

# FoodChain: A Decentralized Application for Restaurant Selection

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## Abstract

FoodChain is a decentralized application for selecting a restaurant to eat at among small groups of people. The application allows an organizer to create a time sensitive poll, invite people to dinner with the poll, and then view the results of attendee voting. The application is implemented using Ethereum blockchain and has a web user UI front end.

## 1 Introduction

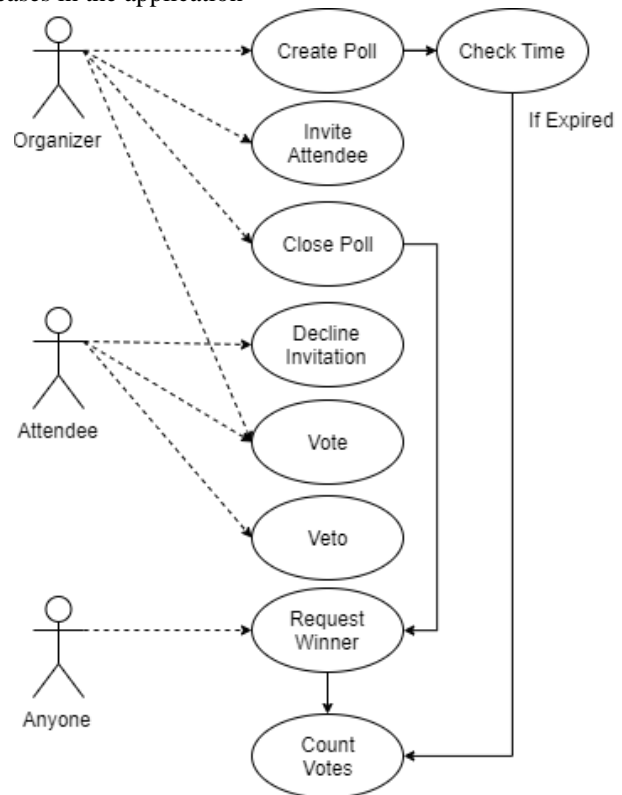
Often, groups of friends or family struggle to decide on where to go to dinner, wasting time and often resulting in a restaurant choice that leaves many individuals dissatisfied. FoodChain is designed to solve this problem by providing a decentralized application for restaurant selection that uses blockchain technology to provide a trusted and open decision making process. FoodChain allows a group organizer to create a virtual poll which is placed on the Ethereum blockchain and contains a list of potential restaurants and a time limit after which the poll closes. The organizer can then invite people they know to dinner, by authorizing them to participate in the poll. When a voter responds to the poll they can up-vote or down-vote each option and optionally veto an option. The veto option is designed for use by people with dietary restrictions who would be unable to eat at a particular location. The poll ends once the available time has elapsed or the organizer closes the poll early, at this point the most up-voted restaurant is selected.

Should time and mechanics allow, FoodChain may be extended to allow for Ranked Choice Voting (RCV) also known as simulated runoff voting. This methodology would allow voters to rank the options in terms of which they would favor most. Then when the poll closes the total votes for each are counted and the least supported option is eliminated. Votes from users who selected this option as their preferred location would then be transferred to the next option on their ranked list. This process continues until only one option remains and is beneficial as it maximizes satisfaction of all voters better than an up-vote/down-vote system would.

## 2 Use Case

### 2.1 Use Case Diagram

The following is a use case diagram for FoodChain which shows the relationships between actors and use cases in the application



### 2.2 Use Case Specifications

The following use cases are supported by this application, more may be added during the development process

**Create Poll** – The event organizer creates a dinner poll which lasts for a predefined amount of time and includes a list of unique restaurant ID's

**Invite Attendee** – The event organizer invites a guest to dinner by adding their blockchain address to the list of allowed voters

**Close Poll** – The event organizer triggers the poll to “close” meaning that further voting is no longer allowed and a winner is immediately computed

**Check Time** – A function that automatically closes the poll and computes the winner after an amount of time defined by the event organizer during creation

**Decline Invitation** – An invited attendee indicates their intent not to attend and forfeits their right to vote

**Vote** – A registered voter (organizer or attendee) up-votes, down-votes, or abstains from voting on each item. This may be replaced with RCV if possible

**Veto** – An invited attendee indicates that they would be unable to eat at a given restaurant, removing that option from the available options

**Request Winner** - Any actor requests that the current winner be computed by counting the current votes

**Count Votes** – The current number of votes is counted for each option (excluding vetoed options) and a winner is returned. The winner will be computed by the highest number of up/down votes or by instant runoff if RCV is implemented