

Leveraging the Cloud for Startups

By:

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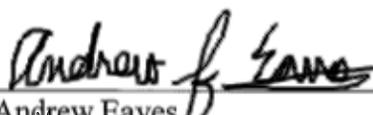
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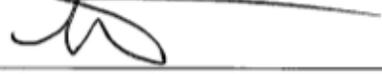
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Abstract

Startups have a need for agile and elastic infrastructure to show to the investors that they will be able to expand and meet desired growth. We have created a framework that startup companies can use to build their infrastructure in the cloud, which provides the agility and elasticity that investors are looking for. The model includes a use case with the company Innoviator LLC, who is looking for a way to meet compliance and looking for flexibility to expand operations. This model allowed us to create an infrastructure that meets their vision of expansion. We have used Box, Okta, Microsoft Office 365, and Grasshopper to provide a full suite of cloud solutions. These tools are integrated to provide a more seamless experience for the users of the tools.

Background

One of the biggest hurdles to overcome in growing a new startup is cost. The cost stems from a wide range of things that the startup needs to acquire in order to grow the business. Most expenses are usually justified because they have an immediate impact on the performance of the business. Cost is a hurdle that is not unique to only startups.

Information Technology (IT) systems and support is a cost center for companies that do not specialize in offering those systems and support. This means that most of the expenses invested in the IT department do not generate revenue. At some point, a startup decides that it would like to expand their operations or increase sales. There are many ways that the business can expand their operations and sales through the use of IT systems. Three examples of this would be; going from a PC in an employee's house to servers housed on site or in a datacenter, purchasing and installing a new phone/VoIP system, or hiring first/additional IT personnel. All of the traditional solutions to these problems are typically high cost activities that do not directly impact the revenue of a business. They do provide scalability and operational efficiency but the business is required to invest a sizable amount of money to fund these solutions.

It is common for entrepreneurs to seek venture capitalists for money to fund their company. Although venture capitalists are available, they do not invest their money without the correct business plan. A detailed business plan and accurate forecasts are typically required by these venture capitalists before any kind of contract is considered. These venture capitalists require agility, flexibility, and elasticity to increase performance of the small business and ultimately make money on their investment. A company that is built on the cloud can meet all these requirements.

Problem Description

As mentioned earlier, cost is the largest and most identifiable problem for any business. By nature, startups do not have a large amount of money to spend on capital expenditures. Startups must have the ability to purchase any amount of hardware which can reduce the remaining budget drastically. Software or the licenses for software that will be used for operational efficiency and scalability will also reduce the budget. Reducing the cost of the hardware and software is a solution to one of the problems.

An additional problem stems from the fact that not all businesses are IT savvy. The need for an easy way to move to the cloud and be confident in your decision is key. Data that supports a decision will make the entrepreneur confident and allows them to make an informed purchase or use this data to reach out to an investor.

Problem Solution

The main solution is to provide a framework that startups can use to structure their IT environment without requiring extensive technical knowledge. The previous discussion explained how the framework would work for startups and what it would accomplish. The framework contains four main software areas that provide a suite of solutions, increasing the scalability and performance of a startup. Using the template(s) allows the business to select the appropriate tools for their environment while avoiding overlap. Included with the solutions, we have given the company a multitude of information that the startup can use with the investors to show they are capable of rapid expansion, including numbers for cost. The framework contains cloud software suggestions for email, security, storage and collaboration based on a given industry.

Innoviator is a local flight engineering company from Ohio that was founded in 2007. Innoviator is a small business. Their employees are not IT professionals, but understand the potential of information technology. Innoviator allowed us to work with them to develop our framework. The recommendation for Innoviator, while applying the framework, is similar to what would be seen with many starts up of that size that are looking to rapidly expand.

Research Analysis

Solutions

The suggested email solution for a startup is Office 365 Small Business which is offered by Microsoft. Office 365 offers the customer email at a very low cost per user price with the benefit of being a Microsoft product. Office 365 offers a range of features at a lower price point making it a lost cost competitive product. Another important feature to note is that the Small Business edition provides license for each user to have the office suite. Microsoft is a prominent name in the business world and their products are the default choice for many companies.

When looking for a storage solution, there are a number of requirements that need to be met. Among those requirements are capacity, security, and accessibility of storage. After looking at a wide variety of solutions, Box was the top choice. Box delivers collaborative file sharing and files syncing. Box also offers many other features with their product at a competitive price point.

In order to solidify the security of Innoviator, Okta was selected as the application to provide another layer of security. It is in the best interest of a small business or startup to utilize single sign-on. This allows for more control over who has access to different applications. Single sign on is also a solution for the issue of password management. Those are a few of the many

benefits to single sign on.

Below is a diagram (see Figure 1) of the infrastructure at Innoviator and the current solutions that have been implemented by it. Underneath this current state diagram (see Figure 2) will be the suggested infrastructure for leveraging the cloud.

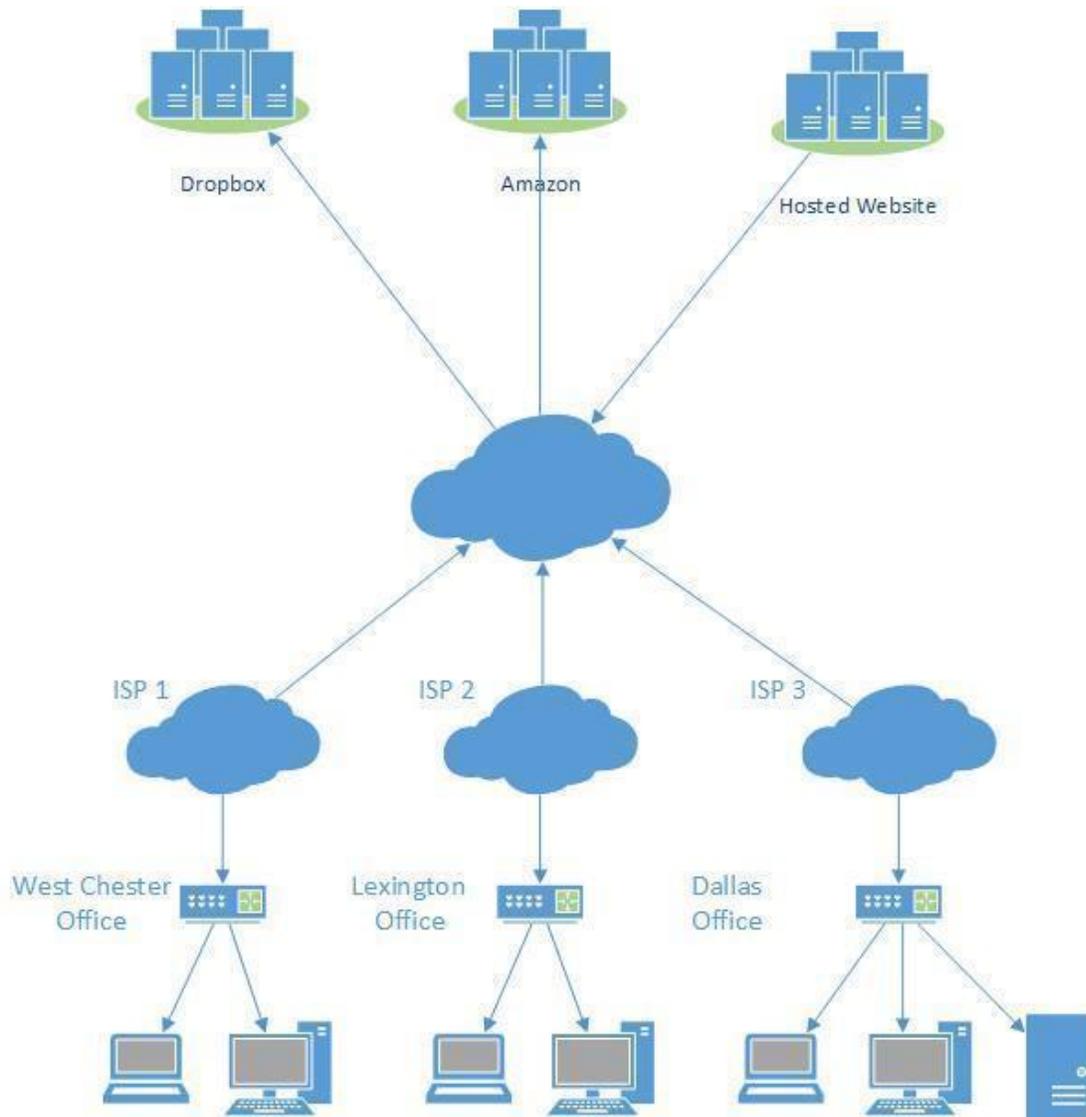


Fig. 1 Current Infrastructure

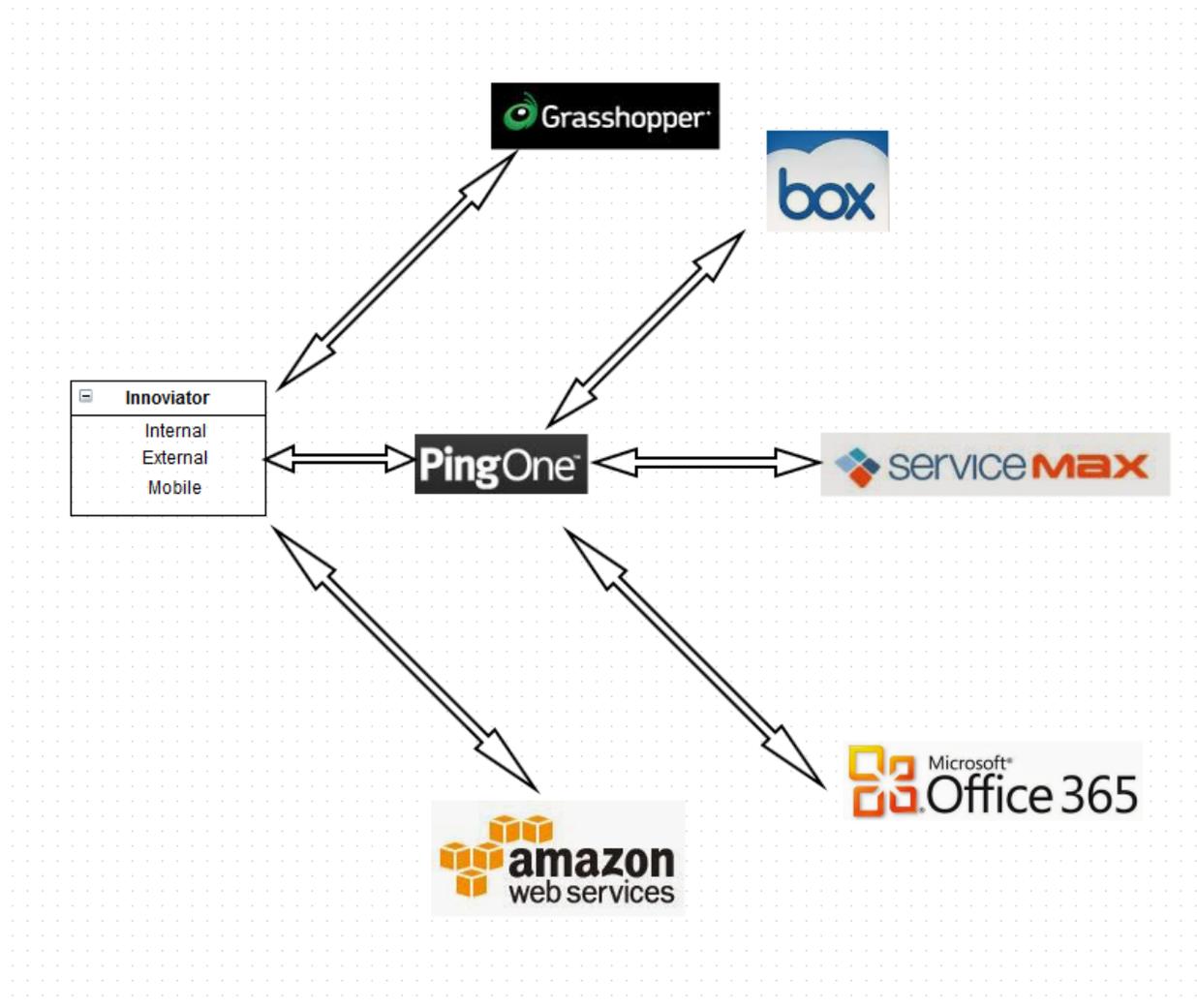


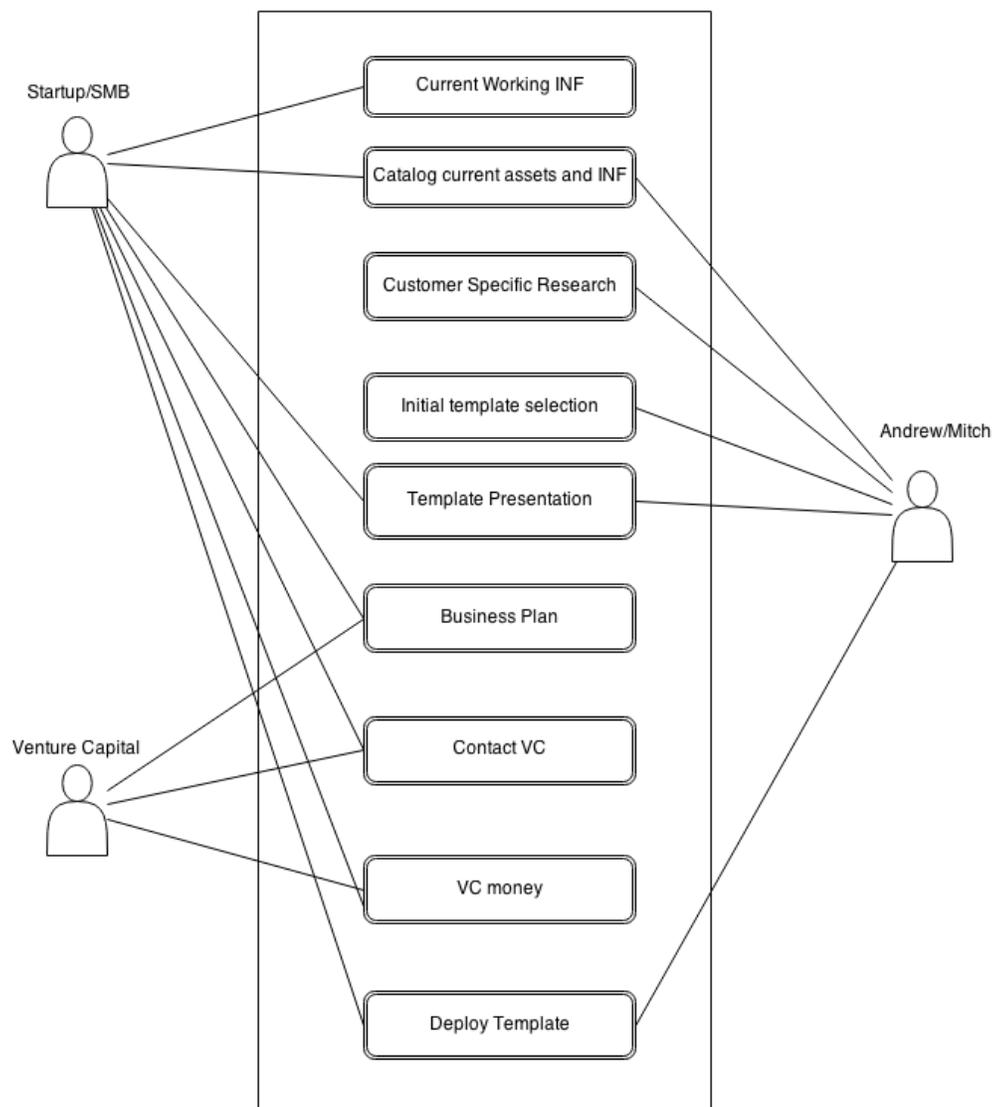
Fig. 2 Future Infrastructure

On the cloud, Innoviator's benefits are ease of access, collaboration, and scalability. Innoviator has intentions to become compliant in a couple of key areas which allows them to seek more prosperous customers for a new revenue stream. The goal is to enable compliance and present the resulting revenue increase as a powerful indication of what the cloud can do for a small business. The data from integrating the primary objectives benefits Innoviator as well as provide data to startups to entice venture capitalists.

User Diagram

Innoviator is a small company with around 15 employees that need to interact with the cloud solutions that are chosen. Looking at Figure 3, we see that there are three major users for this proposal. The first user is the startup/SMB role, which work with the authors Eaves and Gonthier to diagram the current infrastructure, work through the template suggestions, and to deploy the template. The venture capitalist will be contacted by the startup/SMB to review the business plan and potentially make a contract.

Figure 3 User Diagram



Potential Problems

The number one concern for this project is agreeing on a final solution that works best for our use case. In order for the company to begin using any of the tools that have been selected, the data will need to have been migrated from all of the different sources into the cloud. Each application will have to be populated and organizational structures will have to be recreated to minimize the impact of the transition. The goal is to make this process quick and low impact. As most businesses do, Innoviator operates under the principal that time is money. The less time that it takes to get Innoviator operational, the less money spent on the transition.

An additional concern for this project relates to Innoviator's compliance requirements. While working with Innoviator, it was stressed that it would like to be compliant in certain areas in order to take on new projects. In order to have compliance, there are very specific requirements that our IT infrastructure needs to have. These requirements usually demand a company to have on premise infrastructure and many security measures to ensure data is kept safe. On-premise hardware typically requires an IT professional to setup, install, and maintain the infrastructure.

Comparative Analysis

Selecting the right cloud solution for your specific industry and environment can be a very difficult and confusing process. There are four areas that software should be selected for a company to have a completely cloud based environment. There are many factors that go into deciding which software to select for each of these areas. One of the most important factors is ensuring that there is minimal overlap between the software. Another factor is making sure that

the startup owns the data that is being created, accessed, and modified.

Communication

The first cloud software to investigate is email, as it is a critical line of communication both in the business sector and personal. There are a few options for a cloud email provider but the first and foremost is Office 365 from Microsoft. A key factor to switch from a cloud email provider like Gmail, to Office 365 is that the startup company owns the data that is on the Microsoft servers. ("Office 365 Top Ten Lists") This plays a major role in the decision to use Microsoft. Also, Microsoft is a large vendor that provides stability to the startup. Microsoft offers their basic solution at \$5 per month per user, which is very competitive. ("Compare Office 365 Plans for Business") It uses a Class 3 extended SSL cert with 128 bit encryption. For a startup looking to create all new infrastructures, Microsoft's Small Business Premium includes licenses for Microsoft Office as well as the email service.

There are a few other options for cloud email. Other options for email service in the cloud are Atmail and Rackspace email. The major difference between Atmail and Office 365 is the new Web interface. The startup must learn to use a different interface than the Microsoft interface. Outlook and Office 365 have a more consistent feel and user experience requiring less training. Atmail offers a similar product to Microsoft's cloud email service. The other option is to use Rackspace Webmail, which offers email service for \$2 per user per month. ("Rackspace Email") This is cheaper, at \$50 less a year, than the comparable Office 365 offering for \$5 a month.

In this day and age, the Internet is where business is conducted. Nothing says good customer service like being able to pick up the phone and easily contact someone who can

answer questions. A voice over IP (VoIP) solution allows customers to easily communicate with the business. When researching a cloud VoIP solution, there were three very simple requirements that needed to be met. Innoviator wanted an answering service, a directory with custom extensions for desk, and the ability to forward to mobile phones. Grasshopper is the solution that has been selected because of their simple setup and pay-as-you-go subscription. Innoviator can be outfitted with a professional answering service without extensive contracts or large capital expense with the use of Grasshopper.

Storage

The second cloud software to investigate is a cloud storage provider because there may not be any existing hardware for file storage. Data is a critical aspect of businesses today which includes storage of files like contracts, work orders, and Intellectual Property. Box is a fitting candidate for a cloud storage provider because it has many enterprise features but not at the cost of an enterprise solution.

Box offers a vast array of apps, called Box Apps, within their storage application that allows for additional features. One of these additional features is the ability to use FTP for file migration from old storage or legacy system. Box has worked with Salesforce, a cloud customer relationship management tool, to integrate their services so that Box files are available in Salesforce. There are apps like Box for Office and Box Edit that improve the productivity of using box with the Microsoft Office suite. Specific integration with Microsoft Office minimizes the changes to a user's workflow by allowing them to keep using the Office suite but allowing them to save in the cloud. Box offers a solution at \$15 per month per user with all of these features and one terabyte of storage. ("Plans and Pricing")

Another important aspect of Box's service is the security that it offers which is applied to data at rest and on the wire. It uses 128 bit SSL encryption for data on the wire and, with an Enterprise license, uses 256 bit SSL encryption for data at rest. This is similar to Dropbox which offers 256 bit encryption for data on the wire and at rest. The key differentiator between Box and Dropbox are the access controls which allow a deeper level of control for the administrator. The competing cloud storage softwares do not offer access controls at a granular level.

Box is a feature rich tool that provides anytime access to cloud storage from any device however; there is a cost for those features, access, and mobility. The cost of Box's service for 15 users is roughly \$500 more expensive than a Dropbox for Business service. Box.com cost \$2700 for 15 users at \$15 per user per month. Even though Dropbox offers unlimited storage for a lower cost, it practical to go with Box because of the Box Apps and the access control features.

Industry Specific

The final selection of cloud solutions for Innoviator is an industry specific tool. Specifically for Innoviator, software that increases the productivity through easy management of their current work orders is desired. Solutions that require on premise hardware or substantial training to get current employees operational will be not be used. Currently there are a few solutions that meet some of their needs but there is not yet a perfect fit for Innoviator. The reason is the software usually requires a large investment of money and time. Additional training is required for the transition to this work order tool to be successful. Their current process for completing work orders is a hands- on, manual approach that works for their small number of employees.

Regardless of the company's hesitation in adopting new software, ServiceMax offers an

Express package that delivers on many of the pain points that Innoviator expressed when discussing their daily work processes. Our goal is not to find a large robust solution that has too many features. Innoviator operates on a lean and fast approach. Many of the other researched solutions have features that are unnecessary which is why ServiceMax Express was chosen.

Security

Security has become essential to businesses, especially if a business is using technology that is in the cloud. In addition to the solutions that have been suggested for Innoviator, a single sign on (SSO) solution is also being suggested. Two solutions stood out in the research, PingOne and Okta. For Innoviator, Okta fits their business model best. Okta comes with all the functionality that is desired from a single sign on provider but not at a tremendous cost.

Okta is a very straight forward service. There are four sign up categories; Single Sign On, Single Sign On Plus, Enterprise, and Enterprise Plus. The Enterprise Edition is a simple plan that a startup or small business that is lacking any identity management can really benefit.

The suggestion for Innoviator is to use Okta's Enterprise plan for single sign on. This package offers SSO from anywhere and importantly AD Password Mgmt., Reporting, Policy Engine, and directory integration. This package prices out at \$8 per user per month and includes a 30-day free trial. ("Editions") One of the large benefits over PingOne is that the business plan from Okta offers AD integration. This allows for the company to easily scale out into a full-fledged on-premise infrastructure while still maintaining their SSO security solution.

Budget

The budget of this project consists of pricing for the four areas of software that a startup will need, according to our proposed template, to move to the cloud. Innoviator is suggested to

use Office 365, Box, Okta, Grasshopper, and ServiceMax Express. The cost of moving to the cloud with these five software totals is close to \$8,000 with a pending quote from ServiceMax. The cloud is a more feasible solution than investing in hardware which requires a much higher cost of entry. The Harvard Business Review stated, in May 2013, that “75% of all startups fail.” (Blank 63-72) One contributing factor is spending a large portion of a budget on assets like network hardware. The budget of hardware to replicate the cloud services that have been suggested is near \$10,000. This does not include the cost of the System Administrator that would be necessary to maintain the IT environment. The cost of a Systems Administrator with experience is around \$70,000 per year. (“2009 Computing Salary Ups And Downs.” 6)

The benefits of the cloud are quickly realized when comparing the two budgets. A difference of \$2,000 utilized elsewhere by the company. Figure 4 shows a rough budget of the bare minimum specifications to contain an infrastructure that would run the majority of the services listed in Figure 4. Email pricing for on premise email is complex and becomes expensive quickly. According to Forrester Research, there are nine areas to account for when pricing on premise email alone. (Schadler, Ted, Brown, Voce, and Burns 26) The areas of cost are hardware, server software, client software, storage, message filtering, message archiving, mobile messaging, staffing, and financing. Looking at hardware cost alone, the bare minimum for an exchange server without any other costs added on is roughly \$1,400 (see Figure 5). Dell’s PowerEdge R320, a rack server, would be used for the exchange server. Looking at Figure 4, Office 365 will cost Innoviator \$225 a month coming to \$2,700 yearly. At a fifth of the cost of the hardware, Innoviator can benefit from enterprise quality email hosted on the cloud.

Green Acres Budget

Service	Number of Licenses	Price per Month	Price per Year
Office 365	15 Users	\$225	\$2,700
Box	15 Users	225	2,700
Okta	15 Users	120	1,440
Grasshopper	Unlimited Extensions	49	588
ServiceMax Express	Not calculated	Not calculated	Not calculated
Total		\$619	\$7,428

Fig. 4. Green Acres Budget

Hardware Budget

Service	Device	Upfront Cost
Active Directory	PowerEdge R210 II	\$1,200
Email	PowerEdge R320	1400
Security	Barracuda SSLVPN 380	3000
Storage	PowerEdge R210 II + QNAP NAS	4000
Switching	2x Cisco SG100	400
Total		\$10,000

Fig. 5 Hardware Budget

Timeline

The timeline of this project is broken down into two main halves. The first half of the project time line consisted of large allotment of time dedicated to research. In order to highlight all aspects of the project, (figure 6) the timeline shows major work objectives in the first half and shows a high level breakdown of the second half.

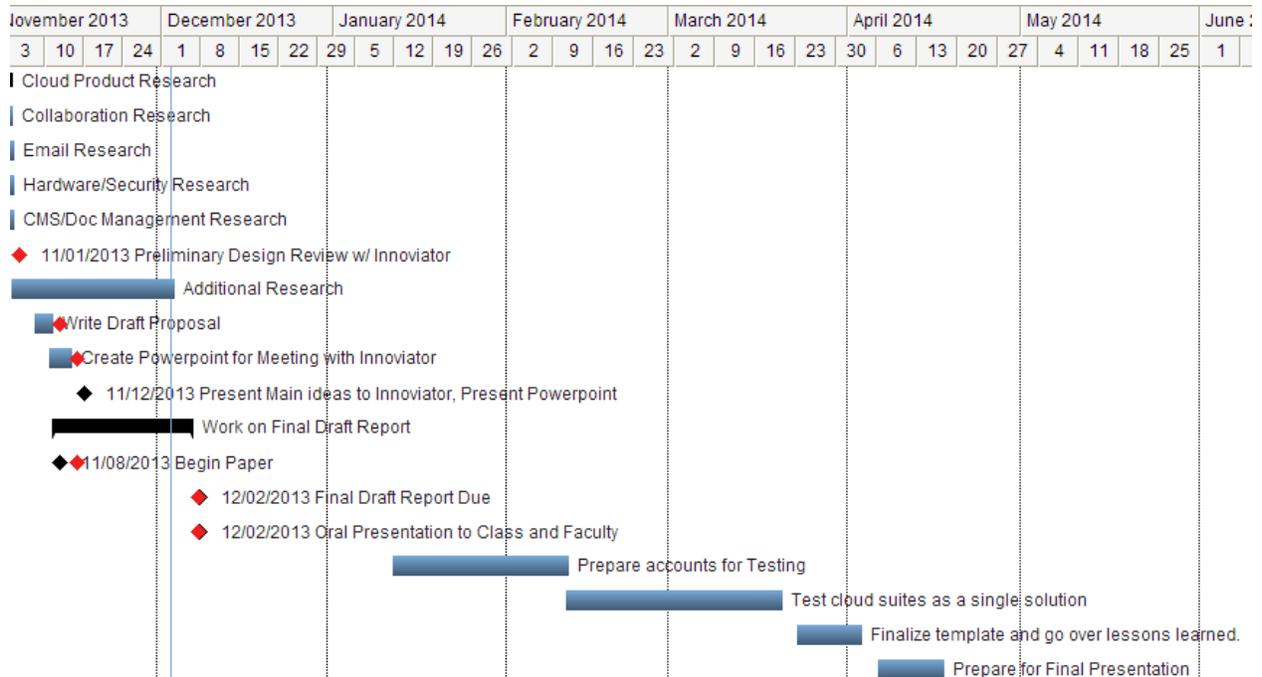


Fig. 6. Timeline.

Conclusion

In the battle to keep the cost down, leveraging the cloud is the best solution for startups and small businesses alike. Utilizing software as a service solution like Box’s storage service or Microsoft’s Office 365, businesses like Innoviator can achieve the same level of competitiveness as Fortune 500 companies. Research conducted throughout the project has been continuously digested and used to create buckets of cloud services that a small business can apply, like a template to achieve the benefits of an enterprise level IT infrastructure. Each solution provided by the template allows the small business easy access to scalability, manageability and a lower cost of entrance.

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