

Volunteer Me!

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Abstract — VolunteerMe is a website designed to make volunteering easier than ever before. Instead of not knowing who needs help and having to find out the old way, which often involves internet searches and phone calls, VolunteerMe gives users one central place where they can keep track of their volunteering efforts quickly, so more time can be spent actually making a difference as opposed to figuring out how to make a difference.

I. INTRODUCTION

Social networking at this point has been primarily used among friends to send jokes and post funny pictures. But what if the power of social networking could be used to make a real difference? Everyone likes the idea of volunteering, but most don't really know where to start. It's not always as easy as making a phone call. In real life, you have to start by finding an organization that matters to you. Next you have to call the organization to find out if they even need volunteers, find out what day and time, and then see if it fits in your schedule. Repeat the process and you begin to see the problem. There's a ton of overhead just to help the community. It should be easier to help!

Let's face it, most people are lazy. If volunteering were easier, more people would do it! The best way to make it easier is to unify the system, and make it easy for both parties to connect with each other.

The core idea of this project is to create a website / mobile app that tells volunteers what charities and organizations need their help and when. For example, if a user likes animals, he could browse by category to see what organizations are looking for volunteers to help animals. Or, he may want to browse by time. Let's say he has no plans for Saturday. He could look to see if volunteers are needed this Saturday in his town. These examples could be combined for even more specific scenarios. Starting the process is as simple as registering, which takes only minutes. From there, the home page offers helpful suggestions on where to volunteer, so the hardest part is already done. If the user doesn't like the

suggestions, they can search on their own based on time, interest, skill and/or a combination of these things. Signing up for an event takes only the click of a button. Once the hosting organization has approved the volunteer for the event, they are good to go!

Beyond the basics, concepts like groups make it easy to volunteer with friends and also easy for the event hosts to track data such as the hours worked by each volunteer.

For those who can't find the time to sit in front of a computer, there is an Android app that compliments the website, offering some useful basic functionality on the go.

II. MOTIVATION

Our motivation behind the project was to use technology in a positive way that would actually affect someone's life, which is accomplished through volunteering. Our goal is to make VolunteerMe an invaluable tool that real people use. Starting a project and taking it from the backend to client side code has been a tremendous learning experience. There are so many technologies that come into play; VolunteerMe provides an exciting opportunity for that reason alone. Considering how web development is the foundation of so many tech companies, this project will help us all succeed into the future.

III. SEARCH

To make searching as successful as possible, the primary goal was to offer not one, but many different ways to search, such as interest, skill and time. There are enough interest and skill options to appeal to just about anyone. A few examples of interests are animals, technology and helping youth. Some skills include computer proficiency and carpentry. But the user isn't just bound by a single search choice. They can pick multiple ways to search at the same time, with the most relevant result appearing first. For example, a user can choose a specific interest and / or skill from a drop down list and also search by date at the same time, returning events that match the volunteer's skill set within a specific time frame.

IV. WEB DESIGN

Immediately we knew we wanted the design to be simple and clean. Taking a hint from other popular

websites, we wanted images that are flat and modern in appearance. Although we do not have a graphic artist on the team, the goal was still to achieve an appearance that is attractive, as the appearance is the first impression made on a user when they visit the website. As for a color scheme, we decided on blue, which most people find attractive or neutral. One of the design challenges was finding a color balance and designing a decent interface that was user friendly yet simple and easy to implement. PrimeFaces definitely helped by providing components that can easily be expanded on, making them our own unique creation. Thus, speeding up the development process while increasing efficiency.

V. EVENTS

Volunteer events are designed to include all the information upfront. For example:

- Event name
- Description
- Dates
- Times
- Skills
- Interests

Once the user has selected a few events, the system remembers them and the user can go back any time to review an event they have signed up for. This way they can see how many hours they were verified to have worked.

Another great feature is suggested events that pop up as soon as the user signs in. So they don't even have to conduct a search if they don't want to. The information is there and ready to use. The system automatically selects relevant events based on things like date.

VI. INTERESTS

VolunteerMe tries to be as flexible as possible and offers a large number of interests a volunteer can choose from. In our attempt to be versatile and inclusive, we have:

- Disaster Relief
- Hunger
- Disabled
- Computers
- Community
- The Arts
- Human Rights
- Senior Citizens
- Saving the Planet

- Literacy
- Youth
- Animals

A walk through example would begin with the volunteer setting up an account and selecting things they are interested in to get started. If they change their mind, they can easily add or remove interests on their profile page. Selected interests are saved so they can be used again later for searches.

Interests are used by Organizations and Groups as well. A volunteer can see if they are a good fit for an organization or group and vice versa. In other words, interests and skills can be used almost as a screening mechanism for potential volunteer candidates.

VII. SKILLS

Skills give an organization or group an idea of what the volunteer is good at and how best to take advantage of their assistance. We add new skills frequently. Here are a few of the basics.

- Electrical
- Culinary
- First Aid
- Construction
- Painting
- Technology
- Carpentry
- Pet Grooming
- Social Skills
- Veterinary
- Driving
- Cleaning

Skills can be used in a similar way as interests to match volunteers to events. Some volunteer events may have a skill set that is required so the volunteer would need to have it selected in their profile in order to be considered. There's no limit to the number of skills an event may require or a volunteer may select.

VIII. APPROVAL PROCESS

Although organizers are thrilled to have as many volunteers as possible, in reality, sometimes they need volunteers with specific skill sets or can only take a limited number of volunteers. So after a volunteer has signed up, they appear in the organization's event management pages and must be approved. This is a simple

process of reviewing the volunteer's profile and deciding if they are a match. This, along with a rating system, allows organizations to pick the best volunteers possible.

IX. ORGANIZATIONS

Besides volunteers, another type of account is for the organizations that host volunteer events. Organizations have an administrator and moderators to help manage events and approve volunteers. A volunteer account can act as the administrator of an organization. This way a volunteer doesn't have to separate their accounts if they work for a non profit. Organizations must provide data such as name, description, phone number, email address, etc.

X. GROUPS

A great feature of VolunteerMe is the ability to join a group. A group is a collection of volunteers that usually volunteer together, although they don't have to. They often share the same interests or a similar skill set. They may belong to the same church, school or club. Unlike organizations, groups don't organize events, they just participate in them together. Groups are a way of working with friends toward a common goal of collecting the most community service hours.

Groups also make it easy to find someone. Instead of having to do a search, if the user knows someone is part of a group, they can find them listed on the group page.

A good example of a group might be a school club. Whenever they volunteer, they want all of their members to be accounted for in the registration process which VolunteerMe would provide. This would be an excellent way for them to compete with other groups, say another school club, since the website would track all of the hours volunteered by each club.

XI. POINTS

To encourage people to volunteer as much as possible, VolunteerMe has a point system. Volunteers earn points whenever they participate in an event. The goal is to provide an incentive for people to volunteer. Points will be given based on the number of hours volunteered times a multiplier that might be added for special events. Even something as simple as a point system can go a long way toward getting people excited about volunteering. Leaderboards show how many points have been earned by

whom and inject a little bit of competition into the act of volunteering, hopefully resulting in more people signing up. By doing so, a group can see who has the most points among its members or even hold a competition of their own to outdo one another.

XII. RATING

Each volunteer has a rating which can be viewed on their page. The purpose is to let other volunteers, groups and organizations know how the user has performed in the past. It's kind of like a ranking or reputation system. Ratings are influenced by events and the organization the volunteer has worked with. The system goes both ways. An organization administrator can also have a rating. For example, if an organization has a poor rating, a volunteer may not feel comfortable or trust the organization enough to actually volunteer. We hope volunteers, groups and organizations use this feature to build trust between one another.

XIII. DATA

One feature we believe a lot of organizers are looking for is the ability to easily track data for each volunteer. Some schools or churches require members to volunteer a certain number of hours and need an easy way to keep track of it all. VolunteerMe does this for each member every time they volunteer, simplifying the process. Only an administrator or moderator of an organization can credit volunteers with hours worked. In other words, the task is left to trusted organizations.

XIV. CALENDAR

Each account has a calendar that shows upcoming events at a glance, helping someone plan out their day week or even month. The events on the calendar can be clicked on for additional details. The calendar is a great way for a volunteer to see their upcoming schedule for



volunteering quickly, so that they can add more volunteering opportunities to it without worrying about conflicting schedules.

XV. ANDROID

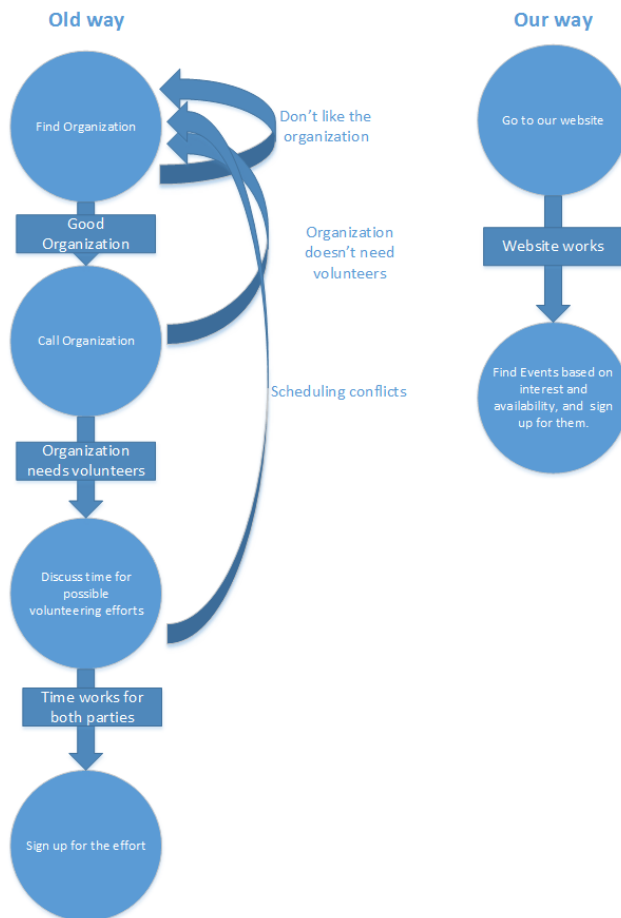
The idea behind the Android app was not to copy the complete website but provide the core functionality so VolunteerMe can be accessed even away from a computer. Currently, users can register, look up events they've already signed up for, search for new events, and then sign up for the chosen event right on the spot.

XVI. ANDROID TECHNOLOGY

The technology behind Android involves the following:

- Java
- XML
- Java Servlets

The layout of the Android app uses standard Android



API classes that the user should be familiar with such as a NavigationDrawer which slides out from the side when the user flicks the screen. The forms on Android are simpler due to smaller device screen size. There are a few things that make the Android app different from the website. For starters, it has a background that greets the user with motivational quotes intended to get the user excited about volunteering.

XVII. HOLO LIGHT THEME

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XVIII. SECURITY

The website takes security seriously. All passwords are hashed using a random salt value and a technique called key stretching. Not much sensitive information is actually stored. However SSL is still used to establish a secure link between the client and server. Tokens are used to log into the Android app so the user doesn't have to keep logging in repeatedly. Each time the app is started, a new token is generated and the old deleted.

XIX. KEY STRETCHING

A technique used to prevent against brute force attacks (those used to find passwords) is known as Key Stretching. A brute force attack works by guessing the password over and over again until finally a guess is successful. Key stretching protects against this by hashing the same password multiple times, making it much harder and time consuming to guess the password [1].

XX. TECHNOLOGY

VolunteerMe uses a variety of technologies to tie everything together. Java is used on the server side and primarily generated HTML on the client side. But many other technologies play a role such as:

- JSF
- PrimeFaces
- Hibernate and HQL

- MySQL
- Amazon EC2
- Ubuntu
- JQuery
- Javascript
- And more!

One of the challenges of a complex web application is the number of technologies and ensuring everything works together properly.

A. Hibernate

Hibernate is an ORM (Object Relational Mapping) technology that maps databases to Java objects. It handles persistence, automating a lot of tasks that would be time consuming and complicated for the programmer to do by hand. Hibernate caches information making it much more efficient by default than MySQL. Hibernate also returns actual class objects from queries and accepts class objects when persisting, saving a great deal of time, mapping the two by hand [2].

B. PrimeFaces

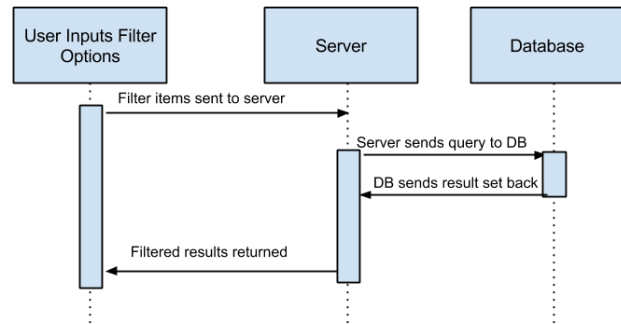
PrimeFaces is an open source JSF (Java Server Faces) library that offers over one hundred components and has AJAX built in. With PrimeFaces, many complex objects such as data tables are greatly simplified by using pre-made components. Any of the components can be themed to match the look and feel of the website. The components in PrimeFaces are very clean and offer a lot of useful tools, like time-pickers and drop down menus, so we could avoid importing 100 libraries for different quirky components [3].

C. Amazon EC2

Amazon Elastic Cloud computing is a virtual machine service in the cloud. It is elastic meaning the amount of resources allocated on the server can be changed dynamically. The server is running on an Ubuntu virtual machine. Amazon web services has the following advantages [4]:

- Reliable infrastructure
- Strong security measures
- Easy to set up and scale
- Dedicated IP that can be mapped to a domain

D. Web Service



The web service for the Android portion of the project uses Java servlets that act as a middleman between Android and the MySQL database. When a database query is made, the process starts by ensuring an internet connection is available, then contacting the servlet with parameters that are part of the query. For example, a volunteer query might contain the volunteer name as a parameter. The servlet runs the actual query using HQL (Hibernate Query Language). The result is returned to the Android app.

E. JQuery

JQuery is a library built on top of Javascript. It's popularity comes from its ability to simplify development, possessing the ability to turn many lines of Javascript into a single line of code. JQuery can be used for animation, in conjunction with AJAX, DOM selection and CSS manipulation [5].

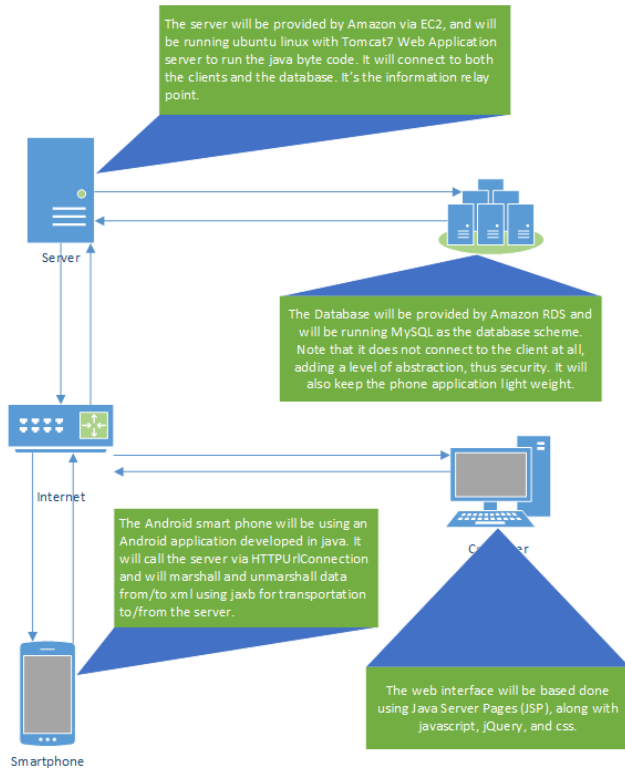
F. JSON

JSON stands for JavaScript Object Notation. It's lightweight and handles data exchange. JSON makes parsing easy. Although JSON is language independent, its coding conventions are not unlike C languages. It works by using name / value pairs, similar to a hash table. The result is an ordered list. Because JSON uses simple data structures, most modern programming languages support it [6].

G. GSON

Although we considered using JAXB or SimpleXML, instead we chose GSON. It was developed by Google for internal use. It works by mapping Java objects to Javascript Object Notation instead of XML. This is how we pass data to Android, avoiding tedious parsing [7].

H. TOMCAT 7



Apache Tomcat is popular because it is open source and light weight. It contains a Java Servlet container known as Catalina and uses an HTTP Protocol, called Coyote, that listens for a connection on a TCP port. Once the connection is established, the request is forwarded to the Tomcat engine to be processed. We chose Tomcat 7 for our project for the following reasons [8]:

- It is lightweight, capable of running on an inexpensive EC2 server instance.
- Tomcat supports servlets and has JSP built in. By adding jars, Hibernate and JSF support is achieved.
- Installation and set up on Linux is easy.

1. MySQL Workbench

MySQL stands for My Structured Query Language. It is a relational database management system that is popular, widely used and supported on Amazon RDS, so the two technologies complement one another. MySQL Workbench makes it easy to create tables, delete tables, add columns, delete columns and do the same with rows. It supports constraints on foreign keys, providing an easy to use interface. Adding to the database is straightforward and doesn't actually involve any queries. Other companies that use MySQL Workbench are Facebook, Twitter and LinkedIn [9].

XXI. TECHNICAL REQUIREMENTS

The website must have Java enabled. But other than that, anyone can access it online. The android app requires Honeycomb or greater. However, due to budget constraints, so far it has only been tested on Jelly Bean. An internet connection is required. Honeycomb was chosen because that's when Google introduced modern features to Android such as the Navigation Drawer that slides out from the side and the Holo Light theme.

XXII. CHALLENGES

One of the hardest things is simply learning all the different technologies that go into the project. Unlike a pure Java application, complex web development has many intertwining pieces, all with programming quirks of their own. On the Android side, connecting to the internet and the database was a little harder than a typical website because a web service had to be built, which interfaced between Android and the actual database. Since Android does not support Hibernate, the database calls cannot be done directly on the device.

XXIII. INTO THE FUTURE

For the future, we hope to polish the user interface even more. A graphic designer on the development team would be ideal. An iPhone or tablet version of VolunteerMe is also a possibility.

XXIV. MISSION STATEMENT

The goal of VolunteerMe is to get real people interested and actually use it, enough to make a real difference not only in the immediate Orlando area but hopefully with hard work and persistence, beyond.

XXV. CONCLUSION

Finding somewhere to volunteer where the participant feels comfortable and fits their interest / skill set can be time consuming. VolunteerMe makes this task easier by providing simple, instant management of volunteer organizations and volunteers. Quoting our slogan, "Helping you, help everyone!"

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