level Agreement) governs the quality, availability and support commitments. SaaS has become mainstream application after being a curious general concept[3].

**Google Apps as Cloud Computing**
Google Apps is the best public cloud. As far the definition of cloud is concerned, Wikipedia defines it as "Cloud computing is Internet-based computing, whereby shared resources, software and information are provided to computers and other devices on-demand, like a public utility". As far the cloud computing is concerned, it has many applications in the government and public computing. Cloud computing suites to e-government due to some strong reasons. Constant development of computer infrastructure and constant increase of user's skills and knowledge of operating computers and the Internet are the main reasons[4]. Even though cloud computing is in its early stages, industry analyst believe that it will become a mainstream technology tomorrow[5]. One of the major challenge that cloud computing or the SOA (Service Oriented Architecture) faces is the adaptability of heterogeneous interfaces (required in public sector) to the large application design[6].

**Motivation**
Public Administration promotes a culture of excellence in performance and to improve the quality and delivery of services in government and private sectors.

We were attracted by the functions of the Knowledge Management in Public Administration. The similarities between Google site’s facilities and the work done in Knowledge Management motivated us to write this paper.
Different kinds of technologies coming from different parts of the world are right. Difficult part is whether we can get benefit from them or not. Implementation and use of the technology is difficult compared to invention of the new technology. Particularly in software and computer fields there are hundreds of products, innovations and techniques. Only part of concern is that technology should be implemented, benefited and used by the common man.

‘Google sites’ is the solution which is free of cost and a hosted solution. This can be used as knowledge management and training tool in Public Administration environment.

**Background**

This paper is for the live application. Anyone can start implementing the 'Google Sites' for knowledge management or training process. Following are some strong reasons given to support my argument.

- Easy accessibility to the Internet (or Broadband) in most of the countries.
- High cost of implementation of software and hardware systems for these works across the world.
- Members of non-IT organization are not aware of the technical issues and related difficulties / availability.
- Upgradation of Hardware and software are major issue for having an updated and live application in the organization. Like providing latest features of spam filters, antivirus software is difficult task at organizational levels. For this an organization has to maintain different account with antivirus company then a separate accounts with email software company for updating of their email software against latest threats or spam filter technology.
- If an organization wants to get best of everything, best among Scheduler, email software, Chat software, getting accessibility through different means like mobile Phone & Internet desktops, then 'Google Sites' is the answer.

**Knowledge management in public administration**

Knowledge Management ('KM') comprises a range of practices used by organizations to identify, create, represent, and distribute knowledge. It has been an established discipline since 1995 [7] with a body of training institute’s courses and both professional and academic journals dedicated to it. Effectively managing information is very important in business. Knowledge Management is a multi-billion dollar worldwide market. Knowledge Management programs are typically tied to organizational objectives and are intended to achieve specific outcomes; These can include improved performance, competitive advantage innovation, lessons learnt transfer and the general development of collaborative practices.

Since the mid-nineties the label knowledge management has attracted much attention while information management has been used less. With information
management, there is no agreement on what constitutes knowledge management [8]. According to Wilson, knowledge management is either used as a synonym for information management or for the 'management of work practices' which are to improve the sharing of knowledge in an organization [9].

**Training Process in Public Administration**
One of the main objectives of Public Administration is to enhance the ability of public and private sector employees and prepare them academically and empirically to be more responsible. The training required modern technical aids such as training films, advanced electronic programs, and other training aids which facilitate the information transmission process to trainees. Public Administration is juxtaposed with main features of KMS[10].

**The 'google sites'**
The ‘Google sites’ is the part of Google Apps. The service uses public products of the Google like Gmail, Google calendar, Google docs etc. The ‘Google sites’ combines the features of all these products under a single umbrella and gives best among all. There may be Videos, Audio files, Photo Gallery of trainers and trainees, text files, spreadsheets, photos identity cards etc. The components of Google are available on different handheld devices, which ensure easy accessibility. For example it is accessible on simple phones, blackberry etc. Availability of the space is another issue as Google is providing enough space with every account that you open with ‘Google sites’. Shared address book and the availability of internal chat are other main features of ‘Google sites’. Many products in the Google family have features like addition of country specific / religion specific holidays in the calendar. We can view the slideshow of the PowerPoint within the browser only, if we receive them by email.

**Components of google sites**
The Google Apps has the following applications which are supported by ‘Google Sites’. [11]

- Gmail
- Google Talk
- Google Calendar
- Google Docs.

**Gmail**
Gmail currently provides 25 GB of storage space per account. It has an award winning Spam filtering technique. It also supports customized domain name systems like Farooquink.com. Powerful-searching facility inside the Gmail interface makes it easy for the user to search inside the huge email that everyone receives. Gmail being a Google product also provides the effective protection from the virus and spam.
Support on the mobile handsets makes it very attractive. In a globalized world, support to various languages is an issue. Gmail supports almost all the major languages.

Gmail can be used as the email system for the 'Google Sites'. All these features make it very much suitable for the Public Administration training environment to have the 'Google Sites' as their KM tool for accumulating, storing, manipulating and generating new information.

Email is the fundamental need of any organization. Furthermore, Email has become the compulsory medium for official and unofficial communication in all organizations.

The Gmail is the best email, which is compatible with the ‘Google Sites’, and ensure good quality intra-communication.

Effective filters, labels, and Web clips are some of the features of Gmail[12].

**Figure 1:** Gmail Inbox and Chat Screen.

**Google Calendar**
Any organization and training institution will have events, schedules, programs, gatherings, conferences, meetings, guest speeches, lectures, seminars, and symposiums. This information must be shared among all the concerned people like administrative staff, higher authorities, trainees, and trainers. Google Calendar supports such facilities. We can create a calendar and share it among a number of people who have Gmail ID. They can see, edit, and delete schedules as per our permissions. You have authority to give respective permission for all the said things. The interface of the Google Calendar is of drag and drop, so it’s easy for non-IT people to manage, particularly the Administrative staff who usually deals with scheduling and rescheduling. Google Calendar supports amazing integrity as it can import data from any other calendar and scheduling applications like ‘MS Outlook’, so if you have some schedules already in the outlook, you can transfer it to share among your peers or students.
You can automatically add holiday calendar of several countries to your Calendar. Even religious days of every religion are also available for the addition to your calendar. The addition of your events is an easy task, as shown in the “Fig. 3”, you just have to click and add the event details[13].

Calendar also supports mobile reach. Calendar automatically sends you an SMS having daily agenda for the next day. The SMS arrives at 5 PM the previous day. These incoming SMS are free as Google has a tie-up with different mobile providers. You also have the option of making your calendar public.
In training environment, we always need to have interactive communication. Mostly, the official communication is in the written format for which we can use Gmail, but peers, trainees and trainers always require communication. If all are on the Gmail, they can Chat online, send the files online to each and leave a voice mail message when the receiver is not logged into the systems. This feature is also supported on the Mobile handset resulting in far off reach when employees, trainees and trainers are traveling.

**Google Docs**

It’s an amazing product from Google, as it provides editing by multiple people for your documents, spreadsheets and presentations. You remain the best controller, as you can publish it for your team, your department or the whole organization. Mobile accessibility is provided, so your team can see changes made by other member on the move. Particularly this product suites to the team of faculties who organizes different
events in the university like conferences, events and seminars. All the people must be in the loop when anyone makes any modifications.

![Image](image1.png)

**Figure 6:** File Management Screen of the Google Docs.

![Image](image2.png)

**Figure 7:** Google docs upload Screen with Upload restriction details.

Now Google Gears allow you to edit the documents, spreadsheets and presentations offline and update when you get connected to Internet. It is a great feature for the head of the organization that mostly travels on long trips. It tracks the individual changes. So it is easy to find who has done what and when. With the Google’s searching ability you can search well inside the documents, spreadsheets and presentations. A well interface Google Documents file management system is available for use. In this file management utility, you can hide, show, share and upload the files.

Support to different languages makes Google docs a great product and increases its reach among different type of Public administration environment and their respective regional languages. Even in some European and Asian countries, administration prefer their own regional languages compared to English. It makes them more effective. Also they may reach the masses in their respective area with their mother tongue. It is always useful to give education in mother tongue.
The availability of presentation files on various training aspects and different files of assignment will be of great benefit. Particularly this mobile generation can access it from their laptop or from the mobile handsets. The case study files submitted by different trainees and trainers can also be shared and edited by others, this is ensuring the work done even if trainer is traveling somewhere.

You can upload presentations up to 10 MB and spreadsheets up to 1 MB[14].

**Integrating them all**

The systems administrator sitting in the admin room can maintain the whole web contents of Google sites. The system administrator can customize and built the front page as it is totally customized. The 'Google Sites' is the central place where an employee, trainee or trainer can view any type of media available for them in the organization. Any Google Gadgets that administrator wants can be placed on the first page, which gives a 100 percent customized and new look to the front page of the organization.

Furthermore the 'Google Sites' supports almost all the major browsers & languages, so global access is guaranteed. The 'Google Sites' supports migration from any other email management tool like Microsoft Exchange or outlook. You can transfer your calendars, email and other appointment details from those tools to the Google applications. Even old email can be migrated to Gmail. If you don’t want to lose your old email address and still want to use the Google applications in different areas, you can use the email routing applications. Here the email will be received on the old email ID and from there it is migrated internally to your email id. Policy management services include these services.

![Google Sites](image)

**Figure 8:** Parts of administrative screen for 'Google Sites'.

With the help of Google Application engine you can host any custom build application on Google infrastructure. This helps the organization in using customized application for some customized work.

You can make the starting page of your academic organizations which will have glimpse of almost all the Google products. Following is the page of an organization called organic city which combines many Google Products.
Google Clouds for Public Administration

Figure 9: Start page of the organic city web page, which has maps, news, and internal file management system

Google Application versus Others

Google application in comparison of other applications seems far more focused on what the customer needs. Google Application brings a new "web based" approach to enterprise collaboration software. Google Application is positioned as next generation enterprise software, specifically targeting on premise Microsoft messaging and collaboration products (Exchange and SharePoint). More and more companies are signing up, and seeing it as a viable alternative to Microsoft and others. It has generated massive media interest with Microsoft versus Google Application comparisons rising to a fury.

For example, New York University announced recently that it’s moving to Google Apps for Education, providing cloud-based email and collaboration tools to the entire university community and administration. With students and faculty across New York now using Google Apps, it looks like the Empire State has fully embraced the cloud. Google privacy and security policy are also very transparent.

Table: google application versus microsoft bpos and hyper office.

<table>
<thead>
<tr>
<th>Features</th>
<th>Google Application</th>
<th>Microsoft BPOS</th>
<th>Hyper Office</th>
</tr>
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<tbody>
<tr>
<td>Document Sharing</td>
<td>Concurrent document editing, shows who made what edits and offline access</td>
<td>Offline access, integrated with online, Wordprocessing, RSS feeds, Templates</td>
<td>Drag and drop into web folders without having to upload or download, Interlink relevant files with emails, projects, and events</td>
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</table>
Applicability
The big question is why "Google Sites" is suitable as Knowledge management and Training tool for the Public administration environment. I think it is 100 percent suitable because of two strong reasons.

This works as a SaaS (Software as a Service)
Storage, maintenance and working of the software are the responsibility of the software service provider[15]. The Google will maintain all the things and they guarantee the ninety nine percent (99 %) uptime for all their services.

Google is an Innovation Company
Google has the product like Google talk, Google Docs, Google Spreadsheets, Gmail, Google Books, Google Maps and Google News etc. The pace with which Google is coming up with new products and services, everyone is looking at Google as the innovative Company.

In future also it is expected that Google will come up with a Phone and an operating system. Google already has a mobile software development platform called Android.

As far as privacy of data in Public Administration environment is concerned, Google has best security mechanism. The products like Gmail, Calendar etc. has their own protection, while the data that you will put in the 'Google Sites' will have access control mechanism which you can control through First Page, so that data will be accessible by those people only. Google has excellent privacy policy which protects the user’s information [18].

Scalability is another issue, as Google is providing 10 GB of space with each 'Google Sites' account. I think, this is a sufficient storage space. In the future also
Google will come up with more and more space for other products, it is expected that it will also grow.

Google provides help websites for all programs, and they have demos, videos and FAQs available on each of products which are the part of 'Google Sites'. All the software, demos and other things are in the standard languages, protocols and compatible with each other. So in terms of support Google is excellent.

Google is a king as far as searching technology is concerned. Other technologies like availability on different mobile handsets, reach with leading telecom providers in the whole world, is with the Google. It is available in leading languages of the world, so quite reachable. The whole 'Google Sites' is of a new concept called SaaS.

Since 'Google Sites' is the browsers based software. All the components involved in this group of project are well known to the world, every next person is still using them even if they are not using 'Google Sites'. The kind of interface Docs, Books, Calendar and Gmail uses are very easy and understandable by any kind of person anywhere in the world. So in terms of ease of use 'Google Sites' is unbeatable [19].

The group of services that 'Google Sites' involve are Calendar, Documents (all types of documents and worksheet files), Gmail, Books, Maps, Videos and News. So everything that Knowledge Management requires all here in the 'Google Sites'. So it has all the essential services.

The products like Google Talk and Chat facility inside Gmail interface provides a great interaction and communication for training. Every product comes with the Google searching capability. So it’s easy for anyone to search inside their email, documents, chats or Books or news. So in terms of searching facility 'Google Sites' is number one in the world. The 'Google Sites' can be accessed on the desktop browser or on the mobile handset browser. This guarantees the long reach of this product and worldwide accessibility. With the 'Google Sites' you can control user accounts, customized your services, email routing, and can have your own policy in terms of regulatory issues. So in terms of access control 'Google Sites' provide better facilities.

**Conclusions**

With reference to above points VII (A, B, C, D), you can conclude that collecting, managing and sharing information is not an easy task. Due to big size of the organizations and habits of different kinds of peoples in the organization you cannot share the information in an efficient way.

Furthermore it is clear from point 1 (Introduction) that software making / purchasing from the vendor and implementation is economically not feasible for middle and large organizations.

The innovative way from the Google is service called as 'Google Sites' which is hosted service. It provides a collection of products (point VII -A, B, C, D) which can host the data of any Public Administration and Knowledge Management environment. The point IX (Applicability) discusses in detail how 'Google Sites' will be a suitable service for Knowledge management and Training Tool. It can provide best Services in current scenario.
References


