

# Cloud Native Development with Kubernetes Workshop

Project Proposal  
By MTAPizza

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# Sympoll

## 1. Background

Sympoll is an online surveying platform engineered for optimal scalability through the utilisation of Kubernetes' advantages. The concept arose from challenges encountered while attempting to leverage the "surveys" feature on WhatsApp, where the effectiveness of surveys was consistently compromised by competing conversations within the group. This resulted in unsuccessful endeavours to gather comprehensive feedback from all group members.

## 2. What is the problem you are trying to solve?

Today, there is no all-encompassing solution for a surveying platform, leaving individuals with disparate methods for various survey needs. Whether it's voting for the local council, suggesting a surprise party idea for friends on a WhatsApp group, or conducting an academic survey through a shared Google Forms page, each scenario requires a distinct approach. Our platform aims to address this fragmentation by providing a comprehensive solution, enabling users to conduct and participate in surveys seamlessly across their diverse social circles.

## 3. Describe briefly, in high level your presumed solution

### **Solution Overview:**

Our application shines a spotlight on polling, aiming to deliver a comprehensive polling system featuring a hierarchical structure and multiple groups. Within these groups, users can take on roles ranging from simple voters to key figures with the authority to create polls, possess votes of greater significance, and even exercise veto power over decisions.

### **Implementation Highlights:**

Our software comprises a web client for user interaction, along with multiple servers dedicated to handling authentication, databases, and logic. Emphasising high scalability, the system effortlessly adapts to accommodate new features and efficiently manages heavier user workloads. Leveraging Kubernetes' self-healing and rolling updates features ensures high availability, while deployment on a cloud computing platform adds flexibility to resource utilisation.

In summary, our application not only prioritises an enriched polling experience but also demonstrates adaptability, scalability, and resilience through its thoughtfully designed architecture and deployment strategies.

## 4. Who are the expected users of the application?

Our surveying platform is designed for a diverse audience, ranging from neighbours making decisions on HOA matters, friends coordinating events and outings, to students conducting research, and corporate leaders seeking valuable feedback. We aim to streamline the surveying process across various social circles, ensuring accessibility for everyone, whether you're a community organiser, a social planner, a student, or simply someone gathering opinions from friends. Our objective is to provide a user-friendly platform that meets your survey needs, regardless of the specific context.

## 5. What will be the main features and flows of the (different) user(s)?

### Key Features:

- **High Availability** - This proactive approach minimises downtime, ensuring uninterrupted access for our users and enhancing application reliability.
- **High Scalability** - Utilising Kubernetes, our application leverages dynamic scalability and intelligent traffic distribution across multiple instances, ensuring seamless adaptation to varying user demand while optimising performance and reliability.
- **Polling System** - The core functionality of the application enables users to participate in voting processes within designated polling groups to which they belong. Each polling group encompasses multiple users, each assigned distinct roles delineated below.
- **Archive for Polls** - Each polling group has the capability to archive unused or completed polls, storing them within a dedicated section accessible within the polling group interface for later reference.
- **Notifications** - Users will receive notifications for newly created polls, important messages within the polling group, and additional updates as specified by the group leaders.
- **User Profiles** - Each user has the ability to customise their profile by adding a profile picture, and by updating personal information such as their name, email address, and phone number, among other details.
- **Public and Private Group Functionality** - Each polling group offers the option to be designated as either "Private" or "Public." Private groups require invitation-based access, while public groups are open to any registered user.

### Optional Features:

- **Advanced Security Measures (HTTPS and Reverse Proxy Configuration)** - Applying advanced security measures ensures that user data is protected and communication between the Sympoll platform and users' devices is secure.
- **Integrated Chat** - Enables users to have conversations within groups. Participants can discuss survey topics, provide feedback, and engage in interactive discussions directly within the Sympoll platform.

- **Statistical Insights** - Provides easy-to-understand data analysis tools. This feature helps users understand survey results better by showing things like response distribution, demographic breakdowns, and more.
- **Customizable Website Themes** - This feature lets you change how the Sympoll website looks. You can choose different colours and layouts to match your style or preferences.
- **Poll Observers** - Poll observers are users who can see survey information but can't vote. They're like spectators, watching without participating in the voting process.

## **User Roles:**

- **Average User:** Regular member with a single voting weight.
- **Role-Endowed User:** Ordinary members granted a role, enhancing their voting weight.
- **Moderator:** Group member with specific admin-assigned permissions, including user management and role assignments.
- **Group Leader (Admin):** Possesses full group control, with capabilities such as closing the group, modifying moderator permissions, and initiating polls.

## **User Status**

The status of an average user varies based on their group affiliation. For instance, a minister may serve as a regular member in their daughter's kindergarten group while holding a leadership role in their workplace. This dynamic status reflects the diverse roles users can embody within different groups.

## **Actors:**

### **Standard User**

The average user of the application.

#### **Actions:**

- **Vote in Polls:** Users can participate in polls by casting their votes.
- **Create Polls:** Users have the ability to create new polls for their groups.
- **Join/Leave Groups:** Users can become members of groups or opt to leave them.
- **Post Group Notifications:** Depending on their role within the group, users may post notifications.
- **Get Notifications:** Users receive notifications for new polls, group announcements, and other relevant updates.
- **Register:** New users can register for an account on the platform.
- **Log In:** Users need to login to access personalised features and participate in polls.

## Group Moderator

A group member with specific admin-assigned permissions.

Additional Actions:

- **Moderate Polls:** Group moderators have the authority to oversee and moderate polls within their group.
- **Manage User Roles:** Moderators can assign or modify roles for users within the group.
- **Resolve Issues:** Moderators are responsible for resolving conflicts or issues within the group.
- **Approve/Decline Polls:** Depending on group settings, moderators may have the authority to approve or decline polls before they go live.

## Group Leader (Admin)

Possesses full control over a group with additional capabilities.

Additional Actions:

- **Close Group:** Group leaders can close a group, restricting further activities.
- **Modify Moderator Permissions:** Leaders can adjust the permissions and capabilities of group moderators.
- **Initiate Polls:** Leaders have the ability to initiate group-wide polls.
- **Customise Group Settings:** Leaders can customise various group settings, such as privacy options and notification preferences.

## System Admin

A privileged system administrator with global control.

Additional Actions:

- **Ban/Unban Users:** System admins can impose bans on users engaging in unethical behaviour and lift those bans as necessary.
- **Suspend Users:** Temporarily suspend users for violating community guidelines or terms of service.
- **Delete Groups:** In extreme cases, system admins can delete groups with inappropriate or harmful content.
- **View Private Groups:** System admins may access private groups for moderation purposes, ensuring adherence to platform policies.

## 6. Tech stack

The technology stack for the project, designed for Kubernetes and built on a microservices architecture, is expected to be extensive and subject to potential changes.

## 7. Submission Details

**GitHub Link:**

<https://github.com/Ronenii/Sympoll>

**Workshop Website Registration Link:**

[Provide the link to the project registration on the workshop website]