Fayetteville Public Library Volunteer Time Tracking & Management System

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Problem

An average of 220 volunteers work on a variety of projects at the Fayetteville Public Library.

The library needs us to create a new volunteer time-tracking and management system to help quantify the impact volunteers make on library programs and events as well as the impact made on patrons' experiences at the library.

Objective

- Build a modern web application compatible with Android and iOS systems that improves user-experience both at the library and off-site
- User-friendly application will incorporate Human Centric Design, geofencing, and QR codes check-in for on-site projects as well as handle large scale events and a large number of volunteers
- Also, it will track volunteer activities and allow for bulk additions and removals

Problem (Continued)

- The new system should improve the user experience for the volunteers as well as quantify data in a succinct manner.
- The resulting application should ideally be white-labeled and transferrable to other non-profits or libraries.
- Without a solution to this problem, the library will lack an up to date, usable way of quantifying the impact of volunteers.

Background

- Key Concepts
  - Python Django
  - Flutter
  - Material Design Google
  - PostgreSQL & Ubuntu

Python Django

- Django is a high-level python web-framework used to create web apps rapidly and smoothly.
- Used for the creation of the website that both admin and volunteer level users can access.
- The framework has improved security features such as protecting against SQL injection and automatically encrypting passwords.

Flutter and Material Design

- Flutter is open-source and used as a convenient tool to create cross-platform applications for both mobile and web, developed by Google
- Flutter allows you to create a native mobile application with only one codebase, meaning Flutter can be used to create the same app for both iOS and Android
- Material design, also developed by Google, uses grid-based layouts, animations, and transitions to create a consistent and fluent user interface

PostgreSQL & Ubuntu

- PostgreSQL is an open-source object-oriented database, that has been used for 30 years, known for reliability, and performance
- Ubuntu is the operating system that will be used to interact with our PostgreSQL database. Ubuntu is also a free and open-source software

Background (Continued)

- Related Work
  - Many clubs at UofA currently use a volunteer tracking website, GivePulse, that allows users to clock in/clock out and register for events.
  - A problem with GivePulse is that they have their own database of registered accounts, so we could not possibly import any existing volunteer data (names/addresses/passwords) to GivePulse.

Design

- Requirements and Design Goals
  - Web and mobile applications (Android and iOS)
  - User-friendly login screen and user interface for new and existing users, and admins
  - Volunteers will be able to log their hours using the mobile app, in combination with a QR code.
  - Volunteer information (personal, and volunteer time) is automatically submitted to library database
  - Web/mobile application will allow admin users to manage volunteers and volunteer opportunities
    - Add and or remove volunteer hours to specified individuals
    - Add or remove volunteers
    - Add or remove volunteer events

Design (Continued)

- High Level Architecture
  - The application will be available for web access and also Android and iOS devices
  - For the front end, we will use Python Django, Flutter and Material Design by Google.
  - For the database, we will use Ubuntu PostgreSQL

Design (Continued)

- Deliverables
  - Design Document
  - Database schema
  - Database code
  - Web Application
  - Android & iOS applications
  - Final Report

Design (Continued) - Risks

Risk	Risk Reduction
Breach of Sensitive Information	Hash user passwords and use secure programming practices
Bad Database Design for Storing User Info	Provide documentation for database, normalize data, choose proper primary keys, and use good naming conventions
Hard to Maintain Code/Disorganization Between Team	Provide good documentation, use GitHub for collaboration, practice good coding techniques

Tasks and Timeline

Tasks	Dates
Visit library to understand the process needed to be currently taken by volunteers	11/01-11/05
Understand how the library currently organizes its systems	11/08-11/12
Discuss and design the high-level view and expected features of the application with sponsors	11/15-11/19
Learn Flutter and how to build applications with it.	1/18-1/21
Begin the implementation of front end, bare bone implementation	1/24-2/4
Begin the implementation of back end	2/07-2/18
Align existing library volunteer database with back-end implementation	2/21-2/25
Finish implementation of front end	2/28-3/04

Tasks and Timeline (Continued)

Tasks	Dates
Test back end of the application	2/28-3/04
Link together front end and back end containing database	3/07-3/11
Test system as a whole	3/14-3/16
Begin port to mobile applications	3/17-3/31
Begin aesthetic design of front end and mobile apps	4/1-4/8
Test mobile apps	4/11-4/15
Final tests	4/22-4/26
Final polish	4/27-4/30
Documentation	5/02-5/04

Key Personnel

- Chris Moody – Current director of IT/AV departments at the Fayetteville Public Library
- Carlye Dennis – Current Community Engagement Manager at the Fayetteville Public Library

References

- [1] Django, https://www.djangoproject.com/foundation/
- [2] Flutter, https://flutter.dev/docs
- [3] Material Design, https://material.io/
- [4] PostgreSQL, https://www.postgresql.org/about/
- [5] GivePulse, https://www.givepulse.com/
- [6] Ubuntu, https://ubuntu.com/