Operational Concept Description (OCD)

Field Progress App

Team 04

Akanksha Diwedy   *Operational Concept Engineer*

Aishwarya Joisa   *Feasibility Analyst*

Kevin Grimes   *IIV&V*

Madhavi Shantharam   *Life Cycle Planner*

Mayank Kulkarni   *Requirements Engineer*

Sahithi Reddy   *Software Architect*

Uche Uba   *Program Manager*

10/27/2019

Version History

Date	Author	Version	Changes made	Rationale
09/28/19	Akanksha	1.0	• Original template	• Initial draft for Field Progress OCD documentation
10/13/19	Akanksha	2.0	• Added section 3.2, 3.3, 3.4	• Determining the information from the conditions agreed upon during win-win negotiations.
10/17/19	Akanksha	2.1	• Updated section 2.3, 2.2, 3.2, 3.3	• Changes in tech stack for including full stack application potential.
10/27/19	Akanksha	3.0	• Updated section 2.3, 3.3	• Evolving the document to the status as Development Commitment.
12/3/2019	Akanksha	4.0	• Updated sections 1.1, 1.2, 2.3	• Evolving the document for final deliverables.

Table of Contents

Table of Tables

Table of Figures

1. Introduction

1.1 Purpose of the OCD

This document provides, in detail, the shared visions and goals of the success-critical stakeholders of Field Progress Application.

This document has the following objectives:
- *Describe the proposed web application in terms of the requirements.*
- *Describe the way the campaign managers will interact and use the system to benefit their efficiency in turf cutting.*
- *Communicate qualitative and quantitative system characteristics to all stakeholders.*

The success-critical stakeholders of the project are Issac Wang, Evan Shulman, Nikolaj Baer as clients; Campaign managers as users and members of Team 04 in CSCI 577a 2019, as the developers.

1.2 Status of the OCD

The status of the OCD is currently at the version number 4.0. The current system has been analyzed and the operational concept of current system has been accessed. The scope of the new system has been re-evaluated to accommodate the challenges faced during foundation and development phase of the project. It has been updated as a part of TRR package.

2. Shared Vision

Table 1: The Program Model

Assumptions			
• Current turf cutting process in not necessarily efficient.			
• Current system is too expensive and not easily accessible or available for smaller campaigns.			
• Volunteers will be able to talk to most of the voters assigned to them during their availability.			
Stakeholders(Who?)	**Initiatives(What?)**	**Value Propositions(Why?)**	**Beneficiaries(For whom?)**
• Clients • Campaign Managers • Developers	• Design and develop a web application • Implement turf cutting algorithm	• The need for a better turf cutting process for campaigns. • Increasing the number of voters to be reached and spoken to.	• Campaign Manager • Volunteers • Candidates
Cost		**Benefits**	
• Development costs • Maintenance costs • Database storage		• Measuring voter turnout • Increase in number of voters being reached to by the volunteers	

2.1 Benefit Chain

Assumption
Current turf cutting process not efficient.
Current system is too expensive
Not easily accessible or available for smaller campaigns.
Volunteers will be able to talk to most of the voters assigned to them during their availability.

Stakeholders

Outcome

Process

Campaign Managers

Use the application

Visualize the turfs within precincts

Take voter data and volunteer information as input

Design and develop a web application

better turf cutting process for campaigns.

More voters covered during campaign

the number of voters to be reached and spoken to increases

Cluster the voter data into turfs

Developers

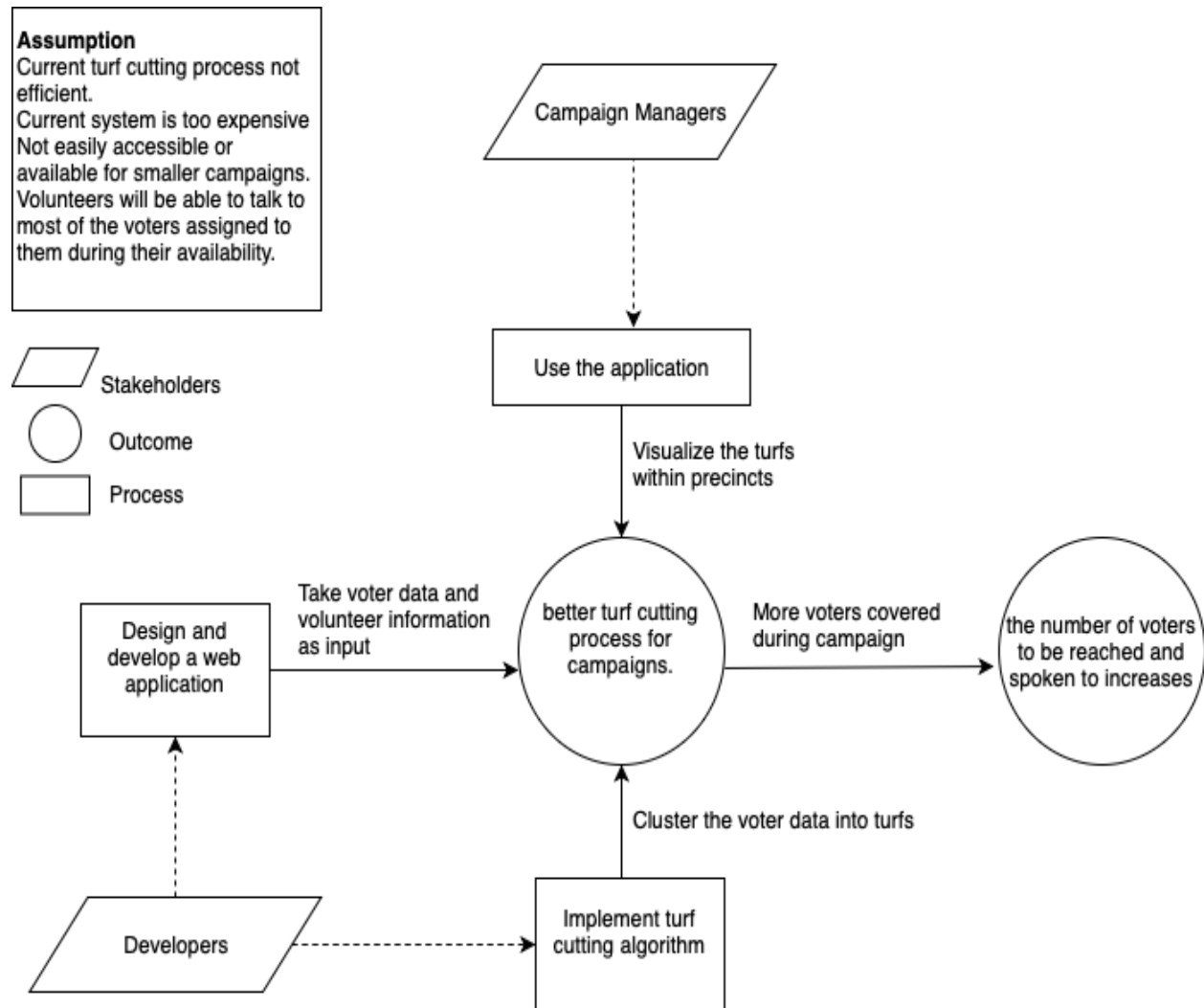Implement turf cutting algorithm

Figure 1: Benefits Chain Diagram

2.2 System Capability Description

Problem: Existing Auto cutting doesn't always reflect the terrain and neither do they take "walkability" factor into account.

- *The field progress web app is a user-friendly mapping tool for Field Directors and Campaign Managers to streamline their turf cutting process and make their campaigns efficient.*
- *Through this application, the aim is to increase the voter turnout given that it can be increased with high quality face to face interactions.*
- *Efficient turf cutting algorithm which can take into account all possible limitations of volunteers and geography*
- *The app should be able to take voter data, volunteer information as input and then determine possible and efficient turfs within one precinct.*
- *Visualization of such information and the results of turf cutting algorithm is the final part of the task for this application.*
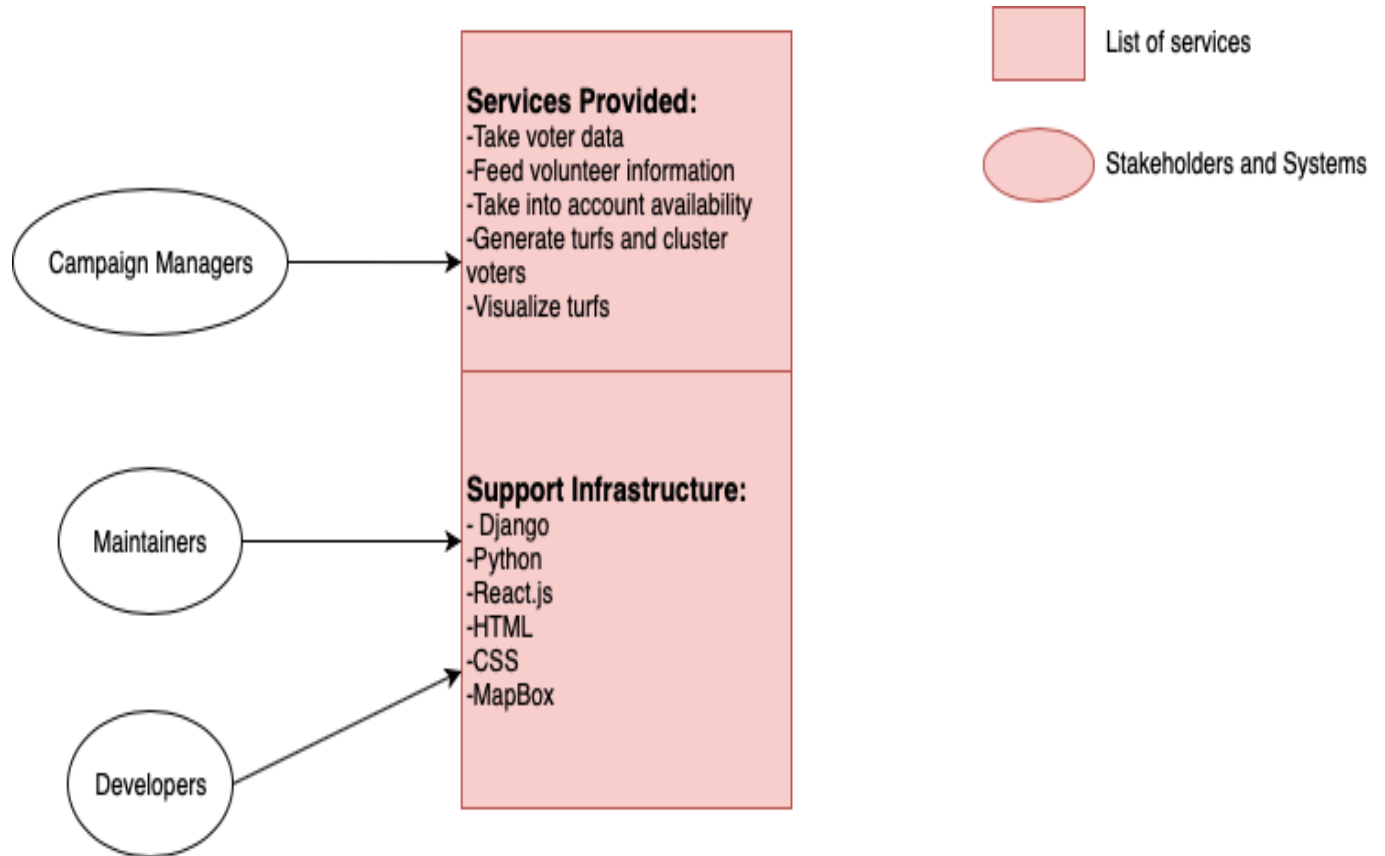
2.3 System Boundary and Environment

Services Provided:
-Take voter data
-Feed volunteer information
-Take into account availability
-Generate turfs and cluster voters
-Visualize turfs

Support Infrastructure:
- Django
-Python
-React.js
-HTML
-CSS
-MapBox

Campaign Managers

Maintainers

Developers

List of services

Stakeholders and Systems

Figure 2: System Boundary and Environment Diagram of Field Progress App

3. System Transformation

3.1 Information on Current System

3.1.1 Infrastructure

The current infrastructure is that the campaign managers maintain an excel sheet of voters. They divide the excel workbook into different sheets with every sheet including voters belonging to a particular precinct. After this, they manually assign volunteers to every precinct.
Apart from Microsoft excel no other software is being utilized which is very time consuming and requires a lot of manual effort.

3.1.2 Artifacts

Table 2: Artifacts

Artifact	Description
Excel Workbook of voters	*The voter's information and location is maintained in an excel workbook structured format for all the manual division of voters into precinct.*

3.1.3 Current Business Workflow
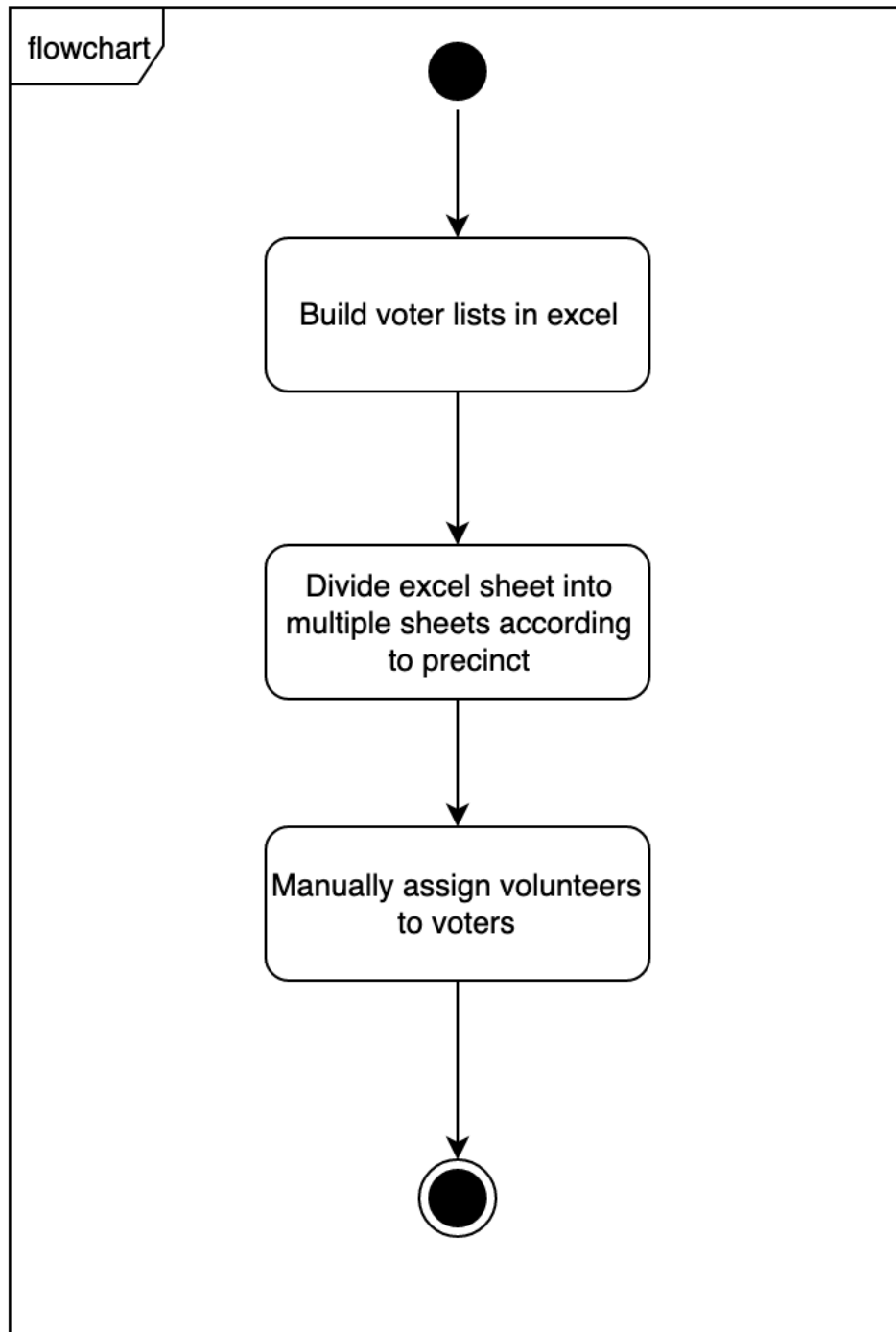
3.2 System Objectives, Constraints and Priorities

3.2.1 Capability Goals

Table 3: Capability Goals

Capability Goals	Priority Level
OC-1 Take Voter Data as Input: *The system is capable of taking the voter data as input in a csv format.*	*High*
OC-2 Take volunteer information as Input: *The system should be capable of taking all volunteer information including their limitations in terms of availability and walkability.*	*High*
OC-3 Create clusters and generate turfs: *The backend system provides the ability to utilize the input information and create efficient clusters of voters and then assign the clusters to volunteers/set of volunteers.*	*High*
OC-4 View turfs: *The module provides the campaign managers the ability to visualize the turfs in an interactive map.*	*Medium*

3.2.2 Level of Service Goals

Table 4: Level of Service Goals

Level of Service Goals	Priority Level	Referred WinWin Agreements
Cross Browsers Support: *support IE 8 and above, Firefox 4 and above, Chrome 16 and above*	*High*	**LOS-1**
Mobile Support: *support for accessing the application from mobile*	*Medium*	**LOS-2**
Memory Scalability: *able to scale to large amount of input data without overflow*	*High*	**LOS-3**

3.2.3 Organizational Goals

OG-1: *Decrease the time to campaign in various regions using volunteers.*
OG-2: *Increase the voter turnout with increase in the number of voters reached out to or spoken to during campaigning.*
OG-3*: Make efficient campaign management tools available to smaller campaign directors.*

3.2.4 Constraints

- ***Browser Compatibility:*** *The application should be compatible with commonly used browsers like Chrome, Firefox, and Safari.*
- ***MapBox Compatibility****: MapBox API allows efficient route between a minimum of 2 and maximum of 12-point locations on the map.*
  This generates the need of hierarchical clustering.
- ***Monetary Funds:*** *Limitations in terms of funds doesn't allow use of Google Maps API because it starts billing after certain number of API calls.*

3.2.5 Relation to Current System

Table 5: Relation to Current System

Capabilities	Current System	New System
Roles and Responsibilities	· *Campaign manager/ volunteers performing manual turf cutting procedure.*	· *Campaign manager/volunteers can use new system and get automated efficient turfs.*
User Interactions	· *Campaign manager make verbally informs volunteers their turfs and the voters they should cover.*	· *Campaign managers can input volunteer information and after generating turfs allocations is done automatically based on their availability.*
Infrastructure	· *List of mapping voter to volunteers and turfs.* · *No visualization*	· *Interactive map visualization.* · *Clustering done on intelligent parameters.*
Stakeholder Essentials and Amenities	· *Turf information is stored in campaign manager's computer or emails.*	· *Turf information is stored in the backend and complete view visible to campaign manager whereas turf view visible to allocated volunteer.*
Future Capabilities		· *Include walkability and terrain/geography limitations into the system algorithm.*

3.3 Proposed New Operational Concept
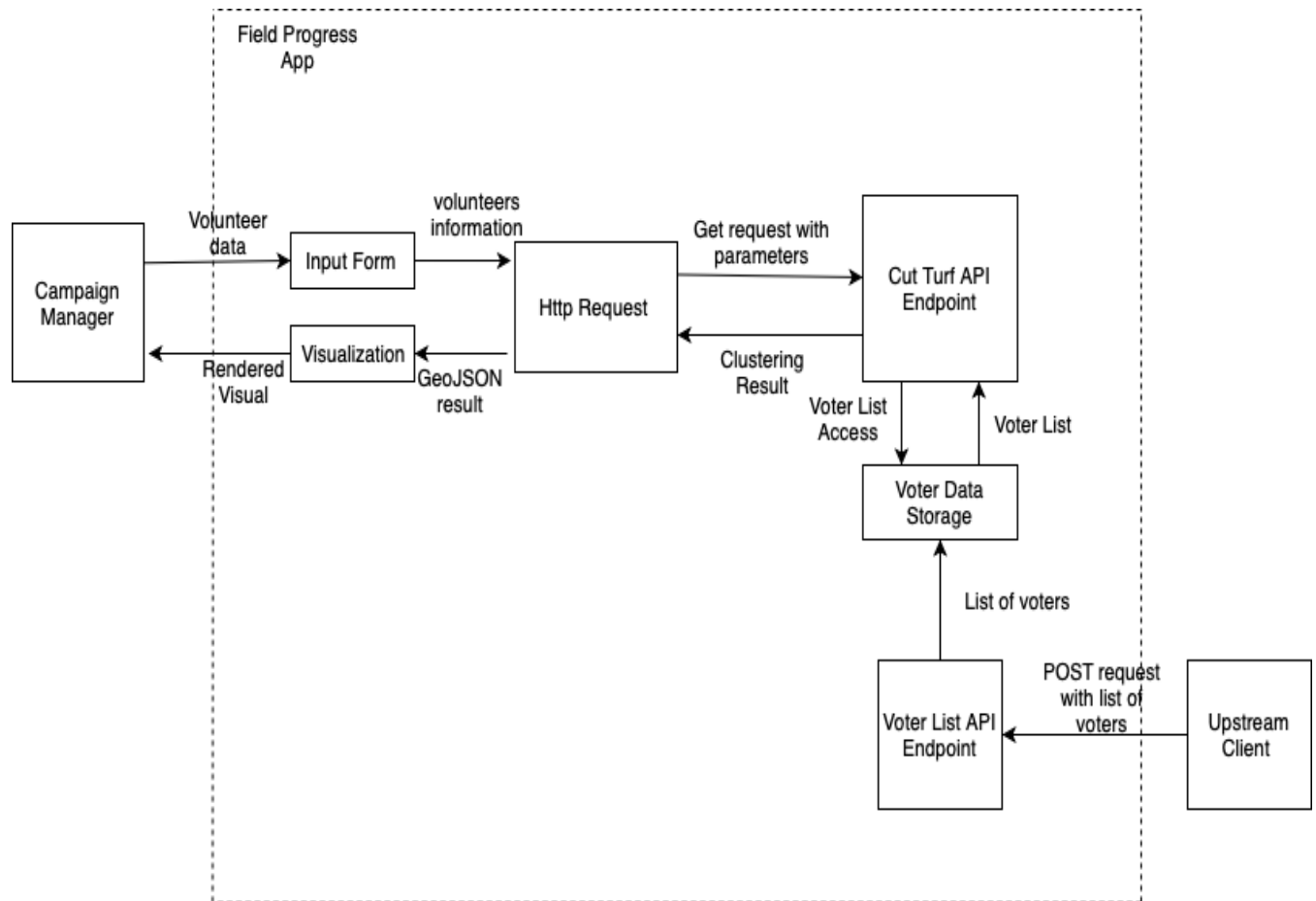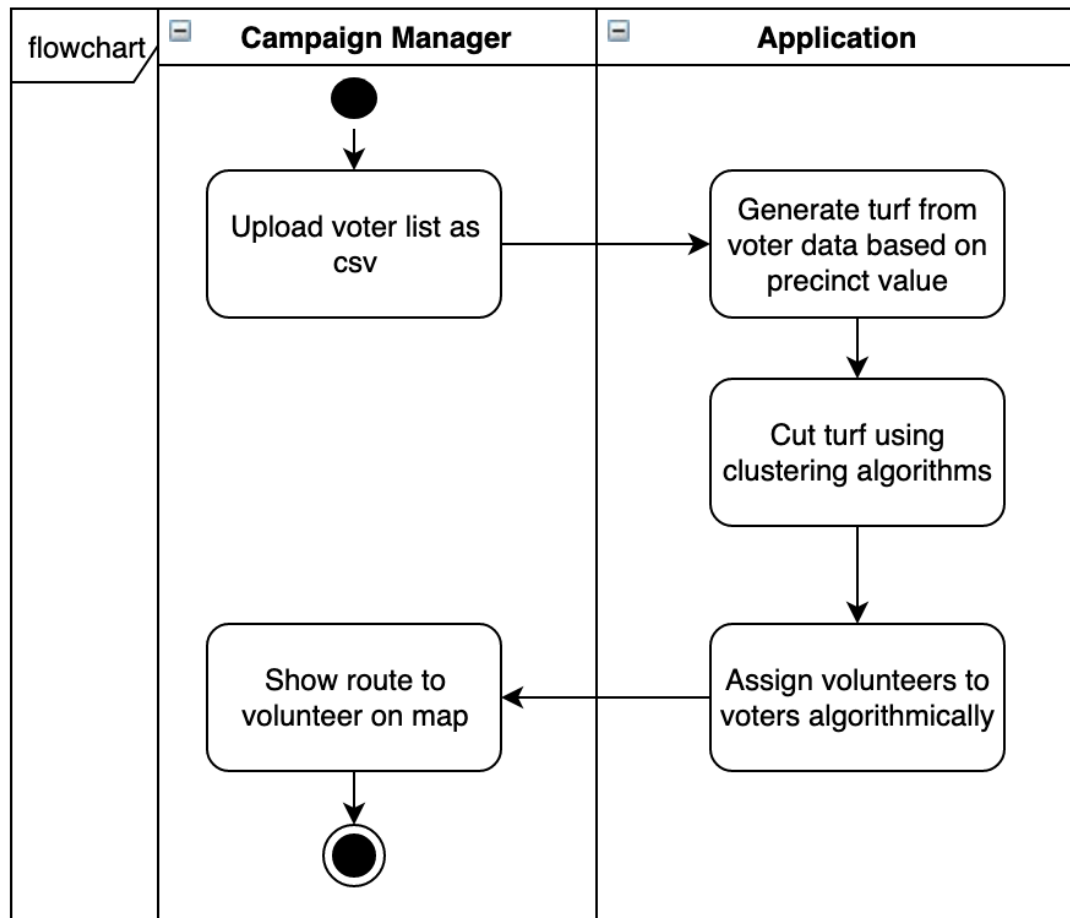
3.3.1 Element Relationship Diagram

Figure 4: Entity Relationship Diagram for Field Progress App

3.3.2 Business Workflows

3.4 Organizational and Operational Implications

3.4.1 Organizational Transformations

- *The campaign manager needed to be trained to use the new system and determine how to access the results with which volunteers associated with which turfs etc.*
- *The need to hire a maintainer/manager to send voter data through POST requests to the server.*

3.4.2 Operational Transformations

- *Field Progress Application will enable the campaign managers to automate the manual effort that goes into turf cutting and turf allocation to volunteers.*
- *Volunteers will know the efficient routes within their turf to cover all voters in their available time.*