Information Systems
Infrastructure Analysis

Northeastern University | Experiential Network

Integration Seminar - Summer 2017

Uttej Gourisety, Ravel Charles, Taylor Rebbe, Zachary Taylor

Version History

Version	Implementer	Revision	Authority	Approval Date	Reason
1.0	Taylor Rebbe	08/06/2017	Project Team	08/06/2017	Creation
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Revitalize CDC Information System Infrastructure Analysis

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1   Executive Summary

1.1   Purpose Statement

To provide Revitalize CDC with several Information System (IS) solutions, which have the capability to increase data availability, integrity and confidentiality, while maintaining efficient systems integration.

1.2   Project Team

1.2.1   Individuals and Contribution

- Taylor Rebbe – Northeastern CPS, M.P.S. Informatics, Information Security Management. Contributions: *Network Infrastructure and System Security; analysis and recommendations.*
- Ravel Charles – Northeastern CPS, M.P.S. Informatics, Information Security Management. Contributions: *Security Policies, Salesforce, SugarCRM, Organizational Readiness*
- Zachary Taylor – Northeastern CPS, Northeastern CPS, M.P.S. Informatics, Information Security Management. Contributions: *Office Productivity Suite – Office 365*

- Uttej Gourisety – Northeastern – CPS, M.P.S. Informatics, Information Security Management. Contributions: *CRM option: Bloomerang, Office Productivity Suite: iDonate;* analysis and recommendations

1.2.2 Contact Information

- *Taylor Rebbe – Email: rebbe.t@husky.neu.edu, Mobile: (502)-345-8930.*
- *Ravel Charles – Email: charles.ra@husky.neu.edu, Mobile: (917)-558-6881*
- *Zachary Taylor – Email: taylor.za@husky.neu.edu, Mobile: (518)-817-3581*
- *Uttej Gourisety– Email: gourisetty.u@husky.neu.edu, Mobile: (660)-351-5136.*

1.3 Experiential Project

1.3.1 Company Description

Revitalize CDC performs critical repairs, modifications and rehabilitation on the homes of low-income families with children, the elderly, military veterans and people with disabilities. Through a short-term project, the student will conduct a needs assessment of IT infrastructure for our organization. We need to develop ways to track homeowner/recipient information such as gender, ethnicity, age, and tracking donor and sponsor information.

1.3.2 Organizational Challenges to be Addressed

How can we best track the necessary information? What type of program/database should we utilize? What are the costs associated with these IT programs?

1.3.3 Project Deliverables

A list of recommendations including pros and cons with features and benefits of various programs along with costs to track our data.

1.3.4 Project Goal

Our goal is to ensure you have options that will 1., ensure your critical data remains available and recoverable; 2., ensures ethical and moral obligations to the confidentiality of employee and constituent data are met; and 3., provide a

seamless, user friendly, and centralized solution that will have a positive impact on your productivity metrics.

1.4   Project Analysis and Solution

Through careful analysis the project team has identified that a software as a solution (SaaS) implementation would best meet the needs of Revitalize CDC. As a Non-for-profit, Revitalize CDC heavily relies on donor support to accomplish their mission. Those contacts represent the principle source of business capital and as such, the data therein requires a high degree of availability and protection. The Revitalize staff has begun to outpace the capabilities of their present solutions while experiencing organizational growth. Specifically, Revitalize CDC staff have conveyed dissatisfaction with application integration, availability and services which are no longer meeting business needs.

2   Network Infrastructure

2.1   System Overview

During the business needs interview, our project team learned that Revitalize CDC is presently using the standard wireless equipment and configuration supplied by their internet service provider. The details of that conversation revealed that the organization is currently satisfied with a service package which provides a bandwidth of 25 Mbps download and 10Mbps upload. Comcast Business provides a similar service level at a cost of 79.95 per month, contracted in a 2-year agreement. The next service level doubles the network bandwidth and is offered for an additional 10.00 per month. Both packages include the Comcast Business Wireless Gateway; this device will be regarded as the present baseline configuration in the current Revitalize network profile.

The Comcast wireless gateway, manufactured by Cisco, is fielded in 2 models; the DPC3939B and the DPC3941B. The wireless standards supported are IEEE 802.11 b/g/n and IEEE 802.11 ac/b/g/n, respectively. As a system, the gateway performs 3 primary functions. It provides a Data Over Cable Service Interface Specification (DOCSIS) modem, a firewall, and wireless network access. Security modes include

WPA-PSK (TKIP or AES) and a Comcast recommended WPAWPA2-PSK (TKIP/AES) to support legacy devices.

As the staff at Revitalize CDC feel the present network infrastructure is adequate, our wireless infrastructure review will focus on available technologies should their business needs or service quality change. Vulnerabilities in current configurations will also be addressed to promote informed decision making. We will identify best practice configurations, and discuss the benefits of a virtual private network (VPN) or remote access dial in user service (RADIUS) server.

2.2   Challenges Addressed

The challenges of a wireless infrastructure center around both network connectivity and security. For Revitalize, the ability to communicate and maintain relationships is the foundation of the organization. How they store, transfer and access information about those relationships comes with implicit, ethical and moral obligations. In this regard, our recommendations will address the challenges of network connectivity and security by identifying technologies and methodologies which represent a best-in-practice for organizations of this size.

2.3   Hardware, Software and Service Analysis

2.3.1 Wireless Network Analyzer

- Wi-Fi Analyzer.
    - Microsoft App Store; free.
    - Windows OS.
    - Detect network interference.
- Wi-Fi Commander.
    - Microsoft App Store; paid.
    - Windows OS.
    - 3D Network Display.
- Kismet.
    - 802.11a/b/g.
    - Mac OSX and Linux.
    - Passive scanning.

- https://www.kismetwireless.net.

2.3.2 Virtual Private Network Router

- Linksys LRT 214 Business Gigabit VPN router.
    - OpenVPN, PPTP, Client-to-Site IPsec.
    - Dynamic DNS.
    - Firewall – Stateful Packet Inspection, Web Filtering.
        - https://www.amazon.com

2.3.3 Wireless Access Point

- Edimax Pro WAP1750 Business Access Point.
    - 802.11AC Dual-Band High Speed up to 1750Mbps.
    - Built-In RADIUS Server.
    - Clustering for single point management; PoE.
    - https://www.amazon.com
- Linksys Business AC1200 Dual-Band Access Point
    - 802.11AC Dual-Band 80 MHZ Channel.
    - Captive Portal for Guest Access
    - Clustering for single point management; PoE.
    - https://www.amazon.com

2.3.4 Cloud Solutions

- No-IP, Dynamic Domain Name Service (DDNS) hosting.
    - Plus, Service Managed DNS - $34.95 per year.
    - Includes domain registration and phone support.
    - https://www.noip.com/remote-access.
- Jump Cloud, Directory as a Service (DaaS).
    - Cloud based RADIUS.
    - Salesforce and Office 365 Integration; Single Sign-On.
    - User and Device Management.
    - https://jumpcloud.com

2.4   System Utilization

A network analyzer is ideal for any wireless network administrator who seeks the capability to accurately and intentionally configure their systems. Wi-Fi analyzer for Windows by Matt Hafner, is an easily sourced solution, with a simple graphical user interface and straightforward menu options. Wi-Fi commander offers similar features, however offers a 3D network display and is only available for purchase. For advanced users, Kismet is an open source and freely available option for Mac OSX and Linux platforms.

Virtual Private network (VPN) technology has recently experienced increased recognition in the media; however, that recognition has largely centered on maintaining privacy through anonymity. In truth, the VPN does provide a reasonable expectation of anonymity but the advantage for Revitalize CDC will be in the security features it provides. Regarding usability, the specifications of the recommended Linksys LRT214 VPN router, exceeds the project use at Revitalize. Key features include an intuitive graphical user interface, advanced firewall features, IPSec and OpenVPN compatibility for easy IOS and Android device configuration, and logging capabilities.

Since Revitalize currently has a functioning access point, described as sufficient, implementation should only be considered if expenditure is decidedly worth the security or connectivity benefit. The routers presented, still require the gateway provided by Comcast, as would the VPN solution. If only trusted individuals are given a sufficient WPA2 key, then the present security configuration would be reasonably sufficient. Further considerations will be discussed in System Security.

Finally, the cloud solutions offered may or may not be required based on hardware and service selection. Should Revitalize decide to implement the VPN solution, they will either require a static IP address purchased through Comcast or employ a Dynamic DNS solution from a provider such as No-IP. If revitalize also decides to purchase the Linksys AC1200 Business Access Point with JumpCloud RADIUS, then only a static IP through Comcast would be sufficient negating the need for DDNS.

2.5 Network Security

The intention of systems security is to implement policy, procedure and technologies which enact controls exceeding either the ability or desire of the malicious attacker to engage the target. The tools presented would require a moderate initial investment in hardware and services; configuration could be sourced from a pool of volunteers or by a technically competent staff member. Each tool presented provides a unique set of features and the ability to add a layered security model to the Revitalize infrastructure.

Wireless network analyzers, which are freely available, will not only improve connection quality but may be employed to help identify rogue access points. Furthermore, an astute network administrator should pay close attention to owned wireless configurations for comparison, this effort will help to uncover evil twin attacks.

The Linksys VPN router will provide a secure tunnel through untrusted networks when employees are away from the office and forced to use either public or home networks. The router also provides the additional ability to maintain logs should a system compromise occur and filter by key words for website Uniform Resource Locator (URL).

The Edimax Pro wireless router with integrated RADIUS server, will effectively isolate individual connections within the network. The present system likely utilizes a relatively insecure WPA/WPA2 encryption protocol which is the standard configuration recommended by Comcast. In this setup, once a user is on the network through intentional or unintentional release of the key, any network user may compromise all network communications. The RADIUS implementation handles authentication and authorization per the individual device effectively providing a virtual private local area network (LAN) to each connected device. That is, users are no longer able to eavesdrop on network communications between access points and other systems. The Linksys Business AC120, will also incorporate RADIUS services when coupled with the Jump Cloud DaaS solution. The advantage being, system congruence if employed with the Linksys VPN router and the addition of a captive portal page for guest users.

2.6   Recommendation

Our network recommendations are based on network solutions that focus on high availability, ease of use and security. The recommended systems will be exceedingly superior to the presently adequate infrastructure in terms of connectivity and security. Our implementation will allow Revitalize staff to focus on their mission, not IT.

First and foremost, consideration should be given to increasing network speeds at the office to services which support 100 Mbps speeds, to accommodate present and future connectivity norms, i.e. teleconference, social media and the dynamic web. The monthly cost would be considerably more than current expenditures but worth the investment, given the heavy reliance on cloud based solutions.

A VPN should be implemented within the organization, along with a quality wireless access point supporting advanced security features. Our recommendation is to couple the Linksys VPN router alongside the Linksys business access points or similar. Revitalize will require a static IP from their service provider; the benefit is twofold. Revitalize will be able to employ Jump Cloud free RADIUS services and identity management as well as seamless VPN configuration.

Furthermore, a network analyzer and internet speed test should be implemented during setup and continually monitored to ensure the highest quality and most secure connections within their wireless environments. The initial configuration and documentation would be an excellent project for further collaboration with the Northeastern Experiential Network and students studying Information Security.

2.7   Implementation Cost

System	Type	Source	One Time Cost	Recurring Cost
100Mbps Internet + Phone	Service	Comcast Business	-	179.90* mo.
Dedicated IP	Service	Comcast Business	-	19.95 mo.
Network Analyzer	Software	Various	Free	-
Linksys VPN Router	Hardware	Amazon	136.37**	-
Linksys Wireless AP	Hardware	Amazon	147.94**	-

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Jump Cloud	Service	Jump Cloud	Free	Free < 10
-	-	-	-	-
Totals	-	-	**284.31**	**199.85 mo.**

* For the first 12 months with 2-yr agreement, new customers; less fees.

** Less tax and standard shipping.

3   Systems Security

3.1   End-Point Protection

Revitalized CDC is highly encouraged to implement end-point security solutions that will protect and ensure the availability and usability of their hardware and confidential data. To that end, the Northeastern Revitalize Project Team recommends several software and policy implementations to make their systems more secure, standardized and efficient. Rather than a survey of multiple systems, services or policies, we believe the following solutions will best suit the needs of the organization.

3.1.1   Antivirus

- Bitdefender, Gravity Zone Business Security.
    - Behavior-based, detected 99% of unknown threats; zero-day and new ransomware.
    - Security policy templates.
    - Centralized cloud based systems management.
    - Web filtering, rootkit, phishing, malware protection.
    - https://www.bitdefender.com/business/security.html

3.1.2   Password Management

- LastPass, Password Manager.
    - Increases password complexity, to comply with policy.
    - One complex password required to access password vault.
    - Supports numerous browsers and operating systems.
    - https://lastpass.com

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3.1.3 Encryption

- GPG/4WIN (WinOS), GPGtools (MacOSx) Encryption Suite.
  - Email encryption; OpenPGP and S/MIME.
  - File signing and encryption.
  - File checksum; SHA-256 and MD5.
  - GpgOL, plugin for Outlook.
  - Kleopatra, certificate management.
  - https://www.gpg4win.org
  - https://gpgtools.org/

3.2 Data Recovery

Backup and recovery will be addressed as part of the cloud based CRM solutions, however it is imperative that there not exist a single point of failure for recovery. This is especially true for cryptographic keys which are so secure that their loss or the loss of a password or phrase will render the data permanently inaccessible. Our recommendation is that a couple of external hard drives, with adequate storage space be purchased for offline storage and backup. Cryptographic keys should be independently backed up on a couple of thumb drives and kept in a secure location such as a fireproof safe.

3.3 Policy

3.3.1 Wireless

- Ensure the selected security mode on the wireless gateway is set to WPA2-PSK(TKIP/AES).
- Configure an inconspicuous SSID which doesn't identify the business.
- Utilize a wireless key of at least 21 characters.
- Create unique gateway / access point administrative credentials.
- Conduct periodic analysis of the wireless network environment with a wireless network analyzer.
- Keep cellular phone wireless settings disabled in public, only connect through a VPN when on untrusted networks.
- Configure VPNs to utilize IPsec or OpenVPN protocols.

3.3.2 End User

- Ensure employees are initially and periodically re-trained on the importance of information security.
- Ensure that employees connected to the network are aware they are being monitored.
- Ensure you have signed consent from your employees to monitor their network activity.

3.3.3 Password

- Utilize passwords of at least 21 characters in length.
- Utilize numbers, special characters, or random password generators.
- Ensure all employees are using a password manager such as LastPass.
- Do not store passwords on computers, online or in the office.

3.3.4 Backup and Recovery

- Complete a full data backup, weekly.
- Complete a system restore from backup, monthly.
- Maintain at least two backup hard drives, unmounted / mapped after data transfer.
- Maintain at least two backup thumb drives for cryptographic keys; store securely.

3.4 Implementation Costs

System	Type	Source	One Time Cost	Recurring Cost
Bitdefender Endpoint	Service	Bitdefender	-	221.99* yr.
GPG4/WIN	Software	Gpg4win.org	Free	-
Last Pass	Software	Lastpass.com	Free	-
-	-	-	-	-
Totals	-	-	**-**	**221.99 yr.**

* Yearly subscription for 6 systems.

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4 Customer Resource Management (CRM)

4.1 System Overview

4.1.1 Salesforce

First offered in 1999, Salesforce CRM is a cloud-based CRM that can run on any machine with a web browser and an Internet Connection. Salesforce is known to be one of the pricier options on the market but offers a bevy of solutions. Salesforce also boasts the largest app marketplace in the industry helping their clients integrate with many needed services. As well, their mobile apps are praised for usability and functionality as compared to others in the industry. Salesforce divides their platform by product for different operational teams in an organization.

4.1.2 SugarCRM

Founded in 2004, SugarCRM is a web application that runs on PHP-capable platforms and can utilize a locally hosted database management system and web server. Essentially, SugarCRM gives the organization the ability to choose where they want to host the product. They can host the product on a private cloud, on premise or on Sugar's cloud. SugarCRM is one of the most popular CRM products on the market that is available at a lower price point. Their product takes an all-in-one approach by offering different functionalities (ex. marketing, service tools) into a single package. Lastly, they are built on an open-source platform.

4.1.3 Bloomerang

Bloomerang, a cloud based donor management application is designed for the ease of use for nonprofit organizations in reaching, engaging, and retaining the advocates they depend on to achieve a better vision for a better world. Developed in 2012, this product's primary goal is to help achieve outstanding results through improvised experience of donor management and their loyalty. The idea of providing a platform to enhance the results, utilization of the application and flexibility of its usability at a reasonable cost helps build a

customer centric platform. Their concept of addressing the reason of how, when and why to improve the customer experience has helped them make remarkable progress. Finally, to note this application is completely cloud based and is independent of operating systems or any other system requirements, so any system with an internet can use this application.

4.2   Hardware and Software Recommendations

4.2.1 Salesforce

Web Browser	Notes & Recommendations
Google Chrome (*Most Recent Version*)	▪ Chrome applies updates automatically. ▪ Salesforce makes every effort to test and support the most recent version. ▪ There are no configuration recommendations for Chrome
Mozilla Firefox *(Most Recent Version)*	▪ Salesforce makes every effort to test and support the most recent version of Firefox.
Internet Explorer *(Versions 9, 10 & 11)*	▪ If you use Internet Explorer, it is recommended to use the latest version that Salesforce supports. ▪ Apply all Microsoft software updates.
Apple Safari *(Versions 5, 6 & 7 on Mac OS X)*	▪ There are no configuration recommendations for Safari.

Important Notes

1. Salesforce advises that cookies and JavaScript should be enabled when using Salesforce on all browsers
2. Salesforce also reports that some features, clients and toolkits have their own browser requirements.

Mobile Configurations

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- Salesforce can be used on any device that has browser capabilities and an Internet Connection.
- The actual app, named The Salesforce Mobile Classic app, can run on Android and iOS operating systems and can be found on your devices' corresponding app stores and/or marketplace.

4.2.2 SugarCRM

Server	Notes & Recommendations
Linux/Unix/Mac OS *(any version that supports PHP)*	- Sugar does not support any specific NAS or SAN devices. - Performance, throughput, and configuration issues should be addressed by your storage vendor. - Sugar performs testing with the NFS protocol and Linux-based clients and achieves acceptable levels of performance.
Windows *(Versions 2012 & 2012 R2)*	- There are no configuration recommendations for Windows.
PHP *(Versions 5.3 - 5.6)*	- For PHP 5.3, use PHP 5.3.25 or above

Database	Notes & Recommendations
MySQL *(Versions 5.5 - 5.6)*	- There are no configuration recommendations for MySQL.
DB2 *(Version LUW 10.5)*	- Supported for Sugar Ultimate and Enterprise editions only
Oracle *(Versions 11g R2, 12c)*	- Supported for Sugar Ultimate and Enterprise editions only
SQLServer *(Versions 2008 R2, 2012)*	- Requires using version 3.2 of the

	Microsoft SQL Server Driver for PHP which is only supported on Windows servers.

Web Browser	Notes & Recommendations
Google Chrome (*versions 49, 51, 52, 53, 55, 58*)	▪ There are no configuration recommendations for Google Chrome.
Mozilla Firefox *(Versions 44 - 53)*	▪ There are no configuration recommendations for Mozilla Firefox.
Internet Explorer *(Version 11)*	▪ Compatibility mode not supported
Apple Safari *(Versions 8, 9 & 10 on Mac OS X)*	▪ Private Browsing mode not supported

Important Notes

1. While the above components are necessary for running the Sugar application, it is outside the scope of their support to assist with the upgrading and maintenance of these components.
2. Sugar can run on Apache Web Servers and is recommended to use version 2.2.12 or above

Mobile Configurations

- The desktop version of Sugar is supported for Safari on iOS and Chrome on Android, but accessing Sugar via tablet browsers is not the optimal experience.
- SugarCRM Mobile can run on Android and iOS operating systems and can be found on your devices' corresponding app stores and/or marketplace.

4.2.3 Bloomerang

Web Browser	Notes & Recommendations
Google Chrome *(Most Recent Version)*	▪ Chrome applies updates automatically.

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	- Bloomerang makes every effort to test and support the most recent version. - There are no configuration recommendations for Chrome
Mozilla Firefox *(Most Recent Version)*	- Bloomerang makes every effort to test and support the most recent version of Firefox. - There are no configuration recommendations for Firefox
Opera *(Most Recent Version)*	- Bloomerang makes every effort to test and support the most recent version of Opera. - There are no configuration recommendations for Opera
Apple Safari *(Versions 6 and above)*	- There are no configuration recommendations for Safari.
Internet Explorer	- It is not available to use - All the support on IE has been set back, as advised by the Department of Homeland Security

Important Notes

1. Bloomerang advises that cookies should be enabled when using Bloomerang on all browsers
2. Bloomerang contains trusted third-party links redirecting to their customer, partners, and friends.

Mobile Configurations

- Bloomerang can be used on any device that has browser capabilities and an Internet Connection.
- No mobile application is developed or supported, but all support is present for mobile browser operability of the application.

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4.3   System Usability

4.3.1   Salesforce CRM

1. Reports & Dashboards
    a. An abundant number of tools to automate processes and reporting.
    b. Process Builder allows you to automate several basic organizational processes.
    c. Visual Workflow allows you to collect information from users and operate on it.
    d. Workflow features allow you to automate sets of delayed actions.
    e. Can customize how records get approved with their Approval Feature.
2. Validation Rules
    a. Allows you to set Validation Rules on data so that only clean usable data is recorded.
    b. This makes searching and reporting your data much easier.
    c. These are done by creating formulas.
3. Importing & Exporting Data
    a. Salesforce has many tools embedded in their software that allow for simple importing of data and exporting of data for data manipulation.
4. Abundant Learning Materials
    a. Many conferences, videos and workshops are available to customers to maximize the different features of Salesforce.
    b. AppExchange
    c. Largest CRM app store in the industry and is as easy to navigate as the Apple App Store.
5. Change Management
    a. Allow you to test and develop new features to produce from sandbox into production.
6. In Product Communication
    a. Salesforce Chatter and Tagging features allow you to communicate with team-members and coordinate on reporting.
7. Accessibility

a. Works on major browsers and mobile devices (please see above for more information).

4.3.2 SugarCRM

1. Ease of Use and Adoption
   a. End-Users can set up these dashboards very easily by utilizing out -of the box dashboards or taking any report and using it on your dashboard
   b. Easy Customization due to Drag and Drop functionality to allow end users to customize screen, sub panels and dashboard.
2. Speed & Performance
   a. One of Sugar's main goals, announced at one of their conferences, was to be fast and to emulate the Facebook experience.
   b. Speed can be easily optimized by increasing the bandwidth of your server and database.
3. Advanced Search
   a. Global Search and Full-Word Search is located in their applications that gives users an easy time finding the information they need such as accounts, leads and records.
4. Integration
   a. This application can integrate with social networks (LinkedIn, Facebook, Twitter etc.) and is considered number 1 in this category.
   b. Can integrate with Google Applications (Google Calendars)
   c. Can integrate with IBM.
   d. Can integrate with iCal (Mac Application)
5. Open Source
   a. Paying users of this product can modify the code which means constant security upgrades and features enhancements, although customers rarely make code modifications.
6. Sugar Exchange
   a. If you are looking for a certain feature that is not part of the product, SugarCRM has an app store that gives you options to customize your SugarCRM solution.

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7. Online or On-Premise
    a. You can choose to have it online or have it on premise.
8. Math Calculation & Show & Hide Fields
    a. These features are automatically included in the product to allow for easier data visualization and manipulation.

4.3.3 Bloomerang

1. Ease of Use and Adoption
    a. End-Users can set up these dashboards very easily by utilizing out -of the box dashboards or taking any report and using it on your dashboard
2. Interactive Dashboard
    a. Provides an interactive dashboard, giving the information on the incoming donations this week, the donor retention rate and suggested for improvement.
3. Donor Engagement
    a. Bloomerang has a provision in measuring the donor's engagement based on the past interactions, determining the relationship. This provides the scope of improvement.
4. Importing & Exporting Data
    a. Bloomerang has many tools embedded in their software that allow for simple importing of data and exporting of data for data manipulation. Data can also be easily imported from multiple tools almost from anywhere.
5. Smart Reporting
    a. Bloomerang helps generate comprehensive reports for just a few clicks. Even the finite information can be included and segmented for presentation and planning purposes.
6. Website Integration
    a. Bloomerang consists of powerful website integration features which allow you to track your constituents' browsing activity on your organization's website.
7. Accessibility
    a. Bloomerang constitutes Works on major browsers and mobile devices (please see above for more information).

8. Email Design and Distribution
    a. Bloomerang has inbuilt marketing email templates and gets rich analytics on their performance.
9. Event registration
    a. Bloomerang has simplified inbuilt event creation and management workflow and management. Segregation of the customers is also handled for differentiating the customers and their pricing in the event.
10. Social Listening
    a. Bloomerang provides efficient tools to connect your organization's twitter, etc. accounts for social monitoring, and connectivity.
11. Knowledgeable, US base Support
    a. Bloomerang provides phone support with the technical team in answering the questions.

4.4   System Security

4.4.1 Salesforce

1. Restricting IP's (For Features such as Connect Offline)
    a. If your organization restricts IP addresses, logins from untrusted IPs are blocked until they're activated.
        i.   Salesforce automatically sends you an activation email that you can use to login.
        ii.   The email contains a security token that you must add to the end of your password.
        iii. For example, if your password is mypassword, and your security token is XXXXXXXXXX, you must enter mypasswordXXXXXXXXXX to log in.
2. Two-Factor Authentication
    a. Two-Factor Authentication requires that all login attempts have both login credentials and a second authentication factor.
    b. Login attempts that do not have valid credentials from both sources will not be granted access to Salesforce.
3. TLS 1.1 or Higher

a. Beginning July 22, 2017, Salesforce will require secure organizational connections to use the latest protocol TLS 1.1 or higher to provide a more secure environment and continued PCI compliance.

4. IP Ranges
   a. By using Login IP Ranges, admins can define a range of permitted IP addresses to control access to Salesforce.
   b. Those who try to login to Salesforce from outside the designated IP addresses will not be granted access.

5. Own Domain
   a. The "My Domain" feature allows an organization to add a custom domain to their Salesforce org URL.'
   b. Advantages to this include:
      i. Block or redirect page requests that don't use the new domain name
      ii. Set custom login policy to determine how users are authenticated
      iii. Work in multiple Salesforce orgs at the same time
      iv. Let users log in using a social account, like Google and Facebook, from the login page
      v. Allow users to login once to access external services
      vi. Highlight your business identity with your unique domain URL Brand your login screen and customize right-frame content

4.4.2 SugarCRM

1. Team Roles and Access Privileges.
   a. SugarCRM roles define permissions for users such as what kinds of records they can access and what level of access they are allowed.
   b. These can be configured by the Sugar Administrator.

2. HTTP Connection
   a. SugarCRM requires the usage of HTTPS transport without any exception.

3. Bot Protection
   a. Sugar can protect your instance from bots via CAPTCHA or honeypot protection methods.

4. Directory Services Integration
    a. Sugar supports LDAP or Active Directory for centralized management of passwords across multiple systems.
    b. This allows you to integrate Sugar with the identity management system you already have in your infrastructure.
5. Single Sign-On
    a. SSO allows a user to login just once for affiliated but separate websites.
    b. Sugar provides SAML support for single sign-on (SSO) authentication as another option for centralized management of passwords across multiple systems.
6. Validate User IP Address
    a. Sugar can be configured to forcibly logout if a user's IP address changes during a session.
    b. This prevents hijacking of the session by an attacker who wants to take control of the connection.
7. Prohibit Concurrent Sessions/Idle Timeout
    a. Sugar only permits a username to be logged in under one session.
    b. So, if a user is engaged in a Sugar session and any additional user sessions are started using the same username on a different browser or computer, Sugar will log the user out of their first session.
    c. When a user does not perform any actions in Sugar for a certain period, the user is automatically logged out of the system and will be forced to log back in.

4.4.3 Bloomerang

1. HTTPS Connection operability
    a. Bloomerang as is a web browser based application, it is used via HTTPS, Bloomerang has SSL certificate which transfers data encrypted for security.
2. Secure Encryption Algorithm deployed

    a. Bloomerang uses top industry standards for the secure handling of data online. Bloomerang uses hashing and salting which includes SHA-512, and 6-character salt for salting and securely storing the passwords.

3. Credit card Information secure
    a. As per the PCI compliance, Bloomerang does not allow any payment or application operability on insecure versions of SSL or TLS.

4. Online fraud prevention tools
    a. Limiting the no of online form filling has been built,
    b. CAPTCHA support has been included in the application for avoiding fraud.

5. Non-Disclosure of application information
    a. Bloomerang has built itself invisible of its security algorithms and other application details from the public to prevent data mining from the crackers which could create and expose vulnerabilities.

6. AWS system configuration and auditing
    a. Bloomerang has employed Threatstack for auditing and maintaining the application on Amazon Web Services

Suggested Security Policies

1. Password Policies
    a. The following are the password recommended directly by Salesforce:
        i. Password expiration – Passwords should be set to expire no greater than 90 days, thus requiring users to reset their passwords in that time.
        ii. Password length – Passwords should be required to be at a minimum length of 8-10 characters
        iii. Password complexity – Users should be required to include a mix of alpha and numeric characters in their passwords.
        iv. Users should be told not to include common words in their passwords, such as "password" or names, etc.
        v. Users should be told not to reuse passwords on multiple accounts, as they can compromise one or more than one of their accounts.
        vi. Users should be directed not to share their passwords with anyone, either online or in person.

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2. Educate User's About Phishing
    a. Leverage a Security Awareness Program that teaches the following fundamentals:
        i. Do not click on links or attachments from emails that appear suspicious.
        ii. Do not open suspicious emails.

4.5   Organizational Readiness

Before implementation of the CRM solution, please review the following statements with your organization and assess the validity of these statements:

1. Our organization has a clear vision and plan for the CRM implementation. We have taken the time to understand how the CRM can be used across our entire organization to support internal collaboration, drive innovation and efficiency for our mission.
2. We have strong executive sponsorship necessary to support our adoption and successful transition to the CRM.
3. Our organization has internal team members who understand the capabilities and features of the CRM.
4. We understand the CRM is a powerful tool that can grow with our organizational needs. We plan ongoing investment in our own learning so we can make the most of the platform.
5. We have a skilled resource who understands the flexibility of the CRM and has the experience needed to make sure we will maximize our customization of the CRM to serve our mission. We have budgeted appropriately to be successful with our implementation.
6. We understand that a CRM system that has inaccurate data is not a useful database. We are committed to carefully migrating and maintaining our data.

4.6   System Pricing

4.6.1 SugarCRM Pricing Table

Name	Sugar Professional	Sugar Enterprise	Sugar Ultimate

Price	$40	$65	$150
Differences	Sales automation and forecasting Marketing lead management Support automation Call center automation Reporting & Dashboards SugarCRM Mobile Cloud or on premise deployment 15GB storage Unlimited Studio customizations Unlimited online support Support for MySQL and SQL Server (On-Site)	Revenue Line Item Level Opportunity Tracking Forecasting Product Level Quotes Advanced Workflow Role-based Views 100 Concurrent Customer Self-service Portal Users SQL-Based Reporting Access Support for Oracle and DB2 (On-Site) 12x5 (hours/days) Email and Phone Support 60GB storage	24x7 support Assigned Technical Account Manager Increased storage** 5 sandbox instances**

*user/month billed annually.

4.6.2 Salesforce Pricing Table

Name	Lightning Enterprise Edition + Nonprofit Success Pack (NPSP)	Lightning Unlimited Edition + Nonprofit Success Pack (NPSP)
Price	$36	$72
Differences	Constituent Relationship Management Volunteer Management Donation Management Basic Grants Management Basic Batch Entry Mobile access Content library	Getting Started NPSP Accelerator 24/7 toll-free support Unlimited online training Full copy sandbox Developer pro sandboxes Increased API & storage Additional custom objects Access to 100+ admin services Sales Data Sales Cloud Engage

*user/month billed annually.

4.6.3 Bloomerang Pricing Table

0-1000 Records	1001-5000 Records	1001-5000 Records	15001-25000 Records	25001-40000 Records
$99	**$199**	**$299**	**$399**	**$499**
Full Functionality, **Unlimited** Users, **Free** Email/Chat support, **Free** group training, **Unlimited** online giving pages/forms				
5,000 emails/month	25,000 emails/month	75,000 emails/month	125,000 emails/month	200,000 emails/month
$35/month personal support	$70/month personal support	$100/month personal support	$100/month personal support	$100/month personal support
10GBs file storage	**20GBs** file storage	**30GBs** file storage	**40GBs** file storage	**50GBs** file storage

*No of Storage Records/month based on selection billed annually.

5   Digital Fundraising Platform

5.1   iDonate System Overview

Started its operations from 2011 as a free service to assist charity and fundraisers, with their main primary aim by providing tools for both charity and fundraisers to help raise much needed funds. A platform in creating fundraising pages using iDonate website which allows family and friends to donate to their choice of charity. A combined setup of tools help fundraisers promotes their fundraising pages. It enables donors with 23 different ways of giving. iDonate average donation is about 2.5 times the national average donation size. All donations are securely processed by Realex Payments, and registered, non-profit can accept donations directly using the tool.

5.2   iDonate Hardware and Software Recommendations

Web Browser	Notes & Recommendations

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Google Chrome *(Most Recent Version)*	▪ Chrome applies updates automatically. · iDonate makes every effort to test and support the most recent version. · There are no configuration recommendations for Chrome
Mozilla Firefox *(Most Recent Version)*	▪ iDonate makes every effort to test and support the most recent version of Firefox. · There are no configuration recommendations for Firefox
Opera *(Most Recent Version)*	▪ iDonate makes every effort to test and support the most recent version of Opera. · There are no configuration recommendations for Opera
Apple Safari *(Versions 6 and above)*	▪ There are no configuration recommendations for Safari.
Internet Explorer	▪ It is not available to use.

Operating System	Notes & Recommendations
Microsoft Windows OS (Vista, 7, 8, 10)	▪ iDonate can be operated on any of the Operating system with a latest version of browser
Windows XP	▪ All the support has been excluded with Windows XP, so it is not available for use.
Mac OS	▪ iDonate can be operated on any of the Operating system with a latest version of browser

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Important Notes

1. iDonate uses "cookies" to track your visit – i.e., transfer a small amount of data to your browser by a Web server. This cookie serves as your identification card, recording information you provide. It cannot be executed as code or deliver viruses.

2. iDonate Web servers automatically log the IP/Internet address of your computer, the browser type, and browser version you are using. Under no circumstances does this information identify you personally.

Mobile Configurations

- iDonate can be used upon integration to the donor management mobile software system of any application.
- No mobile application is developed or supported, but all support is present for mobile browser operability of the application.

5.3   iDonate System Usability

1. Online and Text Giving:
   a. Simplified giving forms, and standardized display across all the systems (PC, Laptop, Tab, Mobile, etc.) has increased donor satisfaction, and experience on giving.
   b. Flexible options of recurring donations with multiple options of frequency weekly, monthly, yearly, etc. helps easy accessibility.
   c. Customized thank you and donation receipts can be automatically designed and communicated.

2. Text Giving
   a. Over 90% of the population can be reached with a text message and the message is read in 3 seconds of receiving. So, tapping the potential opportunity the donor giving can be made easy.
   b. Simple text message with a donation amount can be initiated to complete the donation with the link provided.
   c. Keywords can be set up to specify the campaigns for the donation making the process simple with a single message.

3. Peer- peer fundraising

a. This provides a platform to empower your donors to grow awareness, ad get new donors, as donors are the best advocates

b. Easy to use templates are used for communicating the program that can be customized for the needs of the organization. These templates include brand elements and messaging thus empowering the donors

c. This can be organized for individuals, teams, organizations, events, etc.

4. Non-Cash Giving

a. This helps tab the potential of the donor's non-cash assets, as the donor's ability would mostly stand with their property. This potential is about 90% as liquid assets are just about 10% in cash with the donors.

b. The complete process of the physical transfer, selling, receipt, IRS compliance, Risk management, vetting, accounting, tile transfer, etc. is all taken care of with iDonate.

5. Event ticketing, & Registration

a. Here all the event ticketing, event hosting, promoting, fundraising, etc. all can be managed at a one single location,

b. Flexibility of maintaining the event can also be made as this includes no of tickets, no. of ticketing types be used, promo codes for the events, sponsor info, etc.

5.4   iDonate Security

1. Credit card Information secure

a. As per the PCI compliance, iDonate does not allow any payment or application open ability on insecure versions of SSL or TLS.

2. Strong encryption mechanisms

a. iDonate systems employ strong encryption mechanisms for the utmost security of the user's data

b. Support is only employed to secure systems, outdated/ insecure system OS (Windows XP) or browsers (Internet Explorer) are not supported

3. No Data Storage

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a. iDonate systems do not store any sensitive data pertaining to the users in their system, which provides them a leverage

4. API based Public key encryption integration

a. The iDonate platform provides a secure connection between the iDonate payment options and the donor management systems, allowing for the ease of data management

5. Amazon Web Services (AWS)

a. iDonate's PCI platform is completely hosted with Amazon' Cloudfront CDN network.

b. Amazon is a PCI-DSS level 1 complaint service provider. Amazon's Cloudfront service is a global content delivery network hosted and managed by Amazon.

5.5   iDonate Pricing

Basic Package $99/month	Standard Package $199/month	Pro Package $299/month
- Online giving - Campaign & landing pages - Salesforce and Virtuous CRM integrations are included	- Online giving - Campaign & landing pages - Text Giving - Pick 1 from the following to include in this package at no extra cost: Noncash liquidation, events tool, peer-to-peer - Salesforce and Virtuous CRM integrations are included	- Online giving - Campaign & landing pages - Text Giving - Non Cash liquidations - Event tools - Peer-to-peer - Salesforce, Virtuous CRM, and Raiser's Edge integrations are included
As for the processing fees, iDonate customers have 2 choices: **Option 1:** Move to iDonate payment processor – powered by Anovia - No donation fees - Processing fees: 2.99% + $0.45 **Option 2:** Stay with the current payment processor - Add a 1% donation fee to each transaction plus the processing fee you are currently incurring		

6 Office Productivity Suite

6.27   System Overview

Office productivity suites are defined as a group of applications that allow users to perform a myriad of different functions including: creating documents, sending emails, formatting presentations and editing multimedia files. Over the years, these functions have continued to expand by allowing external communications and collaboration which serve to increase user productivity and increase efficiency. There are many options available from paid solutions to free alternatives that can meet the needs of many organizations.

These software packages have become so prevalent in our society that many companies have sought integration options to allow existing customers to map functionality with their applications. One example is the collaboration and contact integration with many of the larger CRM products discussed earlier in this document. In previous years, that integration came in the form of API's that required a higher level knowledge of programming and customization. Today, much of that integration is both simple to deploy and fully supported by the vendors on both sides.

New features are exciting for many businesses that have to support remote tele-workers because it has the potential to reduce costs, increase the level of security and potentially reduce the need for infrastructure that was previously required for users to connect back into the corporate network. Many cloud based options have come into the light in recent years and resulted in rave review from early adopters.

6.28   Challenges Addressed

Traditional office productivity suites have been relatively large applications which are installed locally on a user's computer and require expensive licensing to support each function. Companies have to spend a considerable amount of time and money ensuring that the application is compatible with both the host operating systems and any patches pushed out to the machines. In addition, the ability to push out new applications and functions resulted in performing a task, either manual or automated, to install that software on each user machine.

The next major drawback of traditional office suites in the infrastructure required for collaboration functions, such as E-mail and Chat. Using a product like Microsoft Office required a Mail Server that is set up to support relaying messages to other people. There are, of course, other options but many companies choose to support this legacy communication method due to the control over messages traversing those machines. Issues with confidential information make organizations weary when discussing newer methods for communication.

Many of these legacy issues can be addressed by companies adopting newer cloud based SaaS (Software as a Service) options that reduce many of the pitfalls associated with managing your own software and infrastructure. The potential reduction in cost alone warrants consideration and the overlaying of new security parameters, which are now certified to host critical information (i.e. PCI, HIPAA, SOX, etc…), creates an ever more compelling argument.

6.29 Options

As discussed earlier, there are many options when choosing an office productivity suite. With the paid solutions, the challenge becomes more apparent when discussing the options to be included with your purchase. For example, Microsoft Office 365 Includes five tiers of service in their Non-Profit offerings alone.

It is important to first research which functionalities your employees may need to utilize before making a decision, especially when procuring traditional applications. When choosing traditional software, you should be cognizant of the upkeep required when adding or removing applications and performing software upgrades. It should be noted that choosing a cloud solution allows for the adding and removing functionality quickly and easily with little manual intervention from your application administrators.

6.29.1 Paid Solutions

- Microsoft Office (Traditional Software)
- Microsoft Office 365 (Cloud Based)
- Google Apps for Business

6.29.2 Free Alternatives

- Libre Office
- Google Apps (Free Version)
- Microsoft Office Online
- Apache OpenOffice

6.30 Recommendations

With the wide variety of options available on the market today, the Microsoft Office 365 solution stands out as the best solution for organizations of various sizes. Where this solution shines is the ability for small businesses, like Revitalize CDC, to deploy the application with minimal effort and maintain an operational state for years to come with almost no maintenance or upkeep. The payment structure is also one that lends itself nicely to this version of Microsoft Office because you can really tailor the different pricing tiers to your needs.

This product gives a tremendous amount of flexibility when dealing with unprecedented growth in your organization. Removing the need to constantly support and update applications as well as maintain versions and security will be an incredible value to organizations of any size.

6.31 System Requirements

The system requirements for this solution are very basic. Given that most of the collaboration tools are managed using a web browser, your company only has to maintain the ability to connect to a website. In some cases, like the Revitalize CDC office, minimal amounts of equipment are required to connect to the Microsoft Site and utilize Collaboration tools with other co-workers. Also, since web browsers are supported on all major operating systems, your company will not be tied to a single platform. The wide arrays of platform support can alleviate the strain of having to consider this application when upgrading or migrating to new hardware. Below are the system requirements, which also vary based on what functions you utilize and what license level you purchase.

Operating system	Windows 10, Windows 8.1, Windows 8, Windows 7 Service Pack 1
	Windows 10 Server, Windows Server 2012 R2, Windows Server 2012, or Windows Server 2008 R2
Browser	Safari, Chrome, and Firefox - current version
	Microsoft Edge - latest version
	Internet Explorer - current or immediately previous version
Email client software	Office/Outlook 2016
	Office/Outlook 2013 with SP1
	Office/Outlook 2010 with SP2
	Office/Outlook 2007 with SP3
	Outlook for Macintosh - Office for Mac2016
Computer and processor	1 GHZ or faster x86 or 64-bit processor with SSE2 instruction set
	1 GB RAM (32-bit)
Memory	2 GB RAM (64-bit) recommended for graphics features, Outlook Instant Search & certain advanced functionality
Disk space	3 gigabytes (GB)
Monitor resolution	1024 x 768
	Exchange ActiveSync must be supported for Office 365
Mobile devices	BT Business Email Lite (powered by Microsoft Office 365) requires POP to be supported
Using Outlook Web App on smartphones and tablets	For the best experience use the integrated web browser of these devices, Windows 8 tablet, iOS 6 or later versions for iPhone4s or later versions or iOS 6 or later versions for iPad2 or later versions

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6.32   System Usability

Office 365 had the ability to perform offline functions without access to the internet; this benefits some customers when traveling or otherwise in a position with no internet access. When that access is re-connected, data will transfer silently in the background, ensuring that documents are backed up to your cloud drive automatically. The look and feel of the application stack is almost identical to traditional Microsoft Office applications, although some functions have been added to support collaboration and cloud sharing. Microsoft has also made modifications to the applications for companies moving towards touch screen devices, such as Surface Tablets. On these devices, the look and feel is optimized to allow more efficient use without cluttering the smaller workspaces.

Upgrades mentioned previously in this paper are a huge benefit of this product. When a new version of Office 365 is released, the user's local applications will be patched as soon as it is connected to the internet. This however, may be a downside to the Office 365 platform for large enterprises because of change management procedures or the potential for application integration problems utilizing the new versions. Another potential downside is users that don't feel comfortable with change, there are times where the Office 365 platform will upgrade and modify the way applications behave, albeit in small increments. This may be a negative trait for users that are used to performing functions in a single manner.

6.33   Office 365 System Security

System security is where the Microsoft Office 365 product truly shines. The numerous benefits of this platform warrant a deep dive into the Microsoft architecture but for small businesses a few of the highlights are:

- Microsoft maintains an extremely high level of security for accessing the physical infrastructure at their data centers. This prevents unauthorized access to the storage location of customer data.
- Customer data that is stored in the cloud is encrypted at rest (When not transferring between locations) by Bitlocker, which is a method of encrypting entire volumes of data.

- Data that is being transferred between customers and the Microsoft Data Center is encrypted using SSL/TLS, this prevents users data from being intercepted when transferring over public mediums, such as Public Wifi hotspots.
- Microsoft has an internal policy that prevents them from accessing your personal data for marketing purposes. Other companies utilize this data to fine-tune advertising material but pose a potential risk when storing sensitive data.
- Data that is stored in a Microsoft Data Center is regularly backed up and transferred off-site, this can be useful in situations where the physical Data Center is damaged (i.e. Earthquake, Flood, Fire, etc…)
- Standard policy for user access are strong passwords by default, this will prevent malicious actors from gaining access using weaker keys which are easily obtained.
- Access to the company cloud drives and Sharepoint sites are managed by a portal which can restrict individual users and their privacy settings.
- Some levels of licensing include antivirus scanning of documents which prevent organizations from having to transfer documents to their workstations before performing detecting malicious code.

6.34 Implementation Features & Pricing

Microsoft has numerous plans available for this product that all include some level of support and most security functions by default. It is important that companies perform a thorough analysis of the features before selecting a plan. However, because of the rapid deployment of new functions, you can change these plans as your company grows or you need additional applications. Below is an idea of what the Non-profit pricing model is per month, these programs vary and the feature-sets should be analyzed for consistency.

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Office 365 Nonprofit Business Essentials	Office 365 Nonprofit Business Premium	Office 365 Nonprofit E1	Office 365 Nonprofit E3	Office 365 Nonprofit E5
Donation	$2.00 user/month	Donation	$4.50 user/month	$10.00 user/month

7   Cheat Sheet

7.1   Networking

7.1.1   Network Analyzers

Check your respective app stores for freely available analyzers. User to ensure your network is safe and effectively set up to avoid interference.

7.1.2   VPN Router

The VPN router will help you secure your communications from wherever you are. The following link provides instructions on how to set up the recommended router on a Mac Laptop. Consider purchasing the static IP address from Comcast.

https://www.vpntracker.com/cms_components/media/vpnt/VPNT_Interop_Howtos/1119/Linksys_LRT2x4_VPN_Tracker_7.pdf

7.1.3   Wireless Access Point

If there are no issues with connectivity then or a desire to expand capabilities, there may be no business need for this system.

7.1.4 Cloud Solutions

Jump Cloud is free for organizations with under 10 users and can help you track user accounts across many of the systems Revitalize is likely to utilize. You may also utilize their RADIUS server for WPA2 Enterprise on your current Comcast Business Wireless Gateway.

https://jumpcloud.com

7.2 System Security

7.2.1 Antivirus

Easily deploy and manage this solution from a single web based interface; free trails are available at the following link.

https://www.bitdefender.com/business/security.html

7.2.2 Encryption

Your operating system may have come with pre-installed encryption software. If not GPG4Win and GPGtools (in beta) are free options; confidential data should remain encrypted on laptops in case of loss or theft. Don't lose your keys or passwords, you will be unable to recover the data.

https://www.gpg4win.org

https://gpgtools.org/

7.2.3 Recovery and Policy

These are no cost solutions, other than the storage drives, and will dramatically increase your current security posture even if no other solutions are implemented.

7.3 CRM

7.3.1 Free Trails

Bloomerang: We have contacted the vendor regarding the application and the necessary details, and an offer for a free demo has been made from their end. Below are the contact details of the Point of contact.

Gabriel Harkov – gabe.harkov@bloomerang.co

For iDonate application, we have contacted the vendor regarding the application and the necessary details, and an offer for a free demo has been made from their end. Below are the contact details of the Point of contact.

Shelby Howard – showard@idonate.com

7.3.2 Training

Implementing any CRM solution will take dedication to the system, solid training and persistence. The following link provides free training provided online by Salesforce.

https://trailhead.salesforce.com/

The CRM solution of Bloomerang has online videos which provide the overview of the application regarding its operability and the available features. The application offers free group training upon subscription. The following link provides their YouTube channel and some informative videos regarding the product and application overview:

https://www.youtube.com/user/bloomerangtech/videos

The iDonate System has its interconnection with the donor management systems thus providing multiple options for the NGO orgs in providing to their donors. The below is the link for iDonate related information.

https://www.youtube.com/channel/UCV-mFPV-ojXyyC3sQ943eug

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